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PREPARATION OF SITE AND OTHER PRELIMINARY ITEMS

◆ ◆ ◆

FOUNDATIONS

THE FOUNDATION COMPANY

120 Liberty Street
NEW YORK, N. Y.

CABLE ADDRESS
"Underfound"

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ATLANTA, GA.
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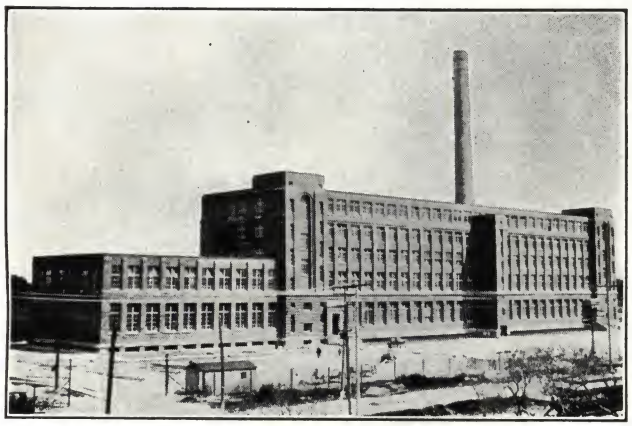
SANTIAGO, CHILE
BUENOS AIRES, ARGENTINA
MONTEVIDEO, URUGUAY

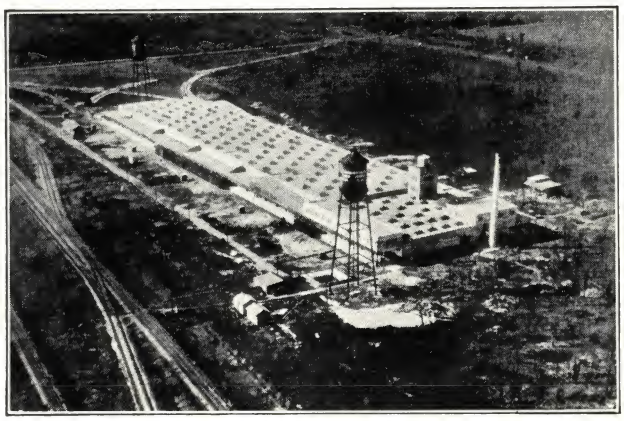
Services

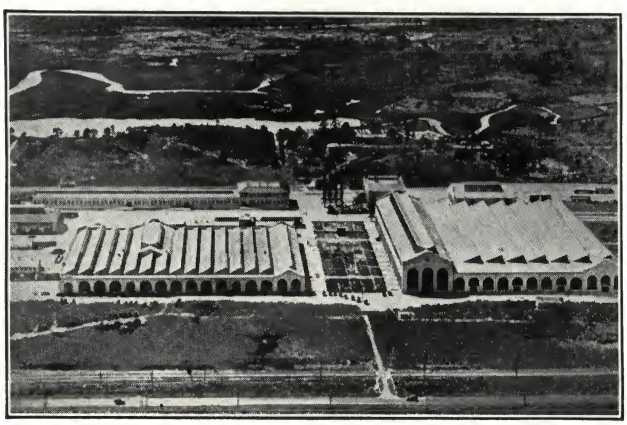
THE FOUNDATION COMPANY is an organization of Construction Engineers widely experienced in BUILDING DIFFICULT SUPERSTRUCTURES and SUBSTRUCTURES in all parts of the world. The enviable reputation gained in its early history for trustworthy underground construction followed it into the field of GENERAL CONTRACTING.

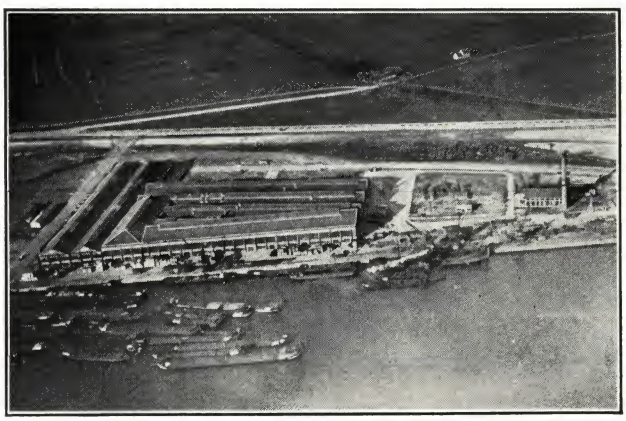
THE FOUNDATION COMPANY has built buildings of nearly every known type, such as offices, banks, stores, hotels, club houses, dwellings, and also the whole range of industrial buildings, power plants, etc. This company is successfully building warehouses, railroad terminals, filtration and sewage plants, hydro-electric developments, highways, bridges and bridge piers, mine shafts and tunnels, river and harbor developments and complete industrial projects.

As its name would indicate, THE FOUNDATION COMPANY also specializes in underpinning and foundations. Most of the skyscrapers in lower New York City rest on foundations built by this Company.









The Foundation Company, General Contractor

CONSTRUCTION SURVEY COMPANY

Quantity and Quality Analyses, Appraisals and Supervision

TELEPHONE
Caledonia 5-7317

101 Park Avenue
NEW YORK, N. Y.

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American Institute of Quantity Surveyors and New York Building Congress

SERVICES

Scope

Reports, cost data, surveys, estimates, tax valuation, arbitration and construction survey contracts on any branch of work.

Adaptability

Services are applicable to all sizes and types of construction, and may be used for contemplated, current or completed structures. They are equally useful to buyer, owner and seller of construction.

Preliminary Services

Preliminary surveys and appraisals are furnished on any branch of work from sketches and outline specifications or verbal description.

Construction Survey Contracts

The principal service of this company is the preparation of the construction survey contract, illustrated on the following specimen pages, and the supervision of such contracts in co-ordination with the designers' superintendence.

Advantages and Benefits

Improving the equity between buyer and seller creates confidence, satisfaction and economy. These factors promote, improve, and increase business.

Construction Utility

Surveys verify the plans and specifications, preventing errors in proposals and construction. They are a positive basis for proposals, contracts, purchasing, cost accounting, comparison of bids, verification and adjustment of items and arbitration.

Comparison of Items and Costs

The survey reveals the exact quantity, quality and price of each part of the structure. The transaction is fully recorded and open for examination at all times. Under this method the cost of any item may be compared with another for economy as well as for the cost of the same item by different bidders.

Final Cost Assurance

The actual cost is determined precisely as every survey contract is supported by a preliminary survey and appraisal prepared by the surveyor in addition to the bidders' proposals based on a final survey.

Awarding Contracts Without Delay

Surveys are prepared with sufficient speed so that the process of receiving bids is not delayed. When it is desirable to award contracts before the completion of the entire design, construction can be speeded by awarding portions of the work in advance on the basis of partial surveys without risk. Time is also saved by not having to wait on subcontractors' bids.

Future Reference Records

Surveys are permanent records available for arbitration, investigation and evaluation for any purpose.

Financial Risk Reduced

Bonding is less essential as a detailed survey and appraisal lessens the financial risk of buyer and seller.

Wasteful Duplication Eliminated

A professional survey eliminates the wasteful duplication of surveying for bidding purposes, the overlapping of items, excessive alternate bids and blueprints.

Economy

The conservation of material and labor due to elimination of waste and the increase of efficiency reduces the cost and increases the appearance, utility, and permanence of the structure 3% to 10%.

Applicable on Any Form of Contract

Surveys are used on Lump Sum, Cost Plus Fee, or Unit Price Contract.

How, When and Why Issued

Surveys are prepared in accordance with the plans and specifications prior to receipt of proposals, and are furnished to all bidders as a definite instrument of purchase or utilized for other purposes mentioned.

How Services Are Available

Services are sold at lump price, hourly rate, or percentage fee; paid for directly, incorporated in the designer's fee, or specified to be paid for by the seller of construction. Unlimited service is available on monthly or yearly subscription basis.

Guarantee Essence of Contract

Inasmuch as all the proposals and contracts are based on the same quantity and quality of items at a specific price for each item, every charge or credit is verified, certified and justified. Therefore, neither buyer nor seller can lose in this form of transaction.

Universal System

Uniform measurement and tabulation, plus scientific terminology, facilitate the use of our surveys anywhere, regardless of local prices or trade customs, etc. Every item is reference lettered and numbered for quick identification with design.

Recommendation

Indorsed by the American Institute of Architects, Associated General Contractors of America, American Engineering Council and leading architects, engineers, and builders.

References

List of clientele and projects in connection with which our services have been used is available.

Facilities

We employ only scientifically trained surveyors, as well as the most efficient measuring, tabulating and calculating methods and equipment. They are used in sufficient quantity under good working conditions.

Establishment and Experience

This company is the largest and most scientific organization of its kind, established in 1922 by G. Szmak, Construction Economist and Manager. We have surveyed and appraised over 1500 projects valued at approximately $200,000,000.

Further Information

In making inquiries state kind of service required, time limit, name of project, type, location, its size and name of designer.

Prices and sample surveys, appraisals, and survey contract documents furnished on request to offices or associates.

The following pages illustrate the survey contract documents.

SPECIFICATION OF SURVEY PROPOSAL

(ACCOMPANYING DESIGNER'S PLANS AND SPECIFICATIONS ON UNIT PRICE CONTRACT)

INSTRUCTIONS TO BIDDERS

Instrument of Purchase — The basis of this purchase is a construction survey, which shall be an integral part of the contract documents.

Definition — A construction survey is the scientific analysis of the parts for assuring the economic value of the structure.

Method of Analysis — The quantity and quality of each item is measured and tabulated as drawn and specified, or as it physically exists in the structure.

Form of Proposal on Unit Price Contract — The survey is furnished in duplicate to each bidder and one copy shall be submitted as the formal proposal. The bidder shall insert a separate direct unit rate for material and labor opposite each item of the survey and a definite percentage or sum fee for indirect material and labor cost. This fee is to include the general condition, survey, insurance and surety specified, plus management and profit.

Adjustment — Items added or increased, subtracted or decreased for any reason shall be paid for or eliminated at the quoted price rates. Operation shall not commence on any item without a proposal.

Function of Surveyor

(a) The surveyor shall furnish the designer with preliminary cost data, surveys and appraisals.
(b) Verify the drawings and specifications against error and omission affecting the cost of structure.
(c) Prepare the survey in the required number of copies.
(d) Oversee and tabulate the proposals.
(e) Supervise and adjust the difference in quantity, quality and price of items as the construction progresses.

Payment for Survey — Each bidder shall include the specified percentage or sum fee for the construction survey as part of the indirect cost. The awarded bidder shall pay this amount to the surveyor within 10 days after execution of the contract agreement and shall also pay at the same rate on increases in the cost of work within 10 days after completion of all work.

Rights of Purchaser — The purchaser reserves the right to add or subtract items, increase or decrease the quantity, or quality of items, or to reject any or all bids, or to accept any bid.

Information — Further information concerning the details of survey proposal will be furnished by the surveyor upon request. The contractor is furnished a record of the measurement and tabulation of items for expediting payment requisitions.

Note: Specification of survey proposal on lump sum and cost plus fee contracts is modified. See **notation** on illustration of Formal Survey Proposal.

FORMAL SURVEY PROPOSAL

(FURNISHED TO BIDDERS AND SUBMITTED BY THE BIDDERS ON UNIT PRICE CONTRACTS)

Note: 1. On Lump Sum Contracts, the bidders are furnished the Formal Survey Proposal, with or without an appraisal. The bidders shall insert a definite lump sum fee for total indirect material and labor cost.

Note: 2. On Cost Plus Fee Contracts, a similar form is furnished, and the bidders shall insert a definite percentage fee.

SPECIFIC DIVISION AND DIVISION NUMBER

PURCHASER Construction Buyer or Owner
PROJECT Any Size or Type
LOCATION Any Place
DESIGNER Construction Design Co.

BIDDER Construction Management Co.
SERVICE Manage the Erection of
SUMMARY Items, Various Trades
QUOTATION Sum, Fee, or Unit Price

	ITEM	MATERIAL	LABOR	PRODUCT	QUANTITY	√	RATE	MATERIAL COST	√	RATE	LABOR COST	√
1	A1	Earth	5'6"Bsmt.	Exc.andDisp.	750 S		.06	45 --		.06	45 --	
2	A2	"	2' Wall	" "	1375 S		-----	--- --		.10	137 50	
3	A3	Exc. Mat'r'l	1' "	Fill	3450 S		-----	--- --		.02	69 --	
4	B1	1:3:5 Conc.	12" Found.	Wall	1460 S		.30	438 --		.22	321 20	
5	B2	" "	2'sq.Col.	Piers	400 L		1.35	540 --		1.00	400 --	
6	B3	" "	2'x6" Wall	Pilasters	175 L		.20	35 --		.25	43 75	
7	B4	" "	4" Floor	Slab On Gr.	4570 S		.08	365 60		.03	137 10	
8	B5	1:2 "	1" "	Finish	3450 S		.05	172 50		.05	172 50	
9	C1	Com. Brick	12" Int.	Walls	11350 S		.35	3 972 50		.35	3 972 50	
10	C2	$35.Fa. "	4" Flemish	Veneer	5800 S		.30	1 740 --		.30	1 740 --	
11	C3	Terra Cotta	6" Int.	Partitions	2400 S		.18	432 --		.10	240 --	
12	D1	Local Stone	16" Found.	Walls	1200 S		.25	300 --		.25	300 --	
13	D2	Bluestone	2" Terrace	Flagging	1500 S		.40	600 --		.25	375 --	
14	D3	Granite	4"x8" Wdw.	Sills	100 L		2.00	200 --		.30	30 --	
15	E1	Metal	Wall	Lath	14625 S		.03	438 75		.02	292 50	
16	E2	P.C.Plaster	2C. Ceil.	Finish	7150 S		.04	286 --		.05	357 50	
17	E3	Adamant "	3C. Wall	"	16040 S		.05	802 --		.06	962 40	
18	F1	$2.Marble	6'x3'xl"	Hearth Fin.	1 U		36.00	36 --		9.00	9 --	
19	F2	Matt.Cera.	½" Wains.	Tile "	425 S		.55	233 75		.35	148 75	
20	G1	2"x8" Spr.	16"cc.Fl.	Joists	2540 S		.045	114 30		.025	63 50	
21	G2	8"x12"Y.P.	Fl. Joist	Girder	150 L		.50	75 --		.20	30 --	
22	G3	2"x4" Spr.	16"cc.Part	Studs	3400 S		.04	136 --		.04	136 --	
23	G4	1"x6"N.C.P.	Diag. Fl.	Lining	6270 S		.045	282 15		.02	125 40	
24	H1	1¾"Bir.Ven.	3'x7'Int.	No. 32 Door	25 U		15.--	375 --		6.00	150 --	
25	H2	1½"W.P.& Gl.	4'x6'D.H.	No. 47 Sash	16 U		12.--	192 --		4.00	64 --	
26	H3	Birch & Gl.	20'x9'xl'	No. 7 Bkcase	1 U		150.	150 --		15.--	15 --	
27	H4	W.P.Special	1" Wall	Pan. Fin.	675 S		.75	506 25		.25	168 75	
28	H5	Oak	1"x6"	Base	1650 L		.15	247 50		.05	82 50	
29	I1	Aluminum	3'x5' Wdw.	No.21 Screen	30 U		6.00	180 --		2.00	60 --	
30	I2	Bronze	3"x4" Door	No. 6 Butts	20 U		.50	10 --		.35	7 --	
31	I3	Aluminum	No. 32 "	Weatherstrip	1 U		3.00	3 --		1.00	1 --	
32	J1	Linoleum	¼" Floor	Finish	1475 S		.25	368 75		.05	73 75	
33	J2	Sel. Oak	1" "	"	1830 S		.20	366 --		.05	91 50	
34	K1	Green Slate	¼" Roof	Finish	7500 S		.25	1 875 --		.10	750 --	
35	K2	16 oz.Copper	16" Wall	Flashing	260 L		.40	104 --		.15	39 --	
36	K3	4" Cast Iron	4' Leader	Boots	20 U		4.00	80 --		1.50	30 --	
37	L1	Wrought Iron	24" Stair	Railing	40 L		3.00	120 --		2.00	80 --	
38	L2	38.5 lb.Steel	I. Floor	No. 3 Beam	35 L		1.50	52 50		.60	21 --	
39	M1	Kalamein	3'x7' Int.	No. 10 Doors	2 U		35.--	70 --		15.--	30 --	
40	M2	Holl. Metal	6"xl" Wdw.	Sill	75 L		.40	30 --		.10	7 50	
41	N1	St'd Wr. Ir.	1½" Steam	Supply Line	250 L		.20	50 --		.10	25 --	
42	N2	Brass	No. 623	Radiators	16 U		15.--	240 --		5.00	80 --	
43	O1	Lead and Oil	3C. Wall	Finish	3670 S		.02	73 40		.03	110 10	
44	O2	Shelland Var.	2C. Floor	"	940 S		.02	18 80		.02	18 80	
45	P1	Obs. Glass	12x8 Sash	Panes	675 U		.30	202 50		.10	67 50	
46	TOTAL	MATERIAL	DIRECT	COST				16 559 25			12 081 00	
47	"	LABOR	"	"				12 081 00				
48	"	DIRECT	MATRL. AND LAB'R	"				28 640 25				
49	"	INDIRECT	MATRL. AND LAB'R	"			15%	4 296 40				
50	"	DIRECT AND IND.	CONSTRUCTION	"			TOTAL	32 936 29				
	"	DIVISION	CUBAGE AND	" RATE	32940 C		$1.00					

S—SQUARE FEET L+LINEAR FEET U±UNITS C=CUBIC FEET LC—LESSER COST AC+ADDITIONAL COST IC±INDEFINITE COST

SURVEY CONTRACT AGREEMENT

(BETWEEN CONSTRUCTION BUYER AND SELLER ON UNIT PRICE CONTRACT)

ACCEPTANCE

CONFIRMATION THAT, the General Contractor Co., of New York, N. Y., the Seller, agrees to manage the erection of items written or drawn in the contract documents of the Investment Building, at New York, New York for the prices quoted in an itemized survey proposal herewith, dated the Twenty-first day of February, A. D. 1930.

AND

IN CONSIDERATION THEREOF, the Investment Co., of New York, New York, the Buyer, agrees to pay the Seller on or about the 15th day of each following month the quoted prices for the items erected in the structure during the preceding month upon a requisition verified by the Surveyor and certified by the Designer.

DOCUMENTS

THE EXECUTION OF THIS AGREEMENT is based upon the hereinafter enumerated contract documents:—

(a) Construction Survey, pages dated;	1-10 inclusive;	Feb. 1, 1930
(b) Drawings, numbers dated;	1-8 " ;	Jan. 20, "
(c) Specifications, pages dated;	1-40 " ;	" " "
(d) Revisions, numbers dated;	8-10 " ;	" 25, "
(e) Supplements, pages dated;	41-45 " ;	" " "

AND

THE SELLER AND BUYER for themselves, their heirs, successors, administrators, executors, and assigns hereby agree to the full performance of the covenants herein contained.

EXECUTION

IN WITNESS WHEREOF they have executed this agreement on the 21st. day of February A. D. 1930 at New York, N. Y.

Witness Construction Survey Co.	Seller General Contractor Co. [Seal]
By John Roe Title Sec.	By Richard Roe Title Pres.
Witness Structural Design Co.	Buyer Investment Co. [Seal]
By William Doe Title V. P.	By John Doe Title Pres.

State of New York }
County of New York } ss.

On the 21st day of February in the year 1930 at New York, N. Y. before me personally came Richard Roe and John Doe on behalf of General Contractor Co. and Investment Co. respectively, to me known, who, being by me duly sworn, did depose and say that they reside in New York, N. Y.; that they are the Presidents of General Contractor Co. and Investment Co. respectively, the corporations described in and which executed the above instrument; that they know the seals of said corporations; that the seals affixed to said instrument are such corporate seals; that they were so affixed by order of the Boards of Directors of the respective corporations, and that they signed their names thereto by like order.

(Seal)

John Jones
Notary Public, N.Y. County.

ROBERT W. HUNT COMPANY

Engineers

Inspection and Tests of Materials for Buildings and Structures

GENERAL OFFICES AND LABORATORIES
22nd Floor, Insurance Exchange
CHICAGO, ILL.

NEW YORK, N. Y.
BIRMINGHAM, ALA.
KANSAS CITY, MO.
SEATTLE, WASH.
PITTSBURGH, PA.
DALLAS, TEX.
PHILADELPHIA, PA.
PORTLAND, ORE.
LONDON, ENGLAND
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HOUSTON, TEX.
JACKSONVILLE, FLA.
VANCOUVER, B. C.
MONTREAL, QUE.
SAN FRANCISCO, CAL.
NEW ORLEANS, LA.
LOS ANGELES, CAL.
TORONTO, ONT.

Cement and Concrete Inspection

Cement is sampled on the Hunt Individual Sample Basis in car load or bin lots at the mills or warehouses or when delivered on the work, each lot being identified with serially numbered blue tags. These samples are tested in accordance with American Society for Testing Materials requirements or as specified.

Concrete aggregates are analyzed to determine suitability for construction purposes.

Concrete cylinders are cast to check the designed mix, to determine the quality of concrete and for job control to assure safety in the removal of forms and economy in their use.

Supervision during construction of reinforced concrete, mass concrete and fireproof concrete structures includes analysis of concrete materials and the design of the concrete mix, check of the mixing operations, checking the alignment and construction of forms and the proper placing of reinforcements and supervision of the curing of concrete under abnormal weather conditions.

Special tests and investigations to determine permissible loads on floor panels and individual concrete members.

Concrete failures investigated to determine the cause of failure and recommend corrections.

Structural Steel Inspection

Inspection of structural material at the mills and foundries, including identification and witnessing of physical tests.

Supervision and inspection of workmanship, checking the sections, dimensions and detail connections during fabrication at the shops, insuring the proper handling of material, first class workmanship, accurate construction, thorough painting and distinct marking, thus facilitating erection at the site.

Supervision and detail inspection of the structure during erection.

Welding of structural materials inspected in detail at the fabricating plant and during erection of the structure. Our laboratories are equipped for procedure control of welders.

Reinforcing steel is inspected and tested at mill or warehouse as required and tagged for identification.

Estimation of weights from detail drawings, and checking shipped weights of finished work.

Bank vault materials and workmanship inspected and tested at the several points of manufacture and the installation at the building carefully supervised to assure proper assembly and satisfactory operation.

THE STAMP OF QUALITY
H
HUNT
ENGINEERS
INSPECTION – TESTS
SUPERVISION
RESEARCH

Specification Forms

Structural Steel—Shall be tested and inspected at the mill, fabricating shop, and during erection.

Reinforcing Steel—Shall be tested and inspected at the mill or warehouse before shipment to the site.

Cement—Portland cement shall conform to the latest Standard Specifications and tests for Portland Cement of the American Society for Testing Materials. Tests shall be made on individual samples. Bags sampled to be tagged for identification.

Aggregates—The Testing Engineer shall run sieve, decantation and organic tests on both fine and coarse aggregate after the material has been delivered to the job and as often as, in his opinion, it is necessary so to do to control the concrete.

Placing of Concrete—The Testing Engineer shall be present at all times during the mixing and placing of concrete; he shall be in direct control of its quality and shall be responsible directly to the architect, or whomever he may designate.

Testing Engineer—Wherever testing and inspection of materials and [or] supervision of construction is mentioned in these Specifications, it is understood that the work is to be performed by the ROBERT W. HUNT COMPANY, who are hereby appointed for this service.

Laboratories

Cement, Concrete, Physical, Chemical and Metallurgical Laboratories complete in personnel and apparatus are maintained at convenient points in relation to the principal manufacturing centers of the United States, Canada, England and Continental Europe for tests, check analysis, research or special investigations of all engineering materials.

General Engineering

Consultation in the various fields of engineering: Mechanical, Civil, Hydraulic, Chemical, Metallurgical and Mineral Industries.

Research on building materials.

Soil tests and test borings to determine the areas of foundations, permissible loads per square foot and the probable ultimate settlement under load, based on an engineering analysis of these tests and borings to assure uniform settlement of structure.

Investigations and tests to determine the existing condition and safety of both old and new structures.

Efficiency, capacity and economy tests of engines, boilers, pumps, compressors and other mechanical equipment.

ESTABLISHED 1881

PITTSBURGH TESTING LABORATORY

Engineers and Chemists

PITTSBURGH, PA.

BRANCH OFFICES

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HOUSTON, TEX.
ST. LOUIS, MO.
MILWAUKEE, WIS.
NEW ORLEANS, LA.
NEW YORK, N. Y.
TAMPA, FLA.

ASSOCIATED COMPANIES

SMITH, EMERY & COMPANY, 651 Howard Street, San Francisco, Calif.
SMITH-EMERY COMPANY, 920 Santee Street, Los Angeles, Calif.
NORTHWEST TESTING LABORATORIES, 390 Burnside Street, Portland, Ore.
NORTHWEST TESTING LABORATORIES, 2113 Third Avenue, Seattle, Wash.
CANADIAN INSPECTION & TESTING COMPANY, Shaughnessy Building, Montreal, Que.
CANADIAN INSPECTION & TESTING COMPANY, 100 Jarvis Street, Toronto, Ont.
KANSAS CITY TESTING LABORATORIES, 700 Baltimore Avenue, Kansas City, Mo.

Pittsburgh Testing Laboratory Service

To safeguard the interests of architects, engineers and owners, and to facilitate the work of contractors, this company renders Complete and Reliable Testing, Inspection and Verification Services covering all types of Buildings and Building Materials. Trained field and and laboratory personnel and adequate modern facilities produce thorough and intelligent performance of this work in accordance with established standards. Costs are charged in direct proportion to the required work and necessarily are not subject to competitive price-cutting.

Inspection Service

Steel Buildings—***Mill Inspection***—Inspection and tests in the mills embrace prescribed physical and chemical tests, checks for surface, section and gage. Detailed reports furnished with each shipment.

Shop Inspection—Includes examination of laying-out, punching, riveting, reaming, machining, assembling, checking of field connections and painting. Detailed progress reports are made with shipping weights.

Welding Inspection—Embraces examination of laying-out, edge preparation, spread of joint, clamping, shrinkage, depth of penetration, check of dimensions and check by procedure control on qualification of welders.

Erection Inspection—Made during erection, includes supervision of the placing of steel, alignment of columns, field riveting and painting.

Concrete Buildings—***Cement Testing***—Samples taken by us from bins and cars at the mill. Tests made in our own laboratories located in principal cement producing centers. Standard A.S.T.M. methods, equipment and laboratory control. Bin tested cement available at most mills.

Aggregates—Investigation, test and report as to suitability, in accordance with standard requirements of gravel, stone, slag, sand, etc.

Reinforcement—Inspection and test for section and quality at mill or warehouse.

Supervision—Inspection on the job. Control of mixing and placing, slump tests and water cement ratio. Inspection of forms. Protection against low and high temperatures. Test specimens poured on job and sent to laboratory. Load tests on finished structures.

Examination of Failures—Competent and experienced engineering service to determine cause and suggest remedy, if feasible.

Preserved Lumber—***Inspection Before Treatment***—Examination for kind, dimensions, heart, sap, grain, knots, insect damage, other defects, and finish.

Inspection of Treatment—Preservative is analyzed and checked with specifications. Quantity of preservative required, pressures, temperatures, gages and quantity of oil injected are carefully checked. Borings are made to determine depth of penetration.

Inspection After Treatment—All lumber is examined after removal from the treating tanks for shakes, splits and warp, or other defects due to treating process or which may be aggravated by it.

Verification of Quality

Physical, chemical, or electrical tests are made to determine relative performance and quality of any product or material, or any group of competing products when architects or engineers desire to maintain their specified standards or to establish definite standards to which materials must conform.

Certification of Quality or Performance

Progressive manufacturers may have their products tested and inspected by the PITTSBURGH TESTING LABORATORY to establish impartially their grade or performance characteristics. To products so inspected, the laboratory attaches a certification tag similar to the specimen illustrated.

Inspection Clauses for Architects' Specifications

Since the function of this testing and inspection service is to protect the architect and owner against sub-standard materials or workmanship, the architect should definitely appoint the inspection laboratory or company without option to the contractor or manufacturer. The following clauses should be incorporated in the general conditions of specifications:

"**Inspection and Tests**—All laboratory, mill, shop, and field inspections called for in other divisions of this specification shall be made by (Insert Name of Inspecting Laboratory), and all reports thereof shall be delivered to the architect. The contractor shall incorporate in his proposal an allowance of (state amount) to cover the costs of these independent inspections and tests. These sums shall be expended at the architect's discretion; any unexpended balance shall revert to the owner and any additional costs incurred at the architect's order shall be paid by the owner."

MacARTHUR CONCRETE PILE CORPORATION

19 West 44th Street, NEW YORK, N. Y.

BRANCH OFFICES

BOSTON, MASS., 101 Tremont Street
BUFFALO, N. Y., 227 15th Street
CHICAGO, ILL., 134 North La Salle Street
CLEVELAND, OHIO, 868 Rockefeller Building
DETROIT, MICH., 431 Howard Street
NEW ORLEANS, LA., 325 North Cortez Street
PHILADELPHIA, PA., 4807 Locust Street
PITTSBURGH, PA., Union Trust Building
SOUTH JACKSONVILLE, FLA., 314 Colombo Street
WASHINGTON, D. C., 1417 I Street, N. W.

CANADIAN MacARTHUR CONCRETE PILE CO., LTD., New Birks Building, MONTREAL, QUE.

"A Special Pile for Every Condition—Not One Pile for All Conditions"

The MacArthur Method employs *"A Special Pile for Every Condition—Not One Pile for All Conditions"* but the method of forming each type is such that all can be placed with our standard equipment. Therefore, when unexpected subsoil conditions are encountered and a change in plans becomes suddenly necessary, there is no delay incidental to bringing in equipment for special piles, as the equipment is already on the site and all material used is available locally.

MacArthur Concrete Piles are all cast-in-place piles and are all of the straight shaft type. They include:

Straight Shaft and Pedestal Piles—These are our standard uncased compressed concrete piles. Used for all ordinary soil conditions where piles up to 40 ft. in length are required.

Composite Piles of Cased Concrete and Timber—For use where bottom (timber) section of pile is below permanent water level. More economical than all-concrete. Placed in lengths up to 100 ft.

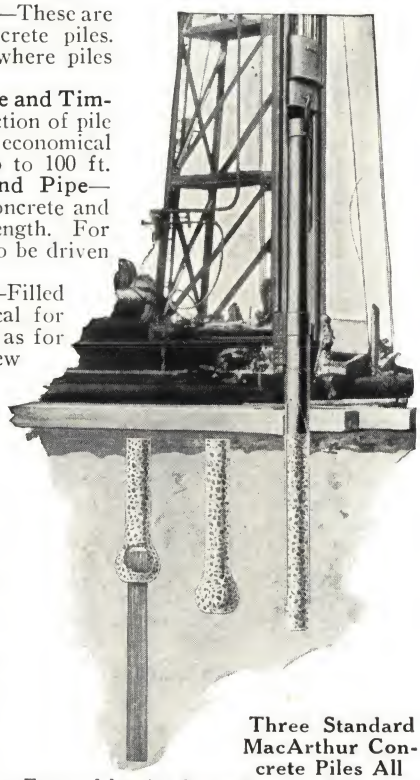
Composite Piles of Concrete and Pipe—Uncased upper section of compressed concrete and lower section of closed end pipe—any length. For use in very soft soils where piles have to be driven to great depths.

Pipe Piles with Cast Steel Point—Filled with concrete to any length. Economical for driving where headroom is limited, such as for underpinning foundations or making new foundations inside existing buildings.

Concrete Slabs for Gas Holders—We have built hundreds of complete foundations (piling and slabs) for gas holders and oil storage tanks. Our experience in this work is a very valuable asset.

Straight Shaft Uncased Compressed Concrete Piles for All Ordinary Soil Conditions

Maximum Skin Friction—The MacArthur uncased pile calls for a workable dry mix concrete compressed under a weight of 7 tons after concrete is poured. This forces a dense, homogenous concrete into intimate contact with surrounding soil and gives maximum skin friction with earth.



Three Standard MacArthur Concrete Piles All Formed by the Same Standard Driving Apparatus

The compressed concrete is so much denser than the surrounding soil that it cannot be disturbed, distorted or forced out of place by the driving of adjacent piles, as might be the case with a wet uncompacted concrete even though enclosed by a thin metallic casing.

Perfect piles are formed on 2 ft. 6-in. centers in the toughest and most rubbery of clays by this method. Large numbers of excavated piles have proven the certainty of this method.

Uniform Diameter—The MacArthur Method for uncased compressed concrete piles employs a steel driving shell with walls ½ in. thick and of uniform diameter throughout its entire length. There is no question, when this is driven to penetration, about the shell being intact and absolutely true in diameter throughout while the concrete is being placed. It also makes a pile as strong at the base as it is at the top—a pile with twice the diameter at the base as the ordinary tapered form of pile and with more concrete in each pile.

Concrete Easily Rammed or Compressed—It is a known fact that has been demonstrated by years of practice that concrete should be rammed or compressed after being placed in the forms, so as to secure perfect cohesion and to remove voids caused during pouring.

The MacArthur Method calls for a concrete compressed under a weight of 7 tons in each pile, after the concrete is placed.

"Dry Mix" Concrete Recommended for Cast-in-place Piles—In a cast-in-place pile it is necessary to dump the concrete down a steel shell a considerable distance. Therefore when a wet sloppy mix is used, the sand, cement, water and stone will undoubtedly separate and the chance of the aggregates again arranging themselves in correct proportion when they arrive at their destination is very remote indeed.

The MacArthur Method calls for a water ratio of 6 gal. of water per bag of cement with sufficient coarse aggregates to make what is termed a "dry mix."

Note: See recommendations of Portland Cement Association in their booklet "Design and Control of Concrete Mixtures."

Section of MacArthur Concrete Pile

This slab sliced from a typical standard MacArthur Pile shows a perfect dispersion of aggregate. Good solid concrete—no unfilled interstices. The right mix, compressed, assures sturdy concrete piles

Milwaukee County Courthouse, Milwaukee, Wis.

ALBERT RANDOLPH ROSS, Architect

We Saved Milwaukee County $73,000 on This Courthouse

When our bid was lowest by $73,000, we were asked to drive test piles, with the result that we won this 6,700 pile contract. The job was properly completed on time to the entire satisfaction of the architect

Goodyear Zeppelin Corporation Airship Factory and Dock

WILBUR WATSON & ASSOCIATES, Architects and Engineers

Demonstrated merit won this contract for us

Only time-tried materials and methods could be considered for such a structure. During the past 20 years the dependability of piles produced by the MacArthur Method has been proven to the satisfaction of engineers

Open Specifications for Cast-in-place Concrete Piles

(For Incorporation in Architect's and Engineer's General Specifications)

Concrete Pile Construction—Concrete piles shall be provided where shown and called for on plans. The price shall be calculated on the basis of .... lineal feet each. Contractors shall state plus and minus price per pile and per lineal foot for actual length driven.

Concrete piles shall be driven to a bearing value as determined by the Engineering-News Formula and if necessary, in the judgment of the architect or engineer, load tests shall be made on (one or more) piles, at the expense of the owner. The total settlement of pile shall not exceed one one-hundredth of an inch per ton of test load applied.

Concrete piles cast-in-place may be straight shaft or tapered. The working load on each pile shall be .... pounds. Piles shall be cast in strong removable steel shells, or light gauge steel reinforced, or corrugated, or plain shells to remain in place.

After the shell has been driven and the driving mandrel withdrawn, the shell shall be tested against collapse or squeezing of the shell out of true shape by again dropping the full sized mandrel to the bottom of the shell. Any shell which is improperly driven, is broken, shows partial collapse, is out of round or otherwise defective shall not be accepted.

Note: In the removable shell type the concrete shall be constantly compressed while the shell is being withdrawn.

Concrete—Concrete shall be mixed in the proportion of 1 part of cement, 3 parts of sand and 5 parts of stone or gravel, all as approved. A water ratio of 6 gal. per bag of cement shall be used as closely as possible so as to obtain a dry enough mix to keep the component parts of the concrete from separating while being poured into the shell. A wet, sloppy mix of concrete shall not be allowed. The concrete shall be tamped as it is being deposited or compressed after it is deposited.

Borings—(State hereafter information on and instructions regarding soil samples and boring diagrams).

Special Notes and Engineering Information on Cast-in-place Concrete Piles

Engineering-News Formula—

$$L = \frac{2\,W\,H}{S + 0.1}$$

L = Load in pounds
W = Weight of falling parts in pounds
H = Drop in feet of falling parts
S = Final penetration per blow in inches

A No. 1 steam hammer has a weight of 5000 lb. falling 36 inches.

Pile Length—It is necessary to adopt in the specification a length of pile so as to secure uniformity in the bids. This length can be determined approximately from examination of the borings. (We will be glad to make recommendations covering correct bid length upon receipt of boring data.)

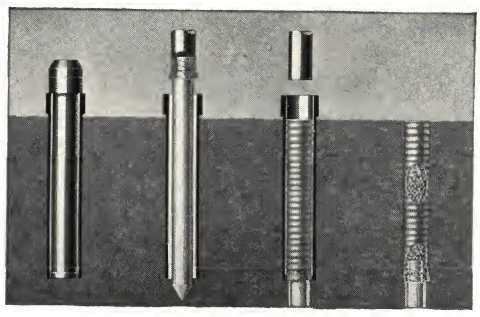
Driving Piles on Standard Centers—A condition is seldom met where the driving of cast-in-place concrete piles on 2 ft. 6-in. centers injures the pile previously driven. If unusual soil conditions are found it should be treated as a special case, rather than needlessly adding to the cost of the operation by arbitrarily specifying piles to be driven in scattered formation, which makes necessary considerable increased cost to the owner. The following is suggested for taking care of this case:

"If it is found that driving adjacent pile disturbs the pile which has just been completed, the engineers [architects] may require the contractor to deviate from the regular driving method, so as to avoid injury to piles already in place."

Pedestal Piles—It is sometimes found that there is a firm stratum of soil lying between layers of poor soil which would sustain the superimposed load if it could be properly distributed by a larger base than is possible with standard diameter piles, thereby making a desirable saving in pile length. Also, in some cases the foot of the concrete pile rests on an inclined rock, which tends to cause a side slip of the pile. The addition of a pedestal overcomes this danger by giving a larger end bearing and more intimate bond.

Reinforced Piles—Piles may be reinforced with single central rod or with a hooped cage without delay in driving operations. When so reinforced these piles may be used to withstand uplift (43-ton test load has been withstood without movement). This is valuable to resist overturning movement due to wind, or to reduce cantilever action.

Metal Shoe—In wet or semifluid soils pile forming casing is sealed before driving with a suitable metal shoe.



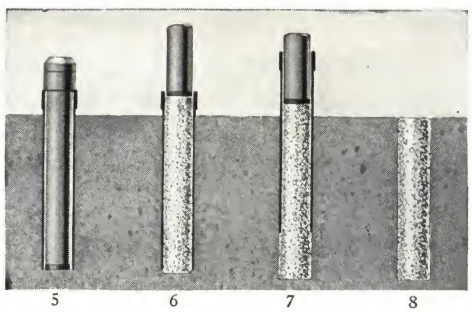
1 2 3 4

MacArthur Composite Type (Cased Concrete and Wood Pile)

(1) Core and casing driven into ground.
(2) Core withdrawn and timber, with pan on shoulder, placed in casing.
(3) Timber guided by casing, driven down to give necessary bearing. Butt of timber below ground water level. Core withdrawn and permanent shell inserted through casing and locked to timber and pan.
(4) Casing withdrawn and concrete deposited in permanent corrugated shell.

References

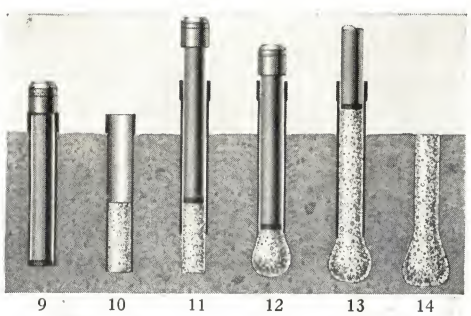
Bartlett-Hayward Co., Baltimore, Md.
The H. K. Ferguson Co., Cleveland, Ohio
William Higginson, New York, N. Y.
D. X. Murphy & Bro., Louisville, Ky.
B. H. Davis & Co., New York, N. Y.
Willys-Overland Co., Toledo, Ohio
A. Burton Cohen, New York, N. Y.
Ford, Bacon & Davis, New York, N. Y.
Mills, Rhines, Bellman & Nordhoff, Toledo, Ohio
Brooklyn Union Gas Co., Brooklyn, N. Y.
Stevens & Wood, New York, N. Y.
Electric Management & Engineering Corp., New York, N. Y.
National Tube Co., McKeesport, Pa.



5 6 7 8

MacArthur Compressed Concrete Straight Shaft Type

(5) Core and casing driven into ground.
(6) Core removed and casing filled with concrete a sufficient amount above grade to take care of compression. The 7-ton weight of the core and hammer is then placed on the concrete.
(7) The casing is steadily withdrawn from the ground—the 7-ton weight of the core and steam hammer remaining constantly on the concrete and forcing it into the space occupied by the casing and any voids in the ground.
(8) The finished cylindrical shaft—a solid homogeneous mass of compressed concrete.



9 10 11 12 13 14

MacArthur Compressed Concrete Pedestal Type

(9) Core and casing driven into ground.
(10) Core removed, charge of concrete dropped to bottom of casing.
(11) Casing pulled up 18 in. to 3 ft. with 7-ton pressure of core and steam hammer remaining on concrete.
(12) Charge of concrete rammed out.
(13) Core is removed, casing filled with concrete. Core replaced and casing steadily withdrawn while concrete is under 7-ton pressure.
(14) Finished shaft with enlarged base.

RAYMOND CONCRETE PILE COMPANY

Concrete Piles and Special Concrete Work

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NEW YORK, N. Y.

111 West Monroe Street
CHICAGO, ILL.

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DETROIT, MICH., 107 Clifford Street
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ST. PAUL, MINN., 152-60 E. 6th Street
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SEATTLE, WASH., 4th and Union Streets
WASHINGTON, D. C., 912 17th Street

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PANAMA CITY, R. P., Apartado 425
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PALEMBANG, SUMATRA

Products

RAYMOND CAST-IN-PLACE CONCRETE PILES.
RAYMOND PRE-CAST CONCRETE PILES.
RAYMOND COMPOSITE PILES (Concrete-Wood).
SPECIAL CONCRETE CONSTRUCTION.

A form for every pile—
A pile for every purpose.

Services and Facilities

Our staff of experts is at your service to assist in the design and installation of concrete piles for all purposes and to meet all conditions.

Engineering—Our engineering department is available to engineers and architects at all times for investigation work and consultation, and we will gladly submit recommendations, designs and estimates covering any problem within the scope of our business.

Equipment—Every Raymond driver is built of structural steel, scientifically designed for the most rapid and economical construction, and the major portion of our equipment is built in our own machine shop.

Classification of Concrete Piles

Concrete piles are of three types: "Cast-in-place"; "Pre-cast" and "Composite."

Cast-in-place Concrete Piles—Piles which are made in place are commonly referred to as "cast-in-place" concrete piles, and are divided into two classes:

(a) Those in which a *form is left in the ground* to preserve the integrity of the finished pile, and the driving resistance created (the Raymond method).
(b) Those in which the concrete is placed by means of a temporary driving *form which is removed* before the concrete hardens, leaving the pile confined *only* by earth (not the Raymond method).

Pre-cast Concrete Piles—Piles of this type are cast in forms or moulds, then driven like wooden piles.

Composite Piles—This type is made by superimposing a cast-in-place concrete pile, or section, on a previously driven wood pile.

Generally used where unusual depths are encountered.

RAYMOND CAST-IN-PLACE CONCRETE PILES

The Raymond Method

A collapsible steel core, usually 8-in. diam. at the point and increasing in diameter at the rate of 0.4 in. per lin. ft. of length, is incased by a spirally reinforced steel metal shell.

The core, thus incased, is driven to a proper penetration in accordance with the *Engineering News* formula.

It is then collapsed and withdrawn from the shell, the shell remaining in the ground, maintaining the resistance encountered in the driving.

The shell-lined hole is then *inspected* and if found perfect from tip to top is filled with concrete, making a perfect concrete pile.

Under certain conditions we use a core with a larger point diameter.

Advantages

(1) Absolute permanency: immunity from decay or from the attacks of wood borers and destroyers.

(2) Economy, because of greater carrying capacity—meaning a less number of piles for a given load. The greater carrying capacity rests upon several points—to wit:

(a) Greater size, therefore greater displacement and frictional area.
(b) Greater taper, therefore greater frictional value per square foot.
(c) Perfect shape, therefore positive contact with the ground at every point.
(d) Possibility of inspection after driving, hence the ability to load to full capacity, instead of making a large allowance for inefficiency as in the case of wood piles subject to injury by overdriving, telescoping, departing from the vertical, and like defects, none of which are discernible at the moment when correction is possible.
(e) Decreased length of pile as a natural consequence of greater size and taper.

(3) Smaller and lighter footings, because of decreased number of piles.

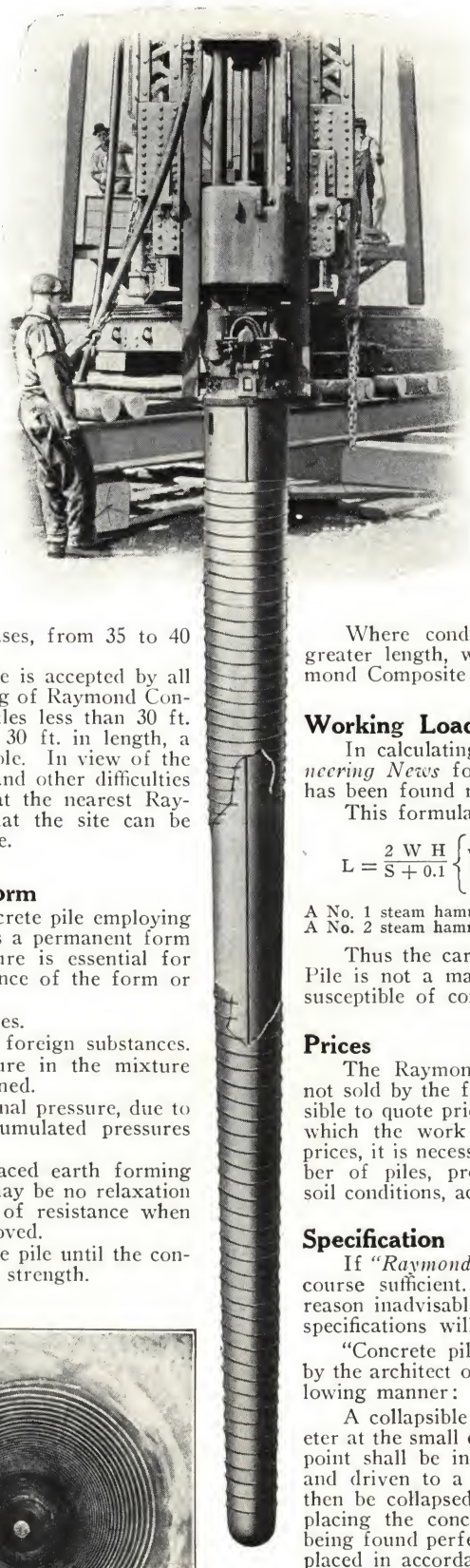
(4) Decrease in total load to be carried, because of decreased weight of footings.

(5) Practical elimination of shoring, underpinning, sheeting, pumping and deep excavation and the reduction of masonry.

(6) Due to decreased number of piles and consequent reduction in width of wall footings, the center line of columns can be brought nearer to the building line.

(7) Important saving in time caused by:

(a) The smaller number of piles required.
(b) The reduction in the amount of excavation, shoring, sheeting and pumping.
(c) The reduction in quantities of footing or masonry.
(d) Manufacture of the pile in place, from materials readily procurable in all localities, and limit of manufacture to the actual number and exact length of piles required. There is no delay for cutting and trimming trees, hauling to shipping point, transporting for great distances by rail or water and delivery to the job, perhaps only to find that the piles are too long or too short.



Loads and Spacing

Usually Raymond Concrete Piles are driven to carry a working load of 30 tons each, but in some cases, from 35 to 40 tons are safely carried.

A working load of 30 tons per pile is accepted by all building departments. The usual spacing of Raymond Concrete Piles is 2 ft. 6-in. centers for piles less than 30 ft. in length, and for piles in excess of 30 ft. in length, a spacing of 3-ft. centers is more desirable. In view of the very wide variation in soil conditions and other difficulties surrounding a job, it is suggested that the nearest Raymond office be conferred with, so that the site can be investigated and recommendations made.

Steel Casing as a Permanent Form

The Raymond Pile is the only concrete pile employing the spirally reinforced driven casing as a permanent form to remain in the ground. This feature is essential for perfect dependable results. The province of the form or shell is manifold:

(1) To serve as a form for the piles.

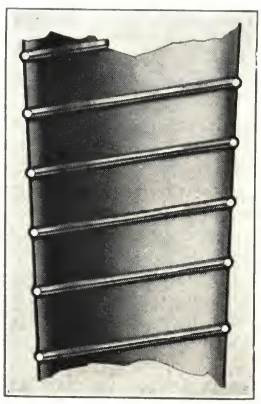
(2) To prevent the admixture of foreign substances.

(3) To retain the original moisture in the mixture until the concrete is thoroughly hardened.

(4) To prevent distortion by external pressure, due to the driving of adjacent piles or accumulated pressures from displacement by the pile itself.

(5) To perfectly retain the displaced earth forming the walls of the cavity, so that there may be no relaxation of the ground and therefore no loss of resistance when the displacing force (the core) is removed.

(6) To act as reinforcement of the pile until the concrete shall have attained its maximum strength.



Section of Spiral Shell

Looking Down Into a Driven Shell—30 Ft. Long

Advantages of Taper

The Raymond Concrete Pile possesses an extreme taper and offers a maximum resistance for a given length—proved by a comprehensive record of resistance encountered in driving plus an extensive series of loading tests, during which the real carrying power of the pile has been checked with the driving resistance.

The failure to appreciate the greater carrying capacity of a tapered pile has increased the cost of many concrete pile foundations, for the reason that contracts are often awarded solely on the basis of the lowest price per lineal foot.

Sizes and Weight of Material

The standard Raymond Concrete Pile is installed by the use of a pile core 8 in. diam. at the point and increasing in diameter 0.4 per lin. ft. of length. For instance a pile 20 ft. in length would be 16 in. diam. at the top, while a pile 37 ft. long would have a top diameter of 22.8 in.

The present limit in length of a *standard* Raymond Concrete Pile is 37 ft. 6 in.

Where conditions are such as to require piles of greater length, we call attention particularly to the Raymond Composite Pile, described on the following page.

Working Loads

In calculating the resistance to penetration, the *Engineering News* formula, based on using a steam hammer, has been found most satisfactory.

This formula follows:

$$L = \frac{2\ W\ H}{S + 0.1}$$

L = Load in pounds
W = Weight of falling parts in pounds
H = Drop in feet of falling parts
S = Final penetration per blow in inches.

A No. 1 steam hammer has a weight of 5000 lb. falling 36 in.
A No. 2 steam hammer has a weight of 3000 lb. falling 30 in.

Thus the carrying capacity of the Raymond Concrete Pile is not a matter of guesswork or speculation, but is susceptible of computation and demonstration.

Prices

The Raymond Concrete Pile is "made-in-place" and not sold by the foot, f. o. b. cars, consequently it is impossible to quote prices without knowing the conditions under which the work is to be done. For even approximate prices, it is necessary to have some knowledge of the number of piles, probable length, the approximate spacing, soil conditions, accessibility of the site, etc.

Specification

If *"Raymond Concrete Piles"* are called for, this is of course sufficient. On the other hand, if it is for any reason inadvisable to name them specifically the following specifications will cover:

"Concrete piles shall be of a type specially approved by the architect or engineer, and shall be placed in the following manner:

A collapsible steel mandrel or pile core 8 in. in diameter at the small end and 20 in. in diameter 30 ft. from that point shall be incased in a spirally reinforced steel shell and driven to a proper penetration. The pile core shall then be collapsed and withdrawn from the shell. Before placing the concrete, each shell shall be inspected and, being found perfect, shall thereupon be filled with concrete placed in accordance with the best practice."

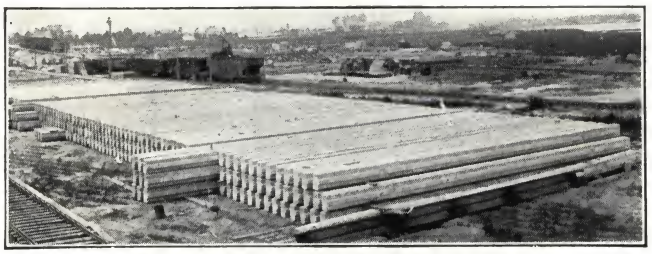
or

"Moulded-in-place piles shall be of a type suitable for the conditions and subject to the approval of the architect or engineer. They shall be formed in casings left in place, which shall be of sufficient strength to prevent distortion or bulging after mandrel has been withdrawn and while the cavity is being filled with concrete or during the driving of adjacent casings."

RAYMOND PRE-CAST CONCRETE PILES

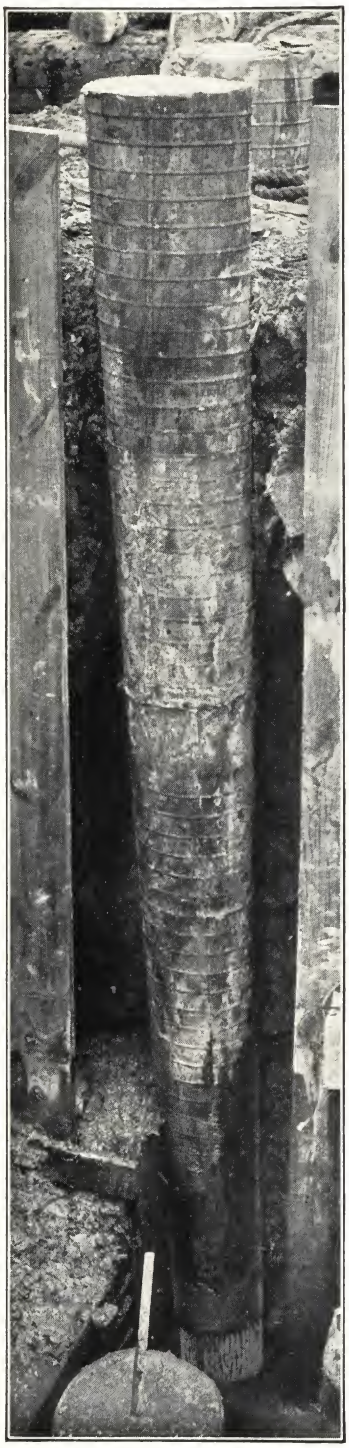
Pre-cast piles are cast in moulds and then driven in place like wooden piles.

They have a large and useful field of application, particularly in marine structures, such as docks, bulkheads, etc.



Pre-cast Piles Ready for Installation

The Raymond Concrete Pile Company is prepared through its experience, to give good advice on the use of pre-cast piles, and also to design and construct work in which a pre-cast pile can be used economically and advantageously.



A Composite Pile Exposed to a Point Below the Joint

RAYMOND COMPOSITE PILES (Concrete and Wood)

For use where depths greater than 37 ft. 6 in. are encountered, we have developed a composite pile made up by superimposing a Raymond cast-in-place concrete section on a previously driven wooden pile, and placed composite piles exceeding 115 ft. in length.

Where long piles are required and permanent water level is within a reasonable distance below the surface, it is usually cheaper to substitute wood for concrete in that portion of the pile which is permanently submerged. The idea is not a new one but the development of *a joint of sufficient strength and rigidity,* together with a method that will insure uniform and satisfactory results, has required considerable thought and ingenuity and a long series of experiments.

After several years of experimentation and development, we have produced a joint between the wood and concrete sections which is practically as strong as any part of the completed pile. The Raymond Composite Pile can be considered a recognized structural unit.

Wood piles, in order to be permanent, must be cut off below the water level. If they are permanently submerged, they will last for centuries, providing they are not attacked by animal life or chemical action. *The Raymond Composite Pile consists of a wood pile, cut off below permanent low water,* upon which is superimposed a Raymond Concrete Pile. Following this method, more than 90,000 of Raymond Composite Piles have been driven aggregating more than 4,000,000 lineal feet and they meet the most exacting requirements.

Load and Joint Tests and Pile Spacing

The Company has, in actual practice, made numerous satisfactory load tests, some up to 60 tons on a single pile. Piles placed have varied in over-all lengths from 35 ft. to as much as 117 ft. with concrete sections varying from 8 to 22 ft. long, depending on the distance from cut-off to permanent water level. Raymond Composite Pile joints have been tested as simple beams, as cantilevers and as unsupported columns. The tests have been many and varied; they have been carried out under conditions infinitely more severe than any which are likely to be encountered in actual practice and the results have been such as to satisfy the most exacting critic.

Method of Forming Joint Between Wood Pile and Concrete Section

Ready for the Footing

Cutaway Showing Joint Between Concrete and Wood Sections

In composite pile design and construction there are important factors which must be taken into consideration:

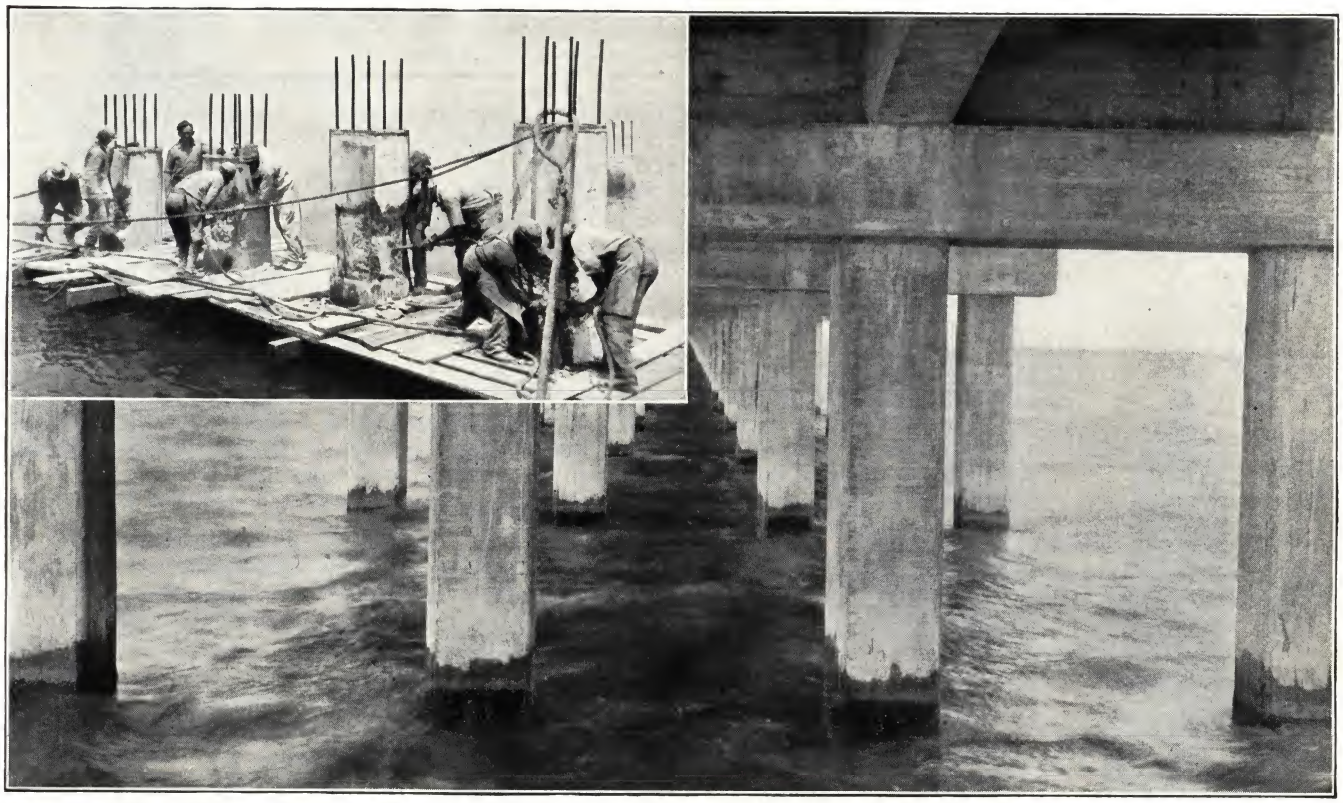
The necessity of using long composite piles indicates upper earth strata of unusually unstable qualities, an earth condition against the action of which the joint between the upper and lower sections must be of such a character and strength that the entire pile can be considered as one rather than two parts, and a joint which will resist powerful uplifting earth pressures on the upper section of the pile, which uplifting pressures produce a strong tendency toward separation of the pile at the joint, causing the lower section of the pile to become detached from the upper section, making the lower section absolutely useless, thereby bringing into the construction of the pile an erroneous sense of non-existent strength and security and causing a waste of all the money expended in the construction of that part of the pile below the joint. The Raymond composite pile lower section is *locked* to the upper section by a positive device, thereby preventing any separation of the pile at the joint and guaranteeing a 100% composite pile from top to bottom.

Raymond Composite Piles can ordinarily be driven 2 ft. 6 in. center to center, although under some conditions, it is desirable to space the piles farther apart. We recommend that you confer with our nearest office as to pile layout—it often proves economical to work out the spacing of piles to meet particular and specific conditions.

SPECIAL CONCRETE CONSTRUCTION

In addition to the placing of standard Raymond Concrete Piles for foundation of structures on land, we construct and design permanent docks, piers, bulkheads, trestles, storage bins, retaining walls, bridges, heavy foundations, shipways, drydocks, etc.

Each problem requires special study for solution and our experienced organization is yours to command.



Pre-cast Piles in Place Showing the Perfect Alignment—Insert Shows Workmen Cutting Off Pre-cast Piles Preparatory to Placing Forms for Girders

A FEW OF THE MANY ARCHITECTS WHO HAVE BEEN SATISFIED WITH RAYMOND CONCRETE PILES AND RAYMOND SERVICE

Since 1901 when the first Raymond concrete pile was placed, we have placed up to December, 1930, more than 34,500,000 ft. of Raymond concrete piles throughout the United States, covered by over 3400 separate and individual contracts. We will be only too glad to have you refer to any of the many engineers, architects, owners, and general contractors with whom we have been associated. A partial list of architects follows:

Ernest Flagg, New York, N. Y.
Voorhees, Gmelin & Walker, New York, N. Y.
Dwight P. Robinson & Co., Inc., New York, N. Y.
Trowbridge & Livingston, New York, N. Y.
Warren & Wetmore, New York, N. Y.
Buchman & Kahn, New York, N. Y.
Guilbert & Betelle, Newark, N. J.
Holabird & Root, Chicago, Ill.
Nimmons, Carr & Wright, Chicago, Ill.
Rapp & Rapp, Chicago, Ill.
Graham, Anderson, Probst & White, Chicago, Ill.
H. L. Stevens & Co., Chicago, Ill.
Rankin & Kellogg, Philadelphia, Pa.
Zantzinger, Borie & Medary, Philadelphia, Pa.
Horace Trumbauer, Philadelphia, Pa.
Paul P. Cret, Philadelphia, Pa.
Monks & Johnson, Boston, Mass.
Lockwood, Greene & Co., Boston, Mass.
Stone & Webster, Boston, Mass.
Clyde N. & Nelson Friz, Baltimore, Md.

Wm. H. Emory Jr., Baltimore, Md.
Albert Kahn, Inc., Detroit, Mich.
Smith, Hinchman & Grylls, Detroit, Mich.
Henry Hornbostle, Pittsburgh, Pa.
Joseph F. Kuntz, Pittsburgh, Pa.
Edward Stotz, Pittsburgh, Pa.
Hunting, Davis & Dunnells, Pittsburgh, Pa.
Aegerter & Bailey, St. Louis, Mo.
Mauran, Russell & Crowell, St. Louis, Mo.
William B. Ittner, Inc., St. Louis, Mo.
Supervising Architect, U. S. Treasury, Washington, D. C.
Marye, Alger & Vinour, Atlanta, Ga.
Diboll & Owen, Ltd., New Orleans, La.
Ebbets & Frid, Hartford, Conn.
McClintock & Craig, Springfield, Mass.
J. Latenser & Sons, Omaha, Neb.
A. E. Harvey, Los Angeles, Cal.
Claud W. Beelman, Los Angeles, Cal.
Aleck E. Curlett, Los Angeles, Cal.
Proudfoot, Rawson, Souers & Thomas, Des Moines, Iowa

SPENCER, WHITE & PRENTIS

Foundations and Underpinning

SPENCER, WHITE & PRENTIS, INC.
10 East 40th Street
NEW YORK, N. Y.

THE SPENCER, WHITE & PRENTIS CO.
Book Building
DETROIT, MICH.
Terminal Tower Building
CLEVELAND, OHIO

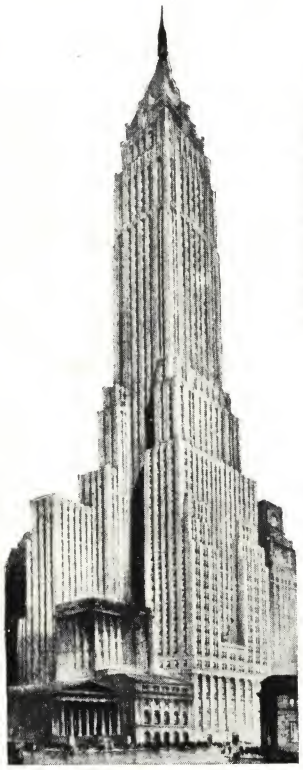
Products

FOUNDATIONS of every type.
UNDERPINNING of every type.
MASS CONCRETE CONSTRUCTION.
SOIL TESTS.

Services

SPENCER, WHITE & PRENTIS are prepared to consult with architects, engineers and owners on their foundation and underpinning problems, to submit designs, and to install foundations, underpinning, and mass concrete construction.

The personnel of the SPENCER, WHITE & PRENTIS companies have been engaged for many years in engineering operations. They have developed numerous construction processes, among which are Tuba Steel Foundations, the installation of foundations for new buildings under existing buildings on the site either before or during demolition of the latter, Pretest Foundations and Pretest Underpinning.



Caisson Foundations Installed During Demolition of Old Building—Bank of Manhattan Building, New York

H. CRAIG SEVERANCE and YASUO MATSUI, Associated Architects
STARRETT BROS. AND EKEN, INC., Builders

Caisson Foundations

SPENCER, WHITE & PRENTIS have installed many caisson foundations, including, probably, the deepest building foundation in the world, and are fully equipped to do both pneumatic and open caisson work. Improved methods for installing caisson foundations, which reduce both the cost and the time required for installations, have been developed by these companies. Under many conditions these newer methods permit the use of open caissons in place of the more expensive pneumatic type.

Some of the caisson foundations installed are:

Central Savings Bank, New York, N. Y.
Bank of Manhattan Building, New York, N. Y.
21 West Street Building, New York, N. Y.
Fidelity Philadelphia Trust Co., Philadelphia, Pa.
Cleveland Union Terminal, Cleveland, Ohio
City Hall, Buffalo, N. Y.

Foundations Under Existing Buildings

To save time in construction, SPENCER, WHITE & PRENTIS, have developed methods for installing new building foundations prior to or during the demolition of existing buildings on the site. The time saved has run from four to six months on big operations. and in one case has made it possible to demolish existing buildings and erect a new 70-story building in eleven months.

Caissons to rock, Tuba Steel Foundations to rock or spread footings are installed in the basements of the old buildings on the site. When necessary, due to lack of space or time, temporary footings are installed sufficient to carry only a part of the ultimate load, and are increased in size later.

Steel erection is started immediately upon completion of the demolition, sometimes before it is finished. After the steelwork is under way, the general excavation and incidental work are done and the temporary foundations are increased to their permanent size.

Buildings where these methods were used include:

American Surety Co., New York, N. Y.
Bank of Manhattan Building, New York, N. Y.
Abraham & Straus Department Store, Brooklyn, N. Y.
Hudson Department Store, Detroit, Mich.

One of the World's Deepest Building Foundations—250 Ft. Below Curb, Union Terminal, Cleveland

GRAHAM, ANDERSON, PROBST & WHITE, Architects
CLEVELAND TERMINALS CO., *Engineers*

Tuba Steel Foundations

Tuba Steel Foundations are composed of groups of concrete filled steel cylinders. They provide permanent rock-bearing support at great savings in time and expense over open or pneumatic caissons.

The Tuba Steel Cylinders which comprise these foundations are steel tubing, 10¾ to 18 ins. outside diameter, $\frac{5}{16}$ to $\frac{9}{16}$ in. thick, driven to rock by steam or pneumatic hammers.

Sections of tubing are joined together by internal cast steel sleeves. After being seated on the rock they are cleaned out, filled with concrete and capped with reinforced concrete.

Safety—Tuba Steel Cylinders derive their support from end bearing and not from skin friction. On this account they are not subject to damaging settlement and are not affected by future adjoining operations. When driven to rock they are the equivalent in every respect of caisson piers.

Speed—Tuba Steel Foundations effect a time saving over open caissons of 50% or more, and can be

installed more rapidly than concrete or wood pile foundations.

Economy—Generally, Tuba Steel Cylinders can be installed at much lower cost than caisson piers to rock. For great depths, water conditions and where piers are to be installed near adjoining structures, the saving is very great. They can usually compete in price with any type of pile foundation.

Tube Steel Foundations Installed in 19 Working Days, Wall and Hanover Building, New York
DELANO & ALDRICH, Architects
STARRETT BROS. & EKEN, Builders

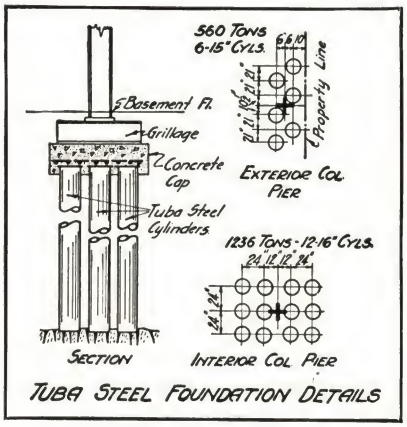
Carrying Capacity—Tuba Steel Cylinders are figured as unsupported columns. The New York Building Code conservatively allows 500 lbs. per sq. in. on the concrete and 7500 lbs. per sq. in. on the steel after deducting the outside $\frac{1}{16}$ in. of steel for possible rusting.

NEW YORK BUILDING CODE
Allowable Load in Tons for Bearing on Rock

Diam., in.	Thickness of shell, in.			
	5/16	3/8	7/16	1/2
10	49.8	57.6	65.5	73.4
12	64.4	73.6	83.0	92.4
14	75.3	84.4	93.5	102.4
15	83.6	93.5	103.2	112.9
16	92.4	103.5	113.4	123.8
18	111.2	123.1	134.9	146.6

Note: When rock is at a prohibitive depth, Tuba Steel Cylinders are driven to other strata. So driven, they have all of the advantages of Tuba Steel Foundations to rock, except that the loadings are reduced.

A Few of Many Tuba Steel Foundations—
Wall and Hanover Building, New York, N. Y. (38 stories)
Starrett-Lehigh Building, New York, N. Y.
19 Rector Street Building, New York, N. Y. (44 stories)
National Newark and Essex Bank Building, Newark, N. J.
Industrial Trust Co., Providence, R. I.
First National Bank, Tampa, Fla.



TUBA STEEL FOUNDATION DETAILS

Pretest Underpinning (Patented)

Pretest Underpinning is employed to provide new and deeper foundations for existing structures when adjacent excavations are to be made which may affect the existing foundations. It is also employed to arrest the settlement of structures whose foundations have proved inadequate and to increase the bearing capacity of existing foundations to which loads are to be added.

Advantages—Pretest Underpinning is applicable to every type of structure and to nearly every ground condition. It entails the least interference with the full use of the structure and of adjoining property and streets during installation. Pretest Underpinning eliminates damage through settlement by reducing settlement to the absolute minimum.

Pretest Method—Details of the Pretest Underpinning method are varied as required to meet individual conditions. Generally, sectional steel cylinders are jacked down beneath the foundation of a structure to a satisfactory bearing material, cleaned out and filled with concrete. Each cylinder is then tested to overload, usually 50% in excess of permanent load, and the load of the structure is transferred to the cylinder by the patented Pretest wedging method which *maintains the full test load on the cylinder during wedging.* Under any other method the test load is released, resulting in rebound of the cylinder and subsequent settlement when the load of the structure is applied. Pretest Underpinning prevents this rebound and eliminates settlement or reduces it to a negligible amount.

Testing and Wedging Pretest Cylinders

Where Used—Pretest Underpinning has been installed under hundreds of structures, including buildings up to 28 stories in height, bridge piers, elevated railroads, retaining walls, chimneys, etc. It has been used for underpinning the buildings along many miles of subways in New York and Philadelphia.

Concentrated loads up to 1200 tons have been underpinned by the Pretest Method, and cylinders have penetrated to depths as great as 90 ft.

Concrete Underpinning

For structures on dry materials at reasonable depth, plain concrete underpinning is used. The modern method is to sink pits—so located and constructed that, generally, no needling or shoring is required—build concrete walls or piers in the pits up to the existing foundations and transfer the load to the new footings by dry packing or wedging.

Pretest Soil Tests

The Pretest Method (patented) is a most accurate means of determining the bearing value of soils at reasonable cost. Reaction is obtained under an existing structure, against the sides of a pit or against a loaded platform. The test is made by hydraulic jacks on any desired area and can be maintained at any loading for as long a period as desired.

Mass Concrete Construction

SPENCER, WHITE & PRENTIS install heavy concrete structures such as bridge piers, viaducts, dams, retaining walls, etc., especially under difficult conditions.

Details of any of the above processes will be supplied on request

WESTERN FOUNDATION COMPANY

Engineers and Contractors

308 West Washington Street
CHICAGO, ILL.

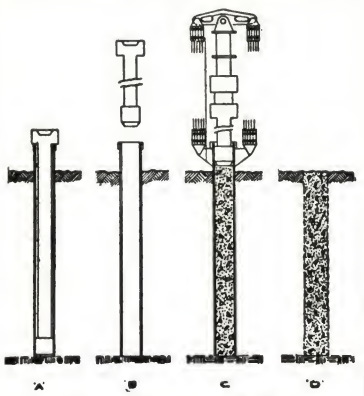
Products

PILES: Cast-in-place Concrete; Composite Concrete and Wood; Steel Pipe, open or closed end; Precast Concrete; Wood.

Also Caissons; Underpinning.

Service Based on Experience

The WESTERN FOUNDATION COMPANY is prepared to install any type of foundation required where it is not practical to use spread footings. Experience shows that no one type of foundation is either economically or engineeringly correct for all soil conditions. For example, on one of our jobs we used six different types of foundation and on another it was necessary to try three before a satisfactory one was found, the method finally adopted being one which had never been used before in any foundation. We give below descriptions of three of the most common methods used by us. We invite correspondence and would be glad to have our engineers confer with any one relative to their problems.



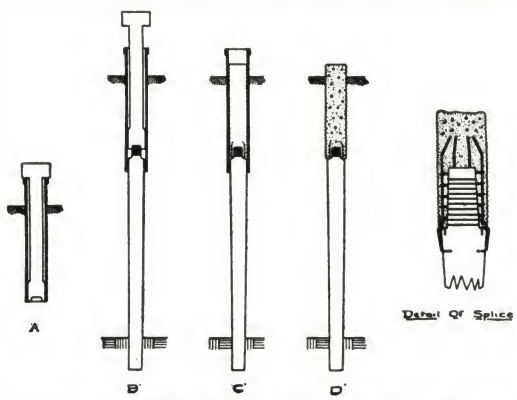
Compressed Concrete Pile

(a) An apparatus consisting of a heavy steel drive casing and solid pointed core driven into ground until required resistance to driving is obtained.

(b) Core removed.

(c) Casing filled with concrete of coarse aggregate and small slump and core replaced in contact with concrete. Note that the force necessary to withdraw casing passes through core and therefore through concrete so that there is no chance of withdrawing casing without a simultaneous deposit of concrete taking place under high pressure.

(d) Finished pile; drive casing removed



Composite Pile (Cased Concrete and Wood with Reinforced Splice)

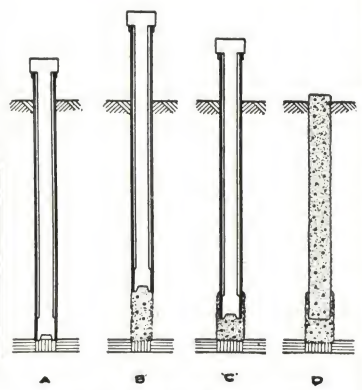
(a) A heavy steel casing and a solid pointed core driven into ground to a point well below permanent ground water level.

(b) Core removed and a wooden pile driven through casing using the core as a follower. Wooden pile is provided with rope grummets to exclude water and mud.

(c) Core removed and corrugated metal shell, carrying reinforcing cage at lower end, inserted in casing and over head of wood pile.

(d) Corrugated shell filled with concrete; heavy casing removed.

Detail of Splice—Wire-wound tenon of pile, splice reinforcement (spiral and verticals), dogs which prevent lifting of shell due to driving of adjacent piles before concrete is set, and spacers and grummet which center wood pile in driving casing, form a seat for corrugated shell, and exclude mud and water



Cased Pedestaled Concrete Pile

(a) A heavy steel casing and a solid pointed core are driven into ground until solid strata is reached.

(b) Core removed and a wet mixed concrete placed in casing. With core in contact with deposited concrete, casing is pulled over core until again fully entered in casing.

(c) Core and casing together are redriven through deposited concrete, spreading it to form a pedestal.

(d) Core removed and a corrugated metal shell placed inside casing. Shell is filled with concrete and casing removed, soft concrete in pedestal flowing around it

Some Architects and Contractors for Whom We Have Done Work

Architects Located in Chicago, Ill.

Alfred S. Alschuler, 28 E. Jackson Blvd.
John Archibald Armstrong, 127 No. Dearborn St.
Battey & Kipp, Inc., 231 So. La Salle St.
Bennett, Parsons & Frost, 80 E. Jackson Blvd.
Condron & Post, 53 W. Jackson Blvd.—2 jobs
Folz & Brand, 510 No. Dearborn St.
Graham, Anderson, Probst & White, 80 E. Jackson Blvd.—3 jobs
Ernest A. Grunsfeld, Jr., 1307 Tribune Tower
Holabird & Root, 333 No. Michigan Ave.
M. J. Morehouse, 343 So. Dearborn St.
Schmidt, Garden & Erikson, 104 So. Michigan Ave.
Thielbar & Fugard, 219 E. Superior St.

Architects Located in Miscellaneous Cities

Harry Hake, 2400 Gilbert Ave., Cincinnati, Ohio—3 jobs
Albert Kahn, Marquette Bldg., Detroit, Mich.—3 jobs
Kirchoff & Rose, 210 Sycamore St., Milwaukee, Wis.
Smith, Hinchman & Grylls, Marquette Bldg., Detroit, Mich.
John T. Windrim, N. W. Cor. 12th and Chestnut Sts., Philadelphia, Pa.

Contractors Located in Chicago, Ill.

Avery Brundage, 110 So. Dearborn St.—3 jobs
Contracting & Materials Co., 42 E. Pearson St.
John Griffiths, Builders Bldg.—2 jobs
Hegeman-Harris Company, Tribune Bldg.
Kelly-Atkinson Construction Co., 189 W. Madison St.—2 jobs
MacDonald Engineering Co., 53 W. Jackson Blvd.—5 jobs
South Parks Board, Linn White, Chief Engineer, 57th and Cottage Grove Ave.—13 jobs
Turner Construction Company, 6 No. Michigan Ave.
R. C. Wieboldt Co., 1412 W. Washington St.—4 jobs

Contractors Located in Miscellaneous Cities

Austin Company, Cleveland, Ohio—2 jobs
Bartlett Hayward Company, Baltimore, Md.—3 jobs
A. Bentley & Sons, Toledo, Ohio—2 jobs
Bryant & Detwiler, 2814 Union Trust Bldg., Detroit, Mich.
Day & Zimmerman, 1600 Walnut St., Philadelphia, Pa.
Ferro Concrete Construction Co., Third and Elm Sts., Cincinnati, Ohio—3 jobs.
T. J. Forschner Contracting Co., 39th St. and 52nd Ave., Cicero, Ill.—2 jobs
M. A. Long Company, 10 W. Chase St., Baltimore, Md.

MASONRY MATERIALS

◈ ◈ ◈

CONCRETE AND MONOLITHIC CONSTRUCTION

MEDUSA PORTLAND CEMENT COMPANY

Member of The Producers' Council

Manufacturer of Medusa Waterproofed Cements

1002 Engineers Building
CLEVELAND, OHIO

SALES OFFICES

CHICAGO, ILL., 1704 The Builders Building
CINCINNATI, OHIO, Building Industries Building
GRAND RAPIDS, MICH., 602 Grand Rapids Trust Building
MANITOWOC, WIS.
NEW YORK, N. Y., 1521 New York Central Building
PITTSBURGH, PA., 1829 Oliver Building
TOLEDO, OHIO, Second National Bank Building
WASHINGTON, D. C., Chandler Building
YORK, PA., 25 North George Street

PLANTS

SANDUSKY, OHIO
TOLEDO, OHIO
MANITOWOC, WIS.
DIXON, ILL.
YORK, PA.
WAMPUM, PA.
NEWAYGO, MICH.

Products

MEDUSA GRAY PORTLAND CEMENT.
MEDUSA WATERPROOFED GRAY PORTLAND CEMENT.
MEDUSA WHITE PORTLAND CEMENT.
MEDUSA WATERPROOFED WHITE PORTLAND CEMENT.
MEDUSA WATERPROOFING, Powder and Paste.
MEDUSA PORTLAND CEMENT PAINT.
MEDUSA-MIX, the Masonry Cement.
MEDUSA STONESET CEMENT.

MEDUSA WATERPROOFED GRAY PORTLAND CEMENT

Successful for 21 Years

Description

Medusa Waterproofed Gray Portland Cement is our regular Gray Portland Cement with which the correct amount of Medusa Waterproofing Powder is mechanically ground during the process of manufacture, insuring a complete distribution and obtaining the maximum waterproofing value of the powder. The action of the waterproofing is to overcome the capillary attraction of moisture or water through the very minute voids which are always present in all concrete.

When water is mixed with Medusa Waterproofed Gray Portland Cement, it will not segregate the waterproofing powder from the cement.

Quality

Medusa Waterproofed Gray Portland Cement passes all the requirements of the American Society for Testing Materials' Specifications for Portland Cement as to strength, setting time, fineness, etc.

Where to Use

Medusa Waterproofed Gray Portland Cement should be specified and used in all concrete and mortar placed below grade, and above grade where it is exposed to the elements or water.

Mixing

With the exception of hand mixing, all specifications for the use of this material are the same as used for any good concrete work. When mixed by hand, the wetting of the aggregates before adding the waterproofed cement will be advantageous. Machine mixing should not be less than one and one-half minutes per batch.

Efflorescence

Medusa Waterproofed Gray Portland Cement tends to prevent efflorescence due to soluble impurities contained in the mortar. The waterproofing prevents

MEDUSA WATERPROOFED GRAY PORTLAND CEMENT (Continued)

absorption by the mortar of water from leaks, rains and atmospheric dampness, consequently these soluble impurities cannot be reduced to a solution and brought to the outer surface and left as a white deposit upon evaporation of the water.

Advantages

The use of Medusa Waterproofed Gray Portland Cement is a most practical way of producing concrete and mortar that will be impervious to the penetration of moisture, permanently. It improves workability.

When using Medusa Waterproofed Gray Portland Cement, no admixtures are necessary. This fact is extremely important to the architect or contractor. The quality of the concrete or mortar is assured because the danger of error in adding admixtures on the job is eliminated. The contractor is saved the expense and labor of adding admixtures and the architect is assured that the proper amount of waterproofing has been added.

Successfully Used for 21 Years

The best recommendation we can offer for Medusa Waterproofed Gray Portland Cement is that it has been successfully used in all parts of the United States, under very severe conditions for 21 years.

Technical Department

Our Technical Department is at the disposal of architects and contractors for assistance in any problems pertaining to the use of Medusa Waterproofed Gray Portland Cement or other Medusa Products. This service is without obligation.

Literature

Our book "How to Make Good Waterproofed Concrete," A.I.A. File No. 4, 28 pages, 8½x11 ins. carries a complete description of Medusa Waterproofed Gray Portland Cement and gives specifications for producing good waterproofed concrete, mortar specifications and specifications for waterproofed swimming pool construction as well as waterproofing of existing work.

Full tests on tensile and compressive strength, and setting time are included.

Literature covering various uses of other Medusa Products will be sent to anyone interested without obligation or cost.

MEDUSA WHITE PORTLAND CEMENT

Plain and Waterproofed

Medusa Portland Cement Company was the first manufacturer to produce and place on the market for commercial purposes a true White Portland Cement. The plant to produce Medusa White Portland Cement was built in 1907 and since then this material has been sold and shipped continuously to all parts of the world.

Quality

Medusa White Portland Cement is a true Portland Cement which passes the requirements for Portland Cement of the American Society for Testing Materials. It differs from gray Portland Cement only in that it is pure white in color and is non-staining. The setting time is the same.

Funeral Home, Ottumwa, Iowa
Archie Eaton, Architect
Medusa Waterproofed Gray Cement in basement walls

Home of Homer A. Robinson, South Bend, Ind.
H. Russell Stapp, Architect
Medusa Waterproofed Gray Portland Cement used in foundation

MEDUSA WHITE PORTLAND CEMENT (Continued)

Non-Staining

By Non-staining we mean that when used in mortar, it will not stain the stone with which it comes in contact.

Where to Use

Medusa White Portland Cement produces concrete and mortar of the same great strength as regular gray portland cement. It should be used in place of gray cement when pure white or tinted effects are desired. Many beautiful colored effects can be secured through the use of colored aggregates or pure mineral colors.

Mortar Specifications

For a non-staining mortar for the setting and pargeting of cut stone, we recommend:

1 part Medusa White Portland Cement.

3 parts clean sand, crushed white marble or screened limestone chips, graded so that all coarse particles will pass a ⅛-in. screen with no more than 15% passing a No. 60-screen.

With every bag of Medusa White Portland Cement, use 10 lbs. of hydrated lime or one-fifth part by volume of the cement. Properly slaked and aged lime putty may be used instead of hydrated lime.

Swimming Pools

Medusa White Portland Cement is used for plaster coating the inside of concrete swimming pools on the side walls and floors. It is also used in pouring the entire walls of the tank.

Complete specifications on pool construction will be found in our book "How to Make Good Waterproofed Concrete," A.I.A. File No. 4.

Stucco

Complete specifications for Portland Cement Stucco will be found in our book "Portland Cement Stucco with Medusa Waterproofed White Portland Cement," A.I.A. File No. 21-d-1.

Terrazzo

Complete specifications for Terrazzo will be found in our book "Terrazzo Specifications," A.I.A. File No. 22-E-1.

Cast Stone

Medusa White Portland Cement (Plain or Waterproofed) should be used for facing of cast stone. Complete specifications for cast stone can be secured from the Cast Stone Institute, Chicago, Ill.

Other Uses

Architects are finding new uses for this material and a few of them are listed below:

Interior Plastering
Curbs
White Concrete for Buildings
Sidewalks
Steps
Art Marble
Floor Tile
Runways for Airports

MEDUSA WATERPROOFED WHITE PORTLAND CEMENT

Medusa Waterproofed White Portland Cement is our regular white Portland Cement with which the correct amount of Medusa Waterproofing Powder is mechanically ground during the process of manufacture, insuring a complete dispersion of the powder and so obtaining the maximum waterproofing value of the powder. This waterproofed cement passes all the requirements for portland cement and of the American Society for Testing Materials. We recommend that Medusa Waterproofed White Portland Cement be used for all work requiring White Portland Cement.

Concrete, mortar and stucco made with Medusa Waterproofed White Portland Cement will not absorb moisture, thereby reducing volume change eliminating crazing and hairchecking. When used for mortar it will prevent the staining elements in the back-up masonry penetrating the stone. The workability is enhanced by the waterproofing content.

Home of the Architect, Eugene Fleming, Fairfield, Iowa
Medusa White used for stucco

Home of Herbert Holmgreen, San Antonio, Tex.
Morris & Noonan, Architects
Medusa Waterproofed White used in finish coat of stucco

MEDUSA STONESET CEMENT

A Non-staining, Waterproofed, Mortar Cement

There has been a demand for a mortar for setting, pargeting, and pointing of cut stone, that is non-staining, absolutely waterproofed, and low in cost. The research laboratories of the MEDUSA PORTLAND CEMENT COMPANY have perfected Medusa Stoneset Cement to meet these specifications and requirements.

Architects and builders who specify and use Medusa Stoneset Cement are assured of the same high qualities which have been incorporated in all Medusa Products for thirty-eight years.

What It Is

Medusa Stoneset Cement is a non-staining mortar cement which has been waterproofed by the addition of the proper amount of Medusa Waterproofing mechanically ground in at the mill during the process of manufacture.

It is manufactured from the same raw materials as Medusa Non-staining Waterproofed White Portland Cement. These raw materials are free from the elements which cause staining, and waterproofness is assured.

Medusa Stoneset Cement has the smooth workability and great plasticity which is so necessary in stone setting mortar.

Where to Use

Medusa Stoneset Cement is to be used in mortar for setting, pargeting, and pointing of cut stone, and for laying up face brick. Its low cost also permits its use for mortar in the backup wall as well as for exterior wall.

The use of one mortar throughout the wall has many advantages from the standpoint of economy and convenience. The use of a non-staining, waterproofed mortar throughout the wall provides additional assurance against staining and efflorescence.

We do not recommend Medusa Stoneset Cement for any other use except masonry mortar. Medusa Portland Cements, white and gray (plain or waterproofed), should be used for other purposes.

Because of its light gray color and great plasticity Medusa Stoneset Cement is ideal for laying up face brick. It can be easily tinted to the desired shade.

Non-staining

A non-staining cement means a cement that will not stain the stone with which it comes in contact. Long and exhaustive tests have proved that Medusa Stoneset Cement is non-staining.

Waterproofed

Authorities agree that it is absolutely necessary that all non-staining mortars be waterproofed to prevent the staining elements in other materials in backup masonry from passing into the stone.

The fact that Medusa Waterproofing is mechanically ground into Medusa Stoneset Cement during the process of manufacture is assurance that the cement is absolutely waterproofed.

The Medusa Process of mechanically grinding in Medusa Waterproofing in the manufacture of Medusa Waterproofed Cements, white and gray, has been *successful for 21 years.*

Workability

Medusa Stoneset Cement produces a mortar of great workability and plasticity. Stone setters will find the workability and plasticity of Medusa Stoneset Cement to be of particular advantage in the placing of stone. Its easy spreading qualities make it especially adaptable for pargeting and for use in mortar for the backup wall.

Color

The color of Medusa Stoneset Cement is a very light gray and it harmonizes well with all shades of limestone, granite, marble, etc.

Specifications for Mixing

Medusa Stoneset Cement is to be mixed in approximate proportions of 1 part of Medusa Stoneset Cement to 3 parts of sand, by volume. The sand should be well graded, clean, and free from organic matter. To facilitate hand mixing, the sand should be dampened before Medusa Stoneset Cement is added.

No Admixtures Are Necessary

When using Medusa Stoneset Cement no admixtures are necessary to secure waterproofness or plasticity. This fact is extremely important to the architect, contractor and owner. The quality of the mortar is assured because the danger of error in adding admixtures on the job is eliminated.

The contractor is saved the expense and labor of adding admixtures and the architect is assured that the proper amount of waterproofing has been added.

Packages

Medusa Stoneset Cement is packed in multiwall paper bags, each bag containing 1 cubic foot of cement, 4 bags to the barrel. Medusa Stoneset Cement is not packed in cloth bags.

Setting Time

The setting time of Medusa Stoneset Cement is approximately:

Initial—3 hours 40 minutes. Final—7 hours 15 minutes.

MEDUSA STONESET CEMENT (Continued)

Tensile Strength

Pounds per square inch

(1 part Medusa Stoneset Cement, 3 parts Standard Sand)

3 day	7 day	28 day
128	174	278

Compressive Strength

Pounds per square inch

(1 part Medusa Stoneset Cement, 3 parts Standard Sand)

3 day	7 day	28 day
834	1188	2120

Note: These tests were made according to A.S.T.M. Specifications for Portland Cement.

MEDUSA-MIX—MASONRY CEMENT

Medusa-Mix is a masonry cement with a portland cement base manufactured and placed on the market after an insistent demand by architects and builders who wanted a masonry cement that would be similar in quality to other Medusa Products. It should be specified for laying up brick, concrete units, tile, and other masonry units.

High Quality

Medusa-Mix used in mortar provides the essentials of a good masonry mortar—workability, plasticity, strength and durability. The strength is due to its portland cement base. Great plasticity and workability are obtained without the addition of lime. Its color is a striking advantage when used with or without mortar colors.

Saves Time

Medusa-Mix saves time on your work. The man with the trowel likes it because it spreads easily and smoothly and permits joints to be struck cleanly and rapidly eliminating waste from droppings. These advantages, coupled with the fact that no hydrated lime is required when using Medusa-Mix eliminating extra labor in the mixing and use of mortar, effect a saving in cost.

Setting Time

Architects are quick to see the advantages of the setting time of Medusa-Mix, it having an initial set of approximately 3 to 4½ hours, and a final set of approximately 6 to 8 hours.

High Strength

The standard specifications of the American Society for Testing Materials for natural cement are given below:

Natural cement (mortar cement) serial designations: C10-09
1 part cement, 3 parts standard Ottawa sand
7 days (1 day in moist air—6 days in water) 50 lbs.
28 days (1 day in moist air—6 days in water) 125 lbs.

Now compare these figures with the average reports of tests on Medusa-Mix by disinterested laboratories, made under A.S.T.M. Specifications.

Tensile Strength

Pounds per square inch

(1 part Medusa-Mix, 3 parts Standard Sand)

3 day	7 day	28 day
128	197	267

Compressive Strength

Pounds per square inch

(1 part Medusa-Mix, 3 parts Standard Sand)

3 day	7 day	28 day
633	1371	1795

Medusa-Mix conforms to the United States Government Master Specifications No. 443 and SS-C-181 covering requirements of a masonry cement, which provides for a compressive strength of not less than 175 lbs. per square inch at the age of 7 days, for a 1:3 mortar.

Cleveland Club, Cleveland, Ohio
MEADE & HAMILTON, Architects
THOMPSON-STARRET COMPANY, Contractors
Medusa-Mix used in laying up all brick work. Medusa White Portland Cement used in mortar for setting of all stone

Directions

Mix 1 part of Medusa-Mix with 3 parts of clean, well-graded masons' sand, and add enough water for the desired consistency.

Four sacks of Medusa-Mix (66 lbs. gross, each) mixed with sand in 1:3 proportions will make ½ cubic yard of mortar.

MEDUSA WATERPROOFING FOR CONCRETE AND MORTAR

All concrete and mortar below grade or exposed to the elements should be waterproofed to give insurance against wet and damp walls and floors, to retard disintegration due to the freezing and thawing of moisture absorbed—and ground acids.

Authorities on waterproofing agree that the most effective way to prevent water absorption in concrete and mortar is to incorporate with the concrete or mortar at the time of mixing, a water repellent material that breaks down capillary attraction at the surface. This method is most economical and assures the user that the entire mass of concrete or mortar is thoroughly and permanently waterproofed.

Medusa Waterproofing (Powder or Paste) is the original water repellent waterproofing for concrete and mortar. It has been used for more than 25 years under severe water conditions, and always gives satisfaction.

Medusa Waterproofing Powder—a preformed integral waterproofing—is a finely ground water repellent material, each grain exerting a certain definite field or circle of water repellency. The use of Medusa Waterproofing Powder provides the concrete wtih sufficient water repellency to resist absorption of water or moisture.

Medusa Waterproofing Paste is soluble in water. The chemical combination of the lime in the cement and Medusa Waterproofing Paste forms a calcium stearate lining within the pores and voids of the concrete, thereby furnishing sufficient water repellency to break down capillary attraction.

The same waterproofing results are obtained with either the Powder or Paste.

The use of Medusa Waterproofing is recommended only in territories where Medusa Waterproofed Gray Portland Cement or Medusa Waterproofed White Portland Cement is not obtainable. Medusa Waterproofed Cements—gray and white—are our regular portland cements with which the correct amount of Medusa Waterproofing Powder is mechanically ground during the process of manufacture, insuring a complete dispersion of the powder, and so obtain the maximum waterproofing value of the powder.

The use of Medusa Waterproofed Cements eliminates the use of admixtures on the job and the expense of supervision to insure that the correct amount of waterproofing has been added. Medusa Waterproofed Cements have proved *succcssful for 21 years.*

Specifications

Use 2 lbs. of Medusa Waterproofing (Powder or Paste) to each sack of portland cement used. Medusa Waterproofing Powder is added dry to the cement and aggregates. Medusa Waterproofing Paste is added to the mix through the medium of the gauging water.

Packages

Medusa Waterproofing Powder is shipped in 40-lb. paper lined, cloth bags. Medusa Waterproofing Paste is shipped in 40-lb. cans (5 gal.), 8-lb. cans (1 gal.), and 300-lb. steel drums.

Mixing

Medusa Waterproofing Powder should be thoroughly mixed with the portland cement before the aggregates are added. This is particularly important where hand mixing is employed.

When Medusa Waterproofing Paste is used, mix equal parts of Medusa Paste with water, making a "paste-water." A gallon of "paste-water" contains ½ gal. of Medusa Paste or 4 lbs., enough to waterproof two bags of portland cement.

Determine how much water is required per batch of concrete, after examining the sand and aggregate for quality and moisture. Add to the gauging water 2 lbs. of Medusa Paste for each bag of cement, or to each 5 or 6 gals. of water—whichever quantity is used.

Waterproofed Mortar

The use of Medusa Waterproofing in portland cement mortar will prevent the subsequent discoloration and unsightly appearance of brickwork caused by efflorescence which may be attributed to the mortar.

The use of Medusa Waterproofed Mortar prevents the absorption of moisture through the joints. Unless the mortar is waterproofed, it is possible that such a quantity of water will be absorbed as to cause considerable inconvenience and damage.

Specific Uses

Medusa Waterproofing should be used in all concrete and mortar below grade or exposed to the elements or moisture. A few specific uses are mentioned on the following page.

Union Station, Kansas City, Mo.
Medusa Waterproofing used in retaining wall

Swimming Pool, Culver Military Academy, Culver, Ind.
Medusa Waterproofing used

MEDUSA WATERPROOFING FOR CONCRETE AND MORTAR (Continued)

Mortar
Swimming Pools
Basement Walls
Basement Floors
Retaining Walls
Plaster Coats
Cast Stone
Concrete Products
Shower Baths
Terrazzo
Stucco
Elevator Pits
Storage Silos
Tunnels
Subways
Dairy Barns
Dairy Plants
Burial Vaults

Literature

Our book "How to Make Good Waterproofed Concrete," A.I.A. File No. 4 contains full specifications and "Medusa Waterproofing for Concrete and Mortar," A.I.A. File No. 7-a-2 will be mailed free, upon request.

MEDUSA PORTLAND CEMENT PAINT

For Concrete, Brick and Masonry

Description

Medusa Portland Cement Paint is a patented material which has as its base Medusa White Portland Cement specially prepared, with which we have ground chemicals and color pigments of a permanent nature. It contains no oil, glue, lime, casein or other material affected by the chemical action of lime, alkali or water.

Colors

Medusa Portland Cement Paint is furnished in seven practical colors, as follows: White, Stone Gray, Pearl Gray, Red, Cream, Green and Blue.

Packages

Shipped in 10-lb. and 50-lb. metal cans and 350-lb. steel drums, all having friction tops. Each can gives directions for application.

Where It Should Be Specified

Medusa Portland Cement Paint is recommended as a damproof and decorative finish for interior or exterior concrete, brick, and masonry surfaces of all kinds—except floors and vitrified, enameled or magnesite surfaces. This material has a portland cement base and contains no lime, glue, casein, or other materials that are affected by the chemical action of lime and alkalis in the masonry. It is unaffected by moisture and can be applied to interior or exterior surfaces that are wet or damp, without the use of neutralizing agents. *It is more than a coating for concrete and masonry surfaces—it becomes a homogeneous part of such surfaces.*

Swimming Pools

Medusa Portland Cement Paint is very extensively used for the interior of swimming pools and we have thousands of successful jobs. It is particularly appropriate for swimming pools because it is unaffected by moisture or the water in the pool. It gives a washable surface and facilitates easy cleaning of the pool.

Mixing and Application

Full directions for mixing and applying this material will be found in our book "How to Paint Concrete and Masonry Surfaces" and our color-chip folder, as well as on each package in which the material is shipped.

Specific Uses

We mention below a few of the specific uses for Medusa Portland Cement Paint.

Portland Cement Stucco
Basements
Swimming Pools
Warehouses
Factory Walls
Tunnels
Train Sheds
Water Tanks
Smokestacks
Bridges
Garages
Grain Elevators
Dairy Plants
Stadia and Grandstands
Retaining Walls
and other uses

Literature

Send for our book "How to Paint Concrete and Masonry Surfaces," A.I.A. File 25c2, size 8½x11 in. Also our color-chip folder showing the colors and giving directions for use.

Pool at Mt. Lebanon, Pa.
Painted with Medusa Portland Cement Paint

Coast Guard Station, Milwaukee, Wis.
Painted with Medusa Portland Cement Paint

SOUTHWESTERN PORTLAND CEMENT COMPANY

OSBORN, OHIO

PLANTS

OSBORN, OHIO | VICTORVILLE, CALIF. | EL PASO, TEX.

Products

MIAMI Hydro-Plastic CEMENT

MIAMI HYDRO-PLASTIC CEMENT: a waterproofed high-early-strength Portland Cement for producing plastic, waterproof concrete.

Also Miami Akcelo Cement: a high-early-strength true Portland Cement for producing concrete ready for use in 24 to 72 hours; Miami Cement: a standard Portland Cement of high strength, surpassing in 7 days the 28-day strength specification for portland cement.

For Miami Richmortar, a masonry cement with a portland cement base, see Manufacturers' Index.

Hydro-Plastic Cement

Hydro-Plastic Cement is a finer ground portland cement with which a patented compound has been thoroughly incorporated during the grinding process. The finished product has increased waterproofness, plasticity and early strength properties. Its uniformity and simplicity of use reduce the need of costly supervision by the architect.

Field of Use—(1) Where dense, watertight concrete is required; particularly in all concrete placed below grade.

(2) For exterior stucco and interior cement plaster.

(3) Where "quick use" concrete is desired.

Watertightness—Concrete made with Hydro-Plastic Cement is free from honeycombing either internal or external. The concrete has the maximum density possible with the materials used which assures minimum porosity and maximum watertightness. The added compound is water-repellant which reduces absorption and corrosion of the reinforcing steel.

Plasticity or Workability—Concrete made with Hydro-Plastic is easy flowing and non-segregating. It remains homogeneous both during and after placing in the forms. The mix flows easily into all corners of the forms and around the reinforcing steel. Miami Hydro-Plastic Cement provides the ideal combination for obtaining durable concrete—a cement paste of high strength and sufficient body to adequately "float" the aggregate particles.

Mortar for stucco or masonry made with Hydro-Plastic is highly impervious to moisture. The addition of hydrated lime is not required to produce a smooth, easy-working mortar.

High Early Strength—Concrete made with Hydro-Plastic is ready for use 24 to 72 hours after placing, depending on the temperature and the amount of mixing water used. No change of concreting methods is necessary. Strengths obtainable with average aggregates at a minimum curing temperature of 70° F. are given in the following table:

Mixing water, U. S. gals. per sack cement	Compressive strength		
	1 day	7 days	28 days
5.0	2000	4000	5000
6.0	1500	3200	4000
7.0	1000	2800	3500

Note: Mixing water includes water in the aggregates.

Physical Properties of Hydro-Plastic

Fineness: 95% through 200-mesh.
Initial setting time: 2 hours 30 minutes.
Final setting time: 4 hours 30 minutes.
Normal consistency: 26.0%.

LABORATORY TESTS—H. C. NUTTING CO., CINCINNATI, OHIO

Pounds per square inch
Standard Mortar: 1 Cement—3 Ottawa Sand

	1 day	3 days	7 days	28 days
Tension	373	413	478	509
Compression	2234	3014	3547	4957

Hydro-Plastic Cement is guaranteed to conform to all chemical and physical requirements of the standard specifications for portland cement of the American Society for Testing Materials.

Specifications for Watertight Concrete

(1) Use not less than 6 sacks Hydro-Plastic Cement per cubic yard of concrete.

(2) Use not more than 6½ gal. of mixing water per sack cement (including moisture in the aggregates).

(3) Mix each batch at least 1½ minutes.

(4) Concrete mixtures must not be too dry or too wet. A mushy or quaky consistency that will flow sluggishly when spaded is the best.

(5) Placing must be done with special care for watertight work. The concrete must be deposited as rapidly as possible in shallow, even layers, working up to the full height of the forms as the placing progresses.

(6) Exposed surfaces should be kept moist for 7 days or longer following placing.

Complete Specifications for mass concrete, swimming pools, dustless floors, stucco, etc., will be gladly supplied on application.

Central Police Station, Columbus, Ohio
ALLIED ARCHITECTS ASSOCIATION, Architects, Columbus, Ohio
BOYAJOHN & BARR, General Contractors, Columbus, Ohio

WEST PENN CEMENT COMPANY

Manufacturers of West Penn Cement, West Penn Waterproofed Cement and Overnight Cement

BUTLER, PA.

BRANCH OFFICE, 2215 Oliver Building, PITTSBURGH, PA.

PLANT: WEST WINFIELD, PA.

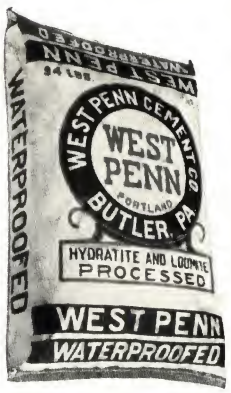
Products

West Penn Waterproofed Cement for use in all work where integral waterproofing or waterproofed cement is required.

West Penn Portland Cement.

Overnight Portland Cement.

Distributors of Flamingo Mortar Cement.



Description

West Penn Waterproofed Cement is West Penn Portland Cement made waterproof by the Hydratite and Loomite Process.

Hydratite is made by the A. C. Horn Co. and has been recognized as a standard of integral waterproofing for twenty-three years. The integral method is a designation first adopted by the A. C. Horn Co. Calcium and aluminum stearates are the bases of Hydratite Powder.

In U. S. Bureau of Standards Technological Paper 370 on a study of wet walls and the prevention of efflorescence on face brick walls it states on page 594 that "calcium and aluminum stearates were effective in all cases."

Loomite is finely pulverized Rensselaerite which has been extensively used to increase the plasticity and density of concrete.

Advantageous Features

(1) Comprehensive tests for both high and low pressure permeability have demonstrated the superiority of West Penn Waterproofed Cement. Upon request, we shall be pleased to furnish the architect with authoritative test data on West Penn Waterproofed Cement compiled from testing laboratory results.

(2) The concrete is extremely plastic and easy to place avoiding segregation.

(3) The required degree of workability can be secured with a lower water ratio.

(4) Concrete of very high early and ultimate strength is produced.

(5) Since the waterproofing elements are ground into the cement at the mill, there is no necessity for special supervision.

Uses

West Penn Waterproofed Cement will give positive waterproof and dampproof results in the construction of

Concrete reservoirs	Basement walls and floors
Cisterns	Elevator pits
Swimming pools	Stucco
Pumping stations	Cement blocks
Tunnels	Cast stone
Disposal plants	Roofing, tile, etc.

Integral Method of Waterproofing

The necessity of preventing the absorption of water by concrete has been recognized for many years.

Concrete contains many microscopic pores or capillary tubes constituting a considerable part of its total volume. Water enters concrete because of the physical law of capillary attraction.

In the process of manufacturing West Penn Waterproofed Cement, the Hydratite and Loomite are ground into the cement producing a complete and uniform distribution of these materials which become an inseparable part of the concrete itself. These materials lubricate the particles of cement and aggregate producing a denser concrete and at the same time tightly seal the minute pores or capillary tubes.

West Penn Waterproofed Cement will positively and permanently dampproof and waterproof concrete.

Advantages of the Integral Method

The integral method of waterproofing is economical because it does not require additional excavation on the exterior of foundation walls, nor additional brick or concrete protecting walls.

No difficulty is experienced in making joints around pipes or where horizontal or vertical joints occur. Blind leaks are not possible in integral waterproofing and leaks due to settlement cracks can be easily repaired.

Specification and Application

West Penn Waterproofed Cement should be specified, mixed, poured and cured in the same way as ordinary portland cement.

The only precaution is that each batch should be mixed one and one-half minutes minimum.

Shipments

West Penn Waterproofed Cement is furnished in 94-lb. paper bags and can be shipped in mixed cars with West Penn Cement, Overnight Cement and Flamingo Mortar Cement.

Service

We will be glad to have our field men furnish further information and visit construction work while West Penn Waterproofed Cement is being used.

Literature

Literature, in standard size, 8½x11 in., describing many uses for West Penn Waterproofed Cement will be sent on request.

THE CARNEY CEMENT COMPANY

MANKATO, MINN.

DISTRICT SALES OFFICES

CHICAGO, ILL., Builders' Building
CINCINNATI, OHIO, Carew Tower
DETROIT, MICH., Book Building
MINNEAPOLIS, MINN., Builders' Exchange
ST. LOUIS, MO., Louderman Building

MILLS: MANKATO and CARNEY, MINN.
QUARRIES: CARNEY, MINN.

CEMENT THAT IS WATER REPELLENT, NON-EFFLORESCENT AND INSTANTLY PLASTIC

CARNEY CEMENT
for Brick and Tile Mortar

Tests

For two years the laboratories of THE CARNEY CEMENT COMPANY were engaged in the difficult task of producing a waterproof cement that would control efflorescence and water absorption through mortar joints. The success of their efforts has been clearly demonstrated by a series of tests, the results of which are pictured below.

The brick specimen laid up in the new Carney Cement, which is marked by the star, is displayed together with six specimens using non-waterproofing cement.

The mortar for all was mixed one part cement to three parts sand by volume. The same quality brick was used in all cases. The sand and water were identical and all specimens were exactly the same age.

All bricks were set in a solution of sodium sulphate (a common cause of efflorescence) to a depth of ½ in. for a period of 48 hours. In every case, except in the Carney specimen, the sodium sulphate solution was drawn up by capillary attraction through the mortar joints into the top bricks.

In the Carney specimen, the absorption was fully checked at the mortar joint which emphatically demonstrated two things—the complete watertightness of Carney Cement and the resulting control over the spread of efflorescence.

In addition to producing watertight, efflorescence-resisting joints, Carney Cement mortar now attains its full smooth working properties the moment it is mixed. It requires no soaking or slaking on the job—and the addition of lime is not necessary.

Other Advantages

The simple mixing formula of Carney Cement (one part Carney Cement to three parts sand and water) saves a great amount of time and labor on the job—and also avoids the danger of improperly mixed materials that is always present where more complicated formulas are employed.

Because of the more plastic and smoother working properties of Carney Cement mortar, the masons can lay considerably more brick per man per day, which lowers the masonry cost on every job materially.

Colored Mortar

This new Carney Cement has been thoroughly tested, both in the laboratories and on numerous jobs and found to carry mortar colors perfectly. The complete moisture repelling characteristic of the mortar prevents absorption and consequently resists fading.

Pioneers of the Industry

THE CARNEY CEMENT COMPANY has manufactured cement since 1883—and were the originators of masonry cement as it is known today. Carney is unlike other cements—it is made from a deposit of natural cement rock particularly adapted to the manufacture of highly plastic, truly hydraulic masonry cement. This rock contains the correct proportion of lime, combined chemically so that when the stone is burned and ground no further addition of lime is needed. The only materials added to Carney Cement are those that give the material its watertightness and its resistance to efflorescence.

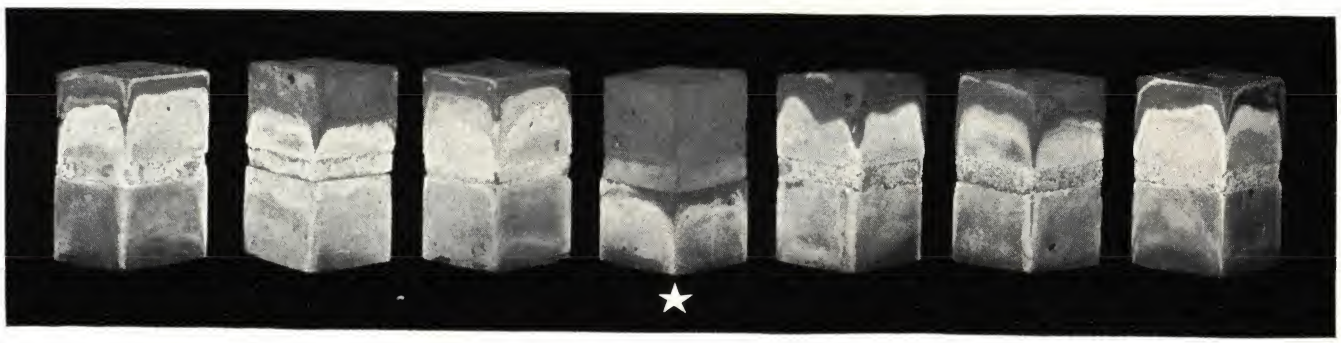
However, THE CARNEY CEMENT COMPANY maintains elaborately equipped, efficiently manned chemical laboratories for the purpose of assuring constant uniformity of the product.

Specifications

All mortar shall be composed of one part Carney Cement, manufactured by THE CARNEY CEMENT COMPANY, Mankato, Minnesota, and three parts clean, sharp, well-graded sand, mixed and measured by volume. The Carney Cement and sand, if mixed by hand, shall be mixed thoroughly in a dry state.

For machine mix put sand and a portion of water in machine first, then add Carney Cement, after which additional water shall be added to produce a mortar of the desired workability under the trowel. When color is added, an approved brand of good double strength color shall be used in accordance with the directions of the manufacturer of the particular color used. Color should always be used as an addition and not as a replacement of cement.

In warm weather common brick shall be wetted; in cold weather the sand and water shall be heated, and the wall units kept dry and free from frost before being placed in the wall. For parapet walls, chimneys and all masonry above the roof line, as well as other places requiring maximum strength, durability and load-bearing capacity the mixture shall be one part Carney Cement and two parts sand, mixed as above.



CENTURY CEMENT CORPORATION

Manufacturers of Century Waterproofed Masonry Cement

GENERAL SALES OFFICES
22 East 40th Street, NEW YORK, N. Y.
MINE AND MILLS: ROSENDALE, N. Y.

SALES OFFICES
NEW YORK, N. Y. PHILADELPHIA, PA. BOSTON, MASS. CLEVELAND, OHIO WASHINGTON, D. C.

Product

CENTURY WATERPROOFED CEMENT, the modern Masonry Cement for brick, tile, terra cotta, partition tile, cinder and concrete blocks, etc.

Physical Qualities

Century Waterproofed Cement is a very finely ground, highly plastic cement, that requires only the addition of sand and water to produce a perfect mortar for masonry of all kinds, above and below grade. It is a true hydraulic cement, manufactured from special cement rock deposits at Rosendale, N. Y., carefully proportioned with the same exactness that characterizes present-day manufacture of the finest portland cements.

Strength and Durability

The strength of Century Waterproofed Cement is greater than that required by the building codes of the various cities. It increases with age until its final hardness exceeds that of the brick it joins.

The high flour content of Century Waterproofed Cement imparts excellent plasticity with a *low water ratio,* which latter insures greater early strength, *no shrinkage in mortar joint* and a resulting strong bond. It also adds greatly to the stability of the new wall when subjected to freezing conditions.

Century Waterproofed Cement is particularly outstanding in its toughness, adhesiveness and durability. It passes all soundness tests and has ample strength for all classes of masonry work, large and small.

Color

The natural color of Century Waterproofed Cement is a pleasing gray, which, being neutral, harmonizes excellently with all types and shades of brick. It will satisfactorily carry any good grade of mineral mortar color.

Waterproofed and Non-Effloresecent

A stearate is ground in Century Cement at the mill, assuring an effectively waterproofed mortar. This stearate is of the class recommended for the purpose by the U. S. Bureau of Standards—Technologic Paper No. 370, page 579; the American Face Brick Association and other important authorities.

We illustrate a test made on April 1, 1930, by the James H. Herron Co., Chemists and Engineers of Cleveland, Ohio, on one pier of common clay brick and one of face brick. The bottom brick in each pier stands in a solution of sodium sulphate. *No absorption of the solution beyond the first brick.* Ample proof of Century Cement's impermeability.

Century Waterproofed Cement prevents seepage of crystallizing salts from one brick to another, and is free from such salts or other injurious chemicals which can cause efflorescence and fading of mortar color.

CENTURY CEMENT
WATERPROOFED FOR MODERN MASONRY

Uniformity

Century Waterproofed Cement is manufactured in one of the most modern cement plants, equipped with production machinery and scientific control methods which mark the highest achievement in the industry.

Absolute uniformity of strength and color assured through hourly tests, made under direct supervision of highly skilled chemists having every necessary facility at their disposal in a most modern and complete chemical and physical laboratory.

Ernest E. Berger, Chief Chemist, who developed and perfected Century Waterproofed Cement, was for many years identified with the U. S. Bureau of Standards at Washington, D. C., and the U. S. Bureau of Mines at New Brunswick, N. J., in chemical research and scientific investigation of ceramics and rock products.

Specifications

Mortar—For all brick, tile, terra cotta, partition tile, cinder and concrete blocks—1 part Century Waterproofed Cement to 3 parts clean, sharp sand—mixed and measured by volume. The Century Waterproofed Cement shall be mixed thoroughly while dry with the sand, either by hand or machine, thereupon adding clean water in sufficient amount to produce a mortar of the desired consistency. In warm weather, low burned brick shall be wetted thoroughly; in cold weather, sand and water shall be heated and brick and tile kept dry before placing them in the wall.

Colored Mortar—Where mortar color is required, a good double strength mineral mortar color shall be used, in accordance with the directions of the manufacturer of the particular mortar color used.

Cost

Although a straight cement mortar, Century Waterproofed Cement costs less than most mortars of comparable strength and quality, because it is economically prepared and used, and requires the admixture of only one additional material—sand. It is unusually plastic under the trowel, enabling the mason to work with a maximum of speed and accuracy. If specified originally and figured upon competitively, masonry bids should be lower.

It requires approximately 4 to 5 sacks of Century Waterproofed Cement to lay 1000 bricks, depending upon size of mortar joint. It also requires less mortar color per 1000 brick than is ordinarily used with other cements or limes.

A Few References

River House (30 stories), New York, N. Y.
Bottomley, Wagner & White, Architects, New York, N. Y.
Philadelphia Savings Fund Bank Building (38 stories), Philadelphia, Pa.
Howe & Lescaze, Architects, New York, N. Y.
Medical Tower Office Building (34 stories), Philadelphia, Pa.
McIlvain & Roberts, Architects, Philadelphia, Pa.
Earl Carroll Theatre, New York, N. Y.
Thos. W. Lamb, Architect, New York, N. Y.
American Museum of Natural History (3 bldgs.), New York, N. Y.
Trowbridge & Livingston, Architects, New York, N. Y.
N. Y. C. R. R., Melrose Office Building and other N. Y. C. buildings
New York Central R. R. Co., Architects, New York, N. Y.
Mayflower Hotel, Akron, Ohio
Graham, Anderson, Probst & White, Architects, Chicago, Ill.
County Jail, Albany, N. Y.
Howard Rogers, Architect, Albany, N. Y.
Flynn Building, Burlington, Vt.
Mowll & Rand, Architects, Boston, Mass.
Polsky Department Store, Akron, Ohio
Starrett & Van Vleck, Architects, New York, N. Y.
Central Savings & Trust Co.'s Tower, Akron, Ohio
Walker & Weeks, Architects, Cleveland, Ohio
Paramount Theatre, Boston, Mass.
Arthur H. Bowditch, Architect, Boston, Mass.

The Mill at Rosendale, N. Y.

DEWEY PORTLAND CEMENT COMPANY

GENERAL OFFICE
KANSAS CITY, MO.

SALES OFFICES
DAVENPORT, IOWA — MINNEAPOLIS, MINN. — OKLAHOMA CITY, OKLA.
OMAHA, NEB. — TULSA, OKLA.

PLANTS: DEWEY, OKLA. and DAVENPORT, IOWA

Products

DEWEY MASONS CEMENT: a cement manufactured especially for masonry mortar.

Also Dewey Portland Cement: a high quality portland cement for all concrete construction.

DEWEY MASONS CEMENT

A Cement for Mortar

Dewey Masons Cement is a hydraulic cement manufactured especially for mortar to be used in laying up brick, block, terra cotta, tile or stone masonry. It fills every demand required of a masonry cement, yet has none of the disadvantages so common to ordinarily used materials or combinations of materials.

Spreads Easily and Rapidly

Dewey Masons Cement is made entirely from minerals by a perfected formula in which the plasticity is secured during manufacture. When properly mixed, it will work smoothly and easily under the trowel.

Strength to Spare

The compressive strength is greater than ever required by building codes or the United States Government specifications. Dewey Masons Cement is like Dewey Portland Cement in that it becomes stronger with age.

Test sheets will be furnished on request.

Perfect Bond

Dewey Masons Cement has excellent bonding properties, does not shrink and becomes an integral part of the masonry. A good bond is important both from the standpoint of watertight walls and stability of the structure.

Watertight Joints

Because of its perfect bond and density Dewey Masons Cement will make watertight joints. Good workmanship, full vertical joints and completely bedded masonry units are essential.

Pleasing Natural Color

Dewey Masons Cement makes a soft toned, light gray mortar, blending well with all types of masonry.

Produces Attractive Colored Mortar

When pure mineral pigments are mixed with Dewey Masons Cement, beautiful and permanent effects will be produced. Dewey Masons Cement is a mineral product. There are no injurious admixtures to cause fading or bleaching of the colors.

Below Grade Work

Dewey Masons Cement is a hydraulic cement and will set up under water the same as Dewey Portland Cement. For this reason it is especially suitable for below grade work.

Free From Efflorescence

The common causes of efflorescence or discoloration of the masonry are the soluble salts in the masonry materials. Dewey Masons Cement is free from water soluble ingredients and, of itself, will not cause efflorescence.

Setting Time Regulated

The setting time depends on the temperature and humidity. Laboratory tests of Dewey Masons Cement mortar show an initial set of three to four hours and a final set of five to six hours. In hot, dry weather the setting time will be less, while in cold damp weather the setting time will be longer.

Absolute Uniformity

Dewey Masons Cement is manufactured with the same precision and care that has established the enviable reputation of Dewey Portland Cement for the past twenty-five years.

Easy to Use

The usual proportions are one part Dewey Masons Cement and three parts sand measured by volume. Water is added until the proper consistency is obtained. When mixed by machine at least one to two minutes of mixing is required after all materials are in the mixer. When mixed by hand, the materials should be first thoroughly mixed dry and then again as the water is added.

Packed in Paper Sacks

Dewey Masons Cement is packed in paper sacks. Each sack contains one cubic foot, and there are four sacks to a barrel. The convenience and economy of using paper sacks is a well-known advantage.

How to Estimate Quantities

The quantity of Dewey Masons Cement required to lay up 1000 bricks depends on the thickness of the joint, the thickness of the wall, the kind of sand used, the richness of the mix, and whether or not the walls are flushed.

However, four to five sacks of Dewey Masons Cement will lay up 1000 bricks, depending on the variables mentioned.

Lowers Building Costs

Dewey Masons Cement comes to the job ready to use. It requires no soaking, slaking or addition of other materials. Its smooth working qualities result in faster work and satisfied workmen. It sticks together without loss of material. These savings will be reflected in building costs.

GREEN BAG CEMENT COMPANY

SUBSIDIARY OF DAVISON COKE & IRON COMPANY

Manufacturers of Plain and Waterproofed Cement and Integral Waterproofings

Oliver Building, PITTSBURGH, PA.

MILLS: PITTSBURGH, PA. and KENOVA, W. VA.

SALES OFFICES

CINCINNATI, OHIO, 622 Broadway NEW YORK, N. Y., 243 Graybar Building WASHINGTON, D. C., Colorado Building KENOVA, W. VA.

Products

Green Bag Non-staining Waterproofed Masonry Cement; Double Repellent Integral Waterproofing Powder; Plain and Waterproofed Gray Portland Cements.

Green Bag Non-staining Waterproofed Masonry Cement

Green Bag Non-staining Waterproofed Masonry Cement is an American puzzolan cement, developed with the intent of producing a cement that would embody all the essential qualities and characteristics of a perfect *non-staining* impervious cement. The chemical and physical reaction of each ingredient both individually and in combination form every desired function of an efficient non-staining cement.

Non-staining—A cement to be *non-staining* must contain not more than 0.030 water soluble alkali. The average content of Green Bag Non-staining Waterproofed Masonry Cement is 0.015. It is among the very few brands passing the above requirement.

Water Repellent—It is highly water repellent and produces a mortar impervious to water. Three per cent of Green Bag Double Repellent Integral Waterproofing Powder is ground into the cement at the mill. Three per cent rather than the usual two per cent is added to the cement to permit the further addition of lime when desired and still assure a perfectly impervious mortar.

Efflorescence—Efflorescence is totally eliminated when Green Bag Non-staining Waterproofed Masonry Cement is used. Efflorescence, a common fault in ordinary masonry mortars, is caused by water soluble salts present being thrown into solution and working their way to the surface there depositing in the form of efflorescence. The double repellent quality of the waterproofing does not permit this condition to exist.

Volume Change—Volume change or the continuous expansion and contraction of a mortar due to alternate absorption and expulsion of water should be kept within rigid control. Such continuous movement is prevented by the impervious qualities of a mortar produced from Green Bag Non-staining Waterproofed Masonry Cement.

Flexural Strength—The materials entering into this cement assure high compressive and flexural strengths, impossible with those types of cement which usually sacrifice one value or the other. A mortar of Green Bag Non-staining Waterproofed Masonry Cement is highly deflective, permitting it to withstand severe wind sway and wall movement.

Shrinkage—The shrinkage in a mortar made of this cement is practically negligible. Dial gauge measurements show it to be but a few ten thousandths of an inch.

Adhesion—It is highly adhesive and bonds readily with the masonry unit.

Plasticity—The cement is of exceptional plasticity working well and long under the trowel, permitting the striking of clean joints with a minimum of droppings. The high plasticity is attained through the exceedingly fine grinding of approximately 97% passing through a 200-mesh screen and also to the plasticizing qualities of Green Bag Double Repellent Integral Waterproofing Powder.

Color—The cement has a silvery white cast in its natural state. When formed in the mortar it is a true white. This exceptional whiteness adds life and lustre to a mortar color or mineral pigment when used with the cement.

Package—It is packed in 80-lb. paper sacks (1 cu. ft.) meeting all specifications for weight.

Compressive and Tensile Strengths—Both compressive and tensile strengths approximate those of Portland cement. The wide factor of safety permits its use for load-bearing wall construction.

POUNDS PER SQUARE INCH—1:3 STANDARD SAND

Days	Tensile strength	Compressive cubes (2x2 in.)
1	45	250
2	105	825
3	155	1200
7	235	1792
28	280	2350

Set—The average initial set, 3 hours 50 minutes. Average final set, 7 hours 10 minutes.

Uses—All masonry mortar, exterior or interior stucco, facing concrete block, cast stone, garden furniture, grouting of tile or mosaics.

Specifications for Green Bag Non-staining Cement

Stone Setting, Pargeting and Back-up Mortar—
Where evenly graded sands are available:
1 part Green Bag Non-staining Waterproofed Masonry Cement.
3 parts clean, sharp sand.
Where unevenly graded sands are avilable:
1 part Green Bag Non-staining Waterproofed Masonry Cement.
½ part hydrated lime or lime putty.
4 parts clean, sharp sand.
Where more poorly graded sands are available:
1 part Green Bag Non-staining Waterproofed Masonry Cement.
1 part hydrated lime or lime putty.
5 parts clean, sharp sand.

Pointing Mortar—
1 part Green Bag Non-staining Waterproofed Masonry Cement.
2½ parts clean, sharp sand.
Sufficient lime putty for a stiff consistency.

Face Brick Mortar—
Follow same specification as for stone setting mortar.

Stucco Mortar—Scratch and Brown Coats:
1 part Green Bag Non-staining Waterproofed Masonry Cement.
⅛ part (by volume) hydrated lime.
3 parts clean, washed sand.

Stucco Mortar—Finish Coat:
1 part Green Bag Non-staining Waterproofed Masonry Cement.
½ part (by volume) hydrated lime.
4 parts clean, washed sand.

Tile and Mosaic Grouting—
1 part Green Bag Non-staining Waterproofed Masonry Cement.
1 part white marble flour or Silex.

Concrete Block, Cast Stone and Garden Furniture Facing—
1 part Green Bag Non-staining Waterproofed Masonry Cement.
1 part (light colored) gray portland cement.
5 to 6 parts clean, sharp white sand.

Special Recommendations for Setting, Backing, and Pointing Indiana Limestone—*The low cost of this cement permits its use throughout the exterior wall. No pargeting is necessary. The stone setter needs but one mortar on the board. Both labor and material costs are greatly reduced.*

Green Bag Double Repellent Integral Waterproofing Powder

A quality calcium stearate plus an inorganic plasticizer which combination assures thorough density of the mass in addition to the high repellency.

Green Bag Gray Portland Cement Waterproofed

Our standard brand of gray Portland cement into which 2% of double repellent integral waterproofing powder has been ground into the cement at the mill.

Green Bag Gray Portland Cement

A highly burnt, finely ground quality cement, having both high early and ultimate strengths.

Mixed Car Shipments

All Green Bag products are obtainable in mixed car shipments, a desirable convenience to contractor and dealer.

HY-TEST CEMENT CO.

A Plastic Bricklayer's Cement—Waterproofed at the Mill

MAIN OFFICE
PHILADELPHIA, PA.

SALES OFFICES
NEW YORK, N. Y. WASHINGTON, D. C. BOSTON, MASS. RICHMOND, VA. PITTSBURGH, PA.

Product

Hy-Test is the trade name of a Standardized Plastic Bricklayers Cement of a Portland Cement Base made especially for laying brick, stone, tile and other masonry units above and below grade.

MARK ON EVERY BAG

Advantages

It has been definitely proven that in order for mortar to produce the best results it must be sufficiently plastic to flow easily into the interstices of the brick and between the mortar joints. It is admitted that Portland cement works stiff and short under the trowel and is difficult to spread.

Hy-Test is so plastic that it is not necessary to add a bit of lime or other plasticizing agents. When mixed with sand and water it produces a mortar of such plastic workability as to promote good workmanship and well-filled joints which are essential for a watertight job and to prevent efflorescence. Its cohesiveness reduces slopping and streaking, and subsequent cleaning down with Hy-Test mortar is rarely necessary.

Hy-Test is the type of mason's cement that acts as a check against oversanding, as it will not carry more than the specified proportions of sand without loss of workability—and loss of workability increases the cost of labor. It is to the advantage of the mason not to oversand Hy-Test cement. The necessary plasticity can only be secured by using the specified proportions of cement. For this important reason alone Hy-Test is worthy of a place in the architect's specifications.

Color

Hy-Test is lighter in color than portland cement. It is a pleasing light buff shade. It will carry any good grade of mineral color without fading.

Estimating Data

It takes from 4 to 5 bags of Hy-Test cement to lay 1000 brick depending upon the thickness of the joint.

Strength

Hy-Test cement not only conforms to but will exceed the standards adopted by the American Society for Testing Materials and U. S. Government Federal Specifications No. 443 for masonry cements. It meets the building code requirements and has for 11 years been officially approved by the building departments of every first class city in the East.

Efflorescence

Efflorescence is caused by calcium sulphate in sand, brick and cement. The addition of a water-repellant to cement, by reducing the amount of moisture that gets into the wall and by preventing free movement of these salts will almost entirely prevent efflorescence from coming out. While Hy-Test contains no more soluble salts than found in any standard brand of cement it has ground into it at the mill a water-repellant. Thousands of existing Hy-Test installations over a period of 11 years are in evidence showing no efflorescence whatsoever, or in a few isolated cases less efflorescence than on surrounding buildings with other types of mortar.

Specifications

Mortar—An approved Masons' Cement of a Portland Cement Base equal to Hy-Test Waterproofed Masons' Cement shall be used for the mortar for all exterior and interior brickwork below and above grade, rubble stone, partitions, cinder and concrete blocks, in the proportion of one bag of masons' cement and not more than three cubic feet of clean graded sand. Fine loamy sand will not be permitted.

Masons' Cement shall be light grey in color similar to the average standard brands of portland cement. Waterproofing must be ground into the cement at the mill. Masons' Cement shall have have been on the market and used successfully for at least five years.

It is of utmost importance to thoroughly wet, before laying, brick that are porous and absorb water rapidly.

Some Important Installations for Your Inspection

New York Central R. R. Office Building, New York, N. Y.
Pennsylvania Railroad Building, Philadelphia, Pa.
Chanin Building, New York, N. Y.
Grant Building, Pittsburgh, Pa.
Fox Theatre, Detroit, Mich.
Roosevelt Hotel, New York, N. Y.
Press Club, Washington, D. C.
General Electric Co., Schenectady, N. Y.
Keystone Athletic Club, Pittsburgh, Pa.
Yale Bowl, New Haven, Conn.
University of Pennsylvania Stadium, Philadelphia, Pa.
Harvard University Business Buildings, Cambridge, Mass.
New England Telephone Co. Building, Boston, Mass.
U. S. Dept. of Commerce Building, Washington, D. C.
U. S. Army Barracks, Governors Island, N. Y.
U. S. Army Barracks, Fort Wadsworth, N. Y.
U. S. Cadet Barracks, West Point, N. Y.
U. S. Post Office, Scranton, Pa.
U. S. Post Office, Passaic, N. J.
U. S. Veterans Hospital, Bedford, Mass.
U. S. Veterans Hospital, Somerset Hills, N. J.
Pennsylvania State Highway Testing Laboratories, Harrisburg, Pa.
Pennsylvania State Hospital, Wernersville, Pa.
New Jersey State Hospital Buildings, Hillsdale, N. J.
New Jersey State Hospital, Morris Plains, N. J.
State of Connecticut Office Building, Hartford, Conn.
State of West Virginia Administration Building, West Liberty, W. Va.
State of West Virginia University Building, Morgantown, W. Va.
U. S. Naval Academy, Bancroft Hall, Annapolis, Md.
Massachusetts State Prison, Billerica, Mass.

KOSMOS PORTLAND CEMENT COMPANY

INCORPORATED

Manufacturers of

Kosmos Portland Cement Since 1905
Kosmortar (a Mason's Cement) Since 1922

SALES OFFICE
LOUISVILLE, KY.

MILLS
KOSMOSDALE, KY.

Kosmortar

A very smooth working cement for masonry of all kinds. Mixed with sand and water only, by hand or machine, it is ready for immediate use. No slaking, no additions. Minimum labor.

The Use of Kosmortar Insures Distinction in the Color of the Joint. Its natural color, a soft-toned, light gray, blends well with stone and terra cotta, and offers pleasing contrast to the colors in brick and tile.

Kosmortar Has Ample Strength for All Masonry. Its ultimate strength is greater than that of the brick. As there are no ingredients in Kosmortar that can form a film between the brick and mortar, tending to cause shrinkage cracks and leaky joints, its full strength is effective in the bond.

TRADE MARKS

"For all Concrete"

"For all Masonry"

ANALYSIS

SiO_2	16.00	Soundness: O. K.	
Al_2O_3	1.60	Setting time:	
Fe_2O_3	3.20	I. 3 hrs. 40 min.	
CaO	48.97	F. 6 hrs. 55 min.	
SO_3	4.20	Fineness:	
Loss on ignition	1.30	Passing 200-mesh sieve	89.58
Undetermined	1.41		

The Robert W. Hunt Company, Engineers, Chicago, report results completed May, 1931:

Tensile Strengths per square inch (1-3 Sand Briquettes)
3 days....135 lbs. 7 days....190 lbs. 28 days....258 lbs.

Strengths in Compression per square inch (1-3 Sand 2-in. cubes)
3 days....450 lbs. 7 days....559 lbs. 28 days...1490 lbs.

Uniformity is assured because the manufacture of Kosmortar is a completely controlled process. Kosmortar is portland cement compounded with other materials to give plasticity and body. It is not a natural cement product with the attendant possibilities of variation. Kosmortar has the reliability and durability of portland cement.

Watertightness—An admixture is used in Kosmortar for waterproofing purposes. When Kosmortar is used, the addition of water-repellent material is not required. Properly mixed with good sand, mortar made with Kosmortar will be dense, adhere tightly to the brick and prove effectively watertight.

Leaky walls are extremely rare when Kosmortar is used and when they do occur the trouble is usually caused by careless mechanical work, kind of brick or type of construction.

Colored mortar is readily obtained with Kosmortar by the addition of mortar colors. Lighter shades than the natural color of Kosmortar may be obtained by the addition of some mason's hydrated lime. Kosmortar will hold colors and will not cause efflorescence.

Setting time is regulated to give complete satisfaction for winter and summer use. There is a minimum of waste mortar and cleaning costs. Kosmortar sets hard under water (it is hydraulic) and is well suited to work below grade.

Kosmortar is economical to use and possesses qualities that satisfy the most stringent mortar requirements. A fair comparison with other cements used for masonry purposes will, we are certain, reveal the economy in specifying Kosmortar. Kosmortar is used as a non-staining cement.

Estimate of Quantity—Four to six sacks of Kosmortar (five sacks on the average) mixed with three parts good mason's sand, will lay 1000 bricks. The actual quantity depends on the quality of the sand, width of the joint, etc.

Package—Multiwall paper sacks are used exclusively. Each sack weighs 75 lbs. gross; 4 sacks make a barrel of 300 lbs., which is the unit of sale. 170 barrels is a minimum carload.

Directions for Use—Thoroughly mix as needed 1 sack Kosmortar with 3 cu. ft. good mason's sand, add clean water to proper consistency and use. Do not slake or soak.

Sand for all mortar should be well graded and with sharp angular particles, free from vegetable matter, loam (not over 5%) and large pebbles.

***Note:** Slaking and soaking are not only not required, but are detrimental.*

Model Specifications for the Architect's Use

(1) Mortar for all masonry shall consist of Kosmortar (Kosmos Portland Cement Company, Kosmosdale, Kentucky) with clean, sharp mason's sand alone, mixed in the proportion of 1 sack of Kosmortar to 3 cu. ft. of sand.

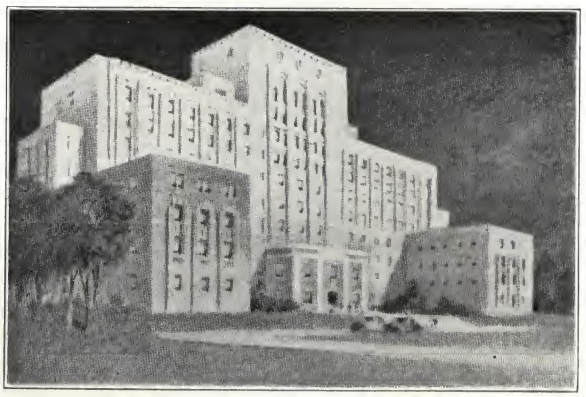
(2) Mixing is to be done by machine wherever practicable. If mixing is done by hand, the Kosmortar and sand shall be mixed dry until the whole is of a uniform color; then the water is to be thoroughly incorporated.

(3) Only enough clean water shall be added to give workable consistency.

(4) Kosmortar shall be delivered in the original containers.

(5) In cold weather the sand and water shall be heated to at least 70° F., and the work protected, if necessary, to assure setting of the mortar before the water in it freezes. Building units and sand containing any frost shall not be used.

(6) In hot weather, porous brick and tile shall be wetted before laying to prevent withdrawing from the cement the water necessary for hydration.



New Toledo Hospital Building
Schmidt, Garden & Erikson, Architects, Chicago, Ill.
A. Bentley & Sons Co., Contractors, Toledo, Ohio
Kosmortar used in the masonry work

Typical Kosmortar Jobs

Barracks Building, Fort Harrison, Ind.—U. S. War Department Plans and Specifications; Mead Construction Co., Contractors

U. S. Veteran's Bureau Hospital Buildings, Indianapolis, Ind.—Ralph Sollitt & Sons Co., Contractors.

Consumers Power Co., Jackson, Mich.—Albert Kahn, Architect; Henry Vanderhorst, Contractor

Cook County Criminal Court and Jail Buildings, Chicago.—Hall, Lawrence & Ratcliffe, Inc., Architects; Great Lakes Construction Co., Contractors

Hayswood Hospital, Maysville, Ky.—Samuel Hannaford & Sons, Architects; J. C. Simons, Contractor

Art Institute, Dayton, Ohio—Edward B. Green & Sons and Albert Hart Hopkins, Architects; Hillsmith & Co., Engineers and Builders.

Eli Lilly Co., Indianapolis, Ind.—Robert Frost Daggett, Architect; Leslie Colvin, Contractor

Owens Bottle Co., Kanawha, W. Va.—DeVore & Co., Engineers; Rust Engineering Co., Contractors

Lunkenheimer Co., Carthage, Ohio—Harry Hake, Architect; Fisher-De Vore, Contractors

LOUISVILLE CEMENT COMPANY

INCORPORATED

GENERAL OFFICES

Speed Building, LOUISVILLE, KY.

DISTRICT SALES OFFICES

CHICAGO, ILL., 1610 Builders Building — DETROIT, MICH., 600 Murphy Building — NEW YORK, N. Y., 101 Park Avenue

MILLS: BRIXMENT, N. Y., and SPEED, IND.

BRIXMENT for Masonry

Product

BRIXMENT, a mason's cement for brick, tile and stone masonry and for stuccoing buildings.

Brixment for Masonry

Brixment is a mason's cement that combines the characteristics of portland cement and lime, having both strength and plasticity.

When mixed with sand and water, it makes perfect mortar for any type of brick, tile or stone masonry.

How Used

The proper mix is 1 part Brixment and 3 parts sand, measured by volume, with water added for proper consistency.

Neither portland cement nor lime is necessary. The simple Brixment mix makes strong, smooth-working mortar.

Brixment can be mixed in any quantity either by hand or machine. It is ready to mix and use at once.

How to Estimate

Brixment is packed in cloth or paper sacks. Each sack contains 1 cu. ft. There are 4 sacks to a barrel.

When mixed with 3 parts of sand, a barrel of Brixment will lay between 800 and 1000 bricks, depending on the width of the joint. Therefore, 1000 bricks require 4 to 5 bags.

Uniformity

The use of Brixment is the architect's assurance that all mortar will be uniform in strength and color and that his specifications will be accurately followed. When oversanded, Brixment mortar works short and, since there is no lime in the mix, the necessary plasticity can be secured only by using the proper amount of Brixment.

Strength

Mortar made of 1 part Brixment, 3 parts sand (no lime, no portland) has greater strength than that required by the building code of any city for the heaviest load-bearing walls.

Its strength increases with age, becoming greater than that of the brick itself. When tested in piers, it approaches that of straight 1-to-3 portland cement mortar. This makes it suitable for foundation, load-bearing, or parapet walls and even for tall, free-standing stacks.

Brixment makes a stronger, tighter bond between the brick and the mortar; it is ground finer and hardens more slowly than portland, thus permitting deeper penetration and a more thorough keying into the pores of the brick.

Resists Moisture

When Brixment is used for mortar, no waterproofing admixtures are necessary. Brixment mortar alone is permanently water-repellent because an integral waterproofing material is intimately mixed with Brixment during manufacture. This material adds plasticity and prevents Brixment from air-setting and caking in storage.

Being a true hydraulic cement, water-repellent and used without lime, Brixment mortar is ideal for exterior masonry and walls below grade.

No Efflorescence

Efflorescence is due to the presence of salts in the masonry materials which work their way, in solution, to the surface of the wall and there crystallize. Brixment itself never causes efflorescence because it contains less than one-half of 1% of soluble salts.

Recent experiments at the U. S. Bureau of Standards show that the best way to prevent soluble salts which may be in the mortar materials from coming to the surface is to incorporate in the mortar a water-repellent admixture to resist the passage of such salts in solution. The waterproofing material, mixed with Brixment during manufacture, *does just that.*

Mortar Colors

The permanence of the mortar color in the joint depends not only upon the pigment selected but upon the mortar with which it is mixed.

Brixment does not fade mortar colors. It contains none of the strong acids, alkalis or salts so frequently the cause of fading and of efflorescence in other mortars.

The waterproofing material combined with Brixment when manufactured is a further protection to the color because it prevents water from penetrating the mortar and leaching out the pigments.

Specifications

(1) All mortar shall be composed of Brixment, manufactured by the LOUISVILLE CEMENT COMPANY, and sand. (2) The mortar shall be mixed by measure in the proportions of 1 part Brixment to 3 parts clean, sharp sand. (3) The Brixment and sand shall be mixed dry until the color of the mass is uniform. Clean water shall then be added to make mortar of the proper consistency for the work to be done. All mortar shall be mixed by machine (or by hand for small operations where machine mixing would not be practicable). (4) If mortar colors are used, they shall be mixed with the mortar in the proportion and manner specified by the manufacturer of the particular color used. (5) In freezing weather the sand and water shall be heated.

Some Brixment Buildings

Biltmore Hotel, Miami, Schultz & Weaver, Architects
Apartment, Fifth Avenue at 70th Street, New York, R. Candela, Architect
Fisher Body Co. Plant, Cleveland, Albert Kahn, Architect
U. S. Railway Terminal Post Office, Chicago, Graham, Anderson, Probst & White, Architects
Children's Hospital, Pittsburgh, York & Sawyer and E. T. Mellon, Architects

SOUTHWESTERN PORTLAND CEMENT COMPANY

OSBORN, OHIO

PLANTS

OSBORN, OHIO | VICTORVILLE, CALIF. | EL PASO, TEX.

MIAMI

RICHMORTAR

A MASONRY CEMENT

Products

RICHMORTAR: a Cement for setting brick, tile, stone and masonry of all kinds.

Also Miami Akcelo Cement: a high-early-strength true Portland Cement for producing concrete ready for use in 24 to 72 hours; Miami Cement: a Standard Portland Cement of high strength surpassing in 7 days the 28-day strength specification for portland cement.

For Miami Hydro-Plastic Cement see page 164: a waterproofed, high-early-strength portland cement for producing plastic, waterproof concrete.

Characteristics of Richmortar

Strength—Richmortar is a mason's cement with a portland cement base, hence, has the high strength characteristics of Miami Cements. Other materials have been scientifically combined to provide a remarkable plasticity and sand carrying capacity.

Durability—Richmortar passes the same soundness test as portland cement. Exceptional strength, coupled with an integrally added water repellant, provides a mortar of maximum durability. Richmortar is always of uniform strength, color and plasticity because it is manufactured according to formula under strict laboratory control.

Plasticity—Richmortar spreads easily and smoothly under the trowel. Joints can be struck cleanly and accurately, enabling masons to lay more brick per day.

Watertightness—Porous mortar joints are the cause of unsightly efflorescence, damaged interiors and spalling through frost action. Positive assurance against these evils is provided by the portland cement content of Richmortar, which furnishes a permanently impervious mortar.

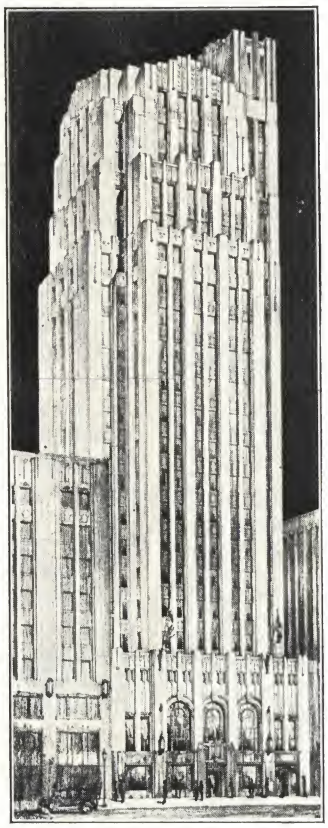
Economy—Richmortar, sand and water—only these three ingredients are required. The mortar is ready for use as soon as mixed. Richmortar stays easy working on the mortar board longer than ordinary mortars, eliminating costly and injurious retempering.

Simplicity—The architect or superintendent need not worry about any serious errors occurring at the mixing box. All the cementing materials are in one sack thoroughly mixed in the correct proportion. Strength will always be ample with a good grade of sand; for if the mix is overloaded with sand, the mortar loses plasticity. All masons realize it is poor economy to use a harsh, sandy mortar.

Color—Richmortar in its natural color is a soft, creamy white, which blends well with any color of brick. Mortar colors may be added without danger of efflorescence or fading because Richmortar contains no free lime or strong alkali.

Mixing—Richmortar is mixed either by hand or machine. One part Richmortar to three parts sand, add water and mix thoroughly to desired consistency.

Packing—Richmortar is packed in five-ply paper bags—75 pounds to the bag, four bags to the barrel. With the average sand, 5½ bags are required to lay 1000 brick with ½-in. mortar joint.



Mutual Home Building, Dayton, Ohio
SCHENCK & WILLIAMS, Architects
ENGINEERING CONSTRUCTORS, INC., Contractors

Physical Properties

Fineness: 90.0% through 200-mesh.
Soundness: O. K. five hours over steam.
Initial setting time: 3½ hours.
Final setting time: 7.0 hours.

REPORT OF STRENGTH TESTS

Pounds per square inch
Standard Mortar: 1 Cement—3 Ottawa Sand

Age—days	Tension Forest City Testing Lab., Cleveland, Ohio	Compression H. C. Nutting Lab., Cincinnati, Ohio
3	130	1223
7	167	1504
28	220	1913

Richmortar is guaranteed to meet Federal Specification SS-C-181, for Cement; Masonry.

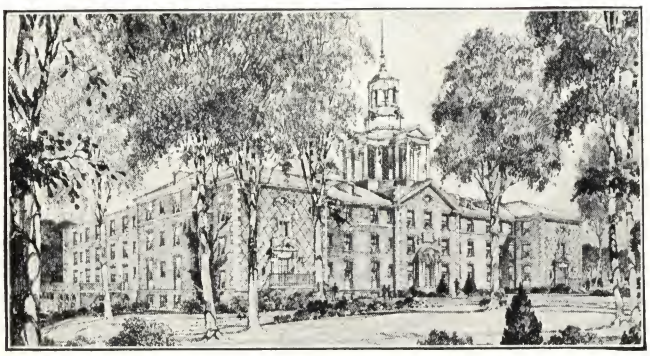
Specifications

(1) All masonry mortar shall be composed of Miami Richmortar (SOUTHWESTERN PORTLAND CEMENT COMPANY, Osborn, Ohio) and sand mixed in the proportion of one sack RICHMORTAR to not more than three cubic feet of clean sand. Add sufficient clean water to make mortar of desired consistency and mix thoroughly.

(2) In freezing weather, water and sand shall be heated and other protective measures taken, if necessary, to prevent freezing of the mortar before it has set.

(3) When mortar color is used, it shall be mixed with the mortar in the manner and proportions specified by the manufacturer of the color used.

(4) In hot weather, wet all masonry units (brick, tile, concrete block, etc.) before laying in the wall.



Stuyvesant Hall, Ohio Wesleyan University
WARNER & MITCHELL, Architects
W. J. SCHIRMER COMPANY, Contractors

Grace A. Green School, Dayton, Ohio
SMITH & CHAMBERLAIN, Architects
INDUSTRIAL BUILDING COMPANY, Contractors

CLINTON METALLIC PAINT COMPANY

Mortar Colors, Cement Colors, Protective Paints and Roofing Cement

100 Clinton Road
CLINTON, N. Y.

NEW YORK OFFICE: 19 Liberty Street—Telephone, John 3369

Products

Manufacturers of CLINTON MORTAR COLORS and CLINTON CEMENT COLORS. Also manufacturers of the following Clinton Specialties:

Clinton Silk Fibre Elastic Slaters Roof Cement
Clinton Asbestos Furnace and Retort Cement
Metallic and Venetian Roof and Barn Paints
Clinton Hermetic-Seal Liquid Roof Cement
Clinton High Temperature Fire Brick Cement

Send for descriptive literature and prices

Clinton Mortar Colors

Nature's Permanent Colors—Made Since 1887—at Clinton, N. Y.

Experience

Ever since 1887, the CLINTON METALLIC PAINT COMPANY has served the architectural profession and the building trade. Over 40 years of scientific research and generations of manufacturing experience are reflected in the uniform excellence of Clinton products.

Permanent and Uniform

Clinton Mortar Colors are mineral colors, as permanent as the colors in natural rock. Rigid laboratory tests keep them absolutely uniform from shipment to shipment and from year to year.

Directions for Estimating and Using Clinton Mortar Colors

To get a mortar joint of intense color it is advisable to use approximately 100 lbs. of dry mortar color per

Mortar Colored with Clinton Pompeiian Buff No. 600

Mortar Colored with Clinton Double Strength Olive Green No. 1503

Mortar Colored with Clinton Special Chocolate No. 404

Mortar Colored with Clinton Colonial Buff No. 700

1000 brick laid in running or common bond, with half-inch mortar joints. If mortar joints are wider or narrower, or if a bond requiring more or less mortar per 1000 brick is used, the amount of mortar color required per 1000 brick should be increased or decreased proportionately.

Following are two formulas for mortar of deep intense color:

Cement Mortar

Clinton Mortar Color (dry)	25 lbs.
Portland cement	1 bag (1 cu. ft.)
Sand	3 cu. ft.
Hydrated lime	1/10 sack

The above is sufficient to lay approximately 250 brick in running or common bond with half-inch mortar joints.

Cement Lime Mortar

Clinton Mortar Color (dry)	30 lbs.
Portland cement	1 bucket (16 qts.)
Hydrated lime	1 bucket (16 qts.)
Sand	6 buckets (96 quarts)

The second formula is sufficient to lay approximately 300 brick in running or common bond with half-inch mortar joints.

As it is not always convenient to weigh the color on the job, we tabulate below the various shades of Clinton Mortar Color, showing in separate columns the number of quarts of dry Clinton Mortar Color (*struck measure*) which are equivalent to 25 lbs. and 30 lbs.

Caution: *This table applies only to genuine Clinton Mortar Colors*

	Number of quarts	
	Equivalent to 25 lbs.	Equivalent to 30 lbs.
Clinton Hematite Red No. 10	10	12
Clinton Mortar Brown No. 400	8½	10½
Clinton D. S. Chocolate No. 402	9	11
Clinton Special Chocolate No. 404	9	11
Clinton Colonial Buff No. 700	19	23
Clinton Pompeiian Buff No. 600	19	23
Clinton Dark Buff No. 717	16½	20
Clinton Mortar Black No. 900	18½	22½
Clinton D. S. Black No. 800	19	23
Clinton D. S. Olive Green No. 1503	17½	21

Pearl Gray Mortar may be produced by using one-eighth as much Clinton Double Strength Black No. 800 as is recommended above to produce intense black mortar.

Clinton Mortar Black No. 900 or Single Strength Black, as it is sometimes called, will not give a jet black mortar. For best work use Clinton Double Strength Black No. 800.

For Cream Colored Mortar a cement lime mortar or a cement mortar made with white cement and sand should be used, adding about half as much Clinton Colonial Buff No. 700 or Dark Buff No. 717 as recommended above.

Many contractors get good results with smaller proportions of Clinton Mortar Colors than those above recommended. This is possible if coarse sand is used and all ingredients are mixed, remixed, then mixed again. Experience, however, proves that the amounts of color recommended will give good results under all conditions and we cannot assure satisfaction if less color is used. Money spent for a little extra color more than pays for itself, in power and wages saved at the mixer and in the owner's satisfaction with the finished job.

Clinton Pulp Colors

Many users of Mortar Colors desire the colors in Pulp form. Clinton Pulp Colors are of the same high quality as Clinton Dry Colors. Further detailed information with prices will be furnished upon request.

Specification

All coloring material to be manufactured by CLINTON METALLIC PAINT COMPANY, Clinton, N. Y., to be delivered on the job in original packages bearing their labels, and to be used according to directions which they will furnish.

Important Notes on the Preparation and Application of Colored Stucco

1. The Portland Cement Association, 33 West Grand Avenue, Chicago, will furnish any builder, without charge, detailed practical information concerning the preparation and application of colored stucco. Their instructions have been followed in the preparation of stucco panels reproduced below. The stucco was made in accordance with the following formula:

White Portland Cement	5 bags (470 lbs.)
Hydrated Lime	1 bag (50 lbs.)
Marble Dust	16 cu. ft.
Color	A weight equal to percentage of weight of cement indicated in table and under panels.

Any suitable white sand may be used in place of marble dust.

Shade	Clinton Color to be Used	Percentage of Color
Pink	Clinton Hematite Red No. 10	5 %
Pink	Clinton Red No. 82	1 %
Orange Pink	Clinton Red No. 61	1 %
Brown	Clinton Brown No. 1150	1.5 %
Deep Cream	Clinton Dark Buff No. 717	5 %
Cream	Clinton Colonial Buff No. 700	5 %
Light Yellow	Clinton Yellow No. 714	.75%
Light Green	Clinton Green No. 1502	1 %
Light Blue	Clinton Blue No. 1601	1 %

2. Any careful mechanic who will follow directions can prepare and apply colored stucco in a satisfactory manner.

3. Colored stucco appears much deeper in shade when wet than when dry. The change in color due to drying out of the stucco surface during the first few days after application must not be mistaken for fading. If Clinton Colors are used as suggested in our folder the final result should be closely similar to panels shown. Variations of fineness or color of the sand will account for such slight differences in color tone as may be noted. It is well to make up a small experimental batch, apply it, and let it dry out before proceeding with the work, thus proving that the color effect is satisfactory.

4. Write for our folder, "Color in Stucco," showing samples and giving more detailed information.

Background—No. 1502 Green 3%
Foreground —No. 61 Red 1%

No. 1601 Blue 2%

PECORA PAINT COMPANY, INC.

Mortar Stains and Sash Putty

TELEPHONE
Regent 6130

Fourth Street and Erie Avenue
PHILADELPHIA, PA.

ESTABLISHED 1862
By Smith Bowen

Products

PECORA MORTAR STAINS. PECORA METAL SASH PUTTY. PECORA CALKING AND GLAZING COMPOUND. PECORA COLORLESS WATERPROOF COMPOUND.

Also Mill White, Enamels, Lacquers, Furnace Cement, Stove Putty, Paints, and Varnishes (which are not described in this catalog). We will gladly furnish detailed information, testimonials and photographs on request.

Copyright, 1926, by Pecora Paint Co., Inc.

Pecora Mortar Stains

Uses—These stains are made to be mixed with lime or cement mortar or with the two combined, for facing exterior or interior brick walls regardless of the type of structure. Also for mantel facings, fireplaces and hearths, of brick, tile, marble, slate, or other material, for pointing or joining stonework, and for introducing color tones into exterior "whitewash."

Pecora Red Mortar Stain

Properties and Advantages—Pecora Mortar Stains are offered only in the form of a pulp or paste. They are manufactured from selected, finely-ground ores combined with extenders and fixatives making a non-acid solution. They hoe in with minimum handling and form a strong chemical union with the mortar. They produce tones that are rich, uniform, and fadeproof. They do not cause or increase efflorescence. Their strength makes them economical to use.

Pecora Dark Brown Mortar Stain

Colors—Special shades made to order. Stock shades as follows: Black, Brown, Dark Brown, Windsor, Red, Buff, Fern Green, Colonial Drab, Amber, Terra Cotta, French Gray.

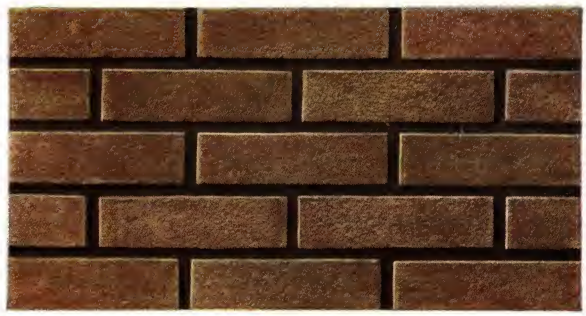
Specifications—Spotting, fading, and the necessity for tuck pointing may be avoided by the use of the following outline form:

All mortar to be colored or stained with Pecora Mortar Stain, manufactured by PECORA PAINT COMPANY, INC., Philadelphia, Pa., using by measure 1 bucket of paste or pulp to 7 buckets of face wall mortar.

Mortar must be cold before mixing in stain. To secure a uniform and smooth shade, "hoe in" stain thoroughly. Keep soft in package by covering with water. Pour this off before using. Do not allow stain to freeze before mixing with mortar.

Note: Depending upon depth of shade desired, the following proportions per 1000 brick, ordinary stretches, will be found to approximate quantity desired:

Red, Buff, Terra Cotta and Amber—For ⅛-in. joint use 45 to 55 lb.



Pecora Black Mortar Stain

Brown, Windsor, Colonial Drab, Fern Green, French Gray and Dark Brown—For ⅛-in. joint use 35 to 45 lb.

Black—For ⅛-in. joint use 20 to 30 lb.

Mortar varies and takes more or less stain according to richness of lime and quality of sand. Before laying brick it is suggested that a small portion of the stained mortar should be taken from the mortar bed and dried out thoroughly to determine whether the proper quantity of stain is being used to produce the shade desired.

Pecora Black Mortar Stain

Pecora Metal Sash Putty

Uses—Specially prepared for metal sash only.

Properties and Advantages—Pecora Metal Sash Putty is a plastic developed to replace white lead, litharge, and ordinary putties, and is compounded for permanent elasticity and adhesiveness, to take up the difference between co-efficients of expansion in glass and steel. It remains soft in the package and is "long" and requires no manipulation. Sample on request.

Colors—The standard shade is dark gray. Other colors made to order.

Specifications—The only safe way to specify metal sash putty is by name: Pecora Metal Sash Putty.

References—Typical installations of this material by David Lupton's Sons Co., of Philadelphia, Pa.:
Bethlehem Steel Co., South Bethlehem, Pa.
General Electric Co., Schenectady, N. Y., West Lynn, Mass.
Fore River Ship & Engine Building Co., Fore River, Mass.
Dayton Electric Company, Dayton, Ohio.
S. L. Allen & Co., Philadelphia, Pa.
Central Railroad of N. J., Elizabethport, N. J.
Keokuk Electro Metals Company, Keokuk, Iowa.

PECORA CALKING AND GLAZING COMPOUND; COLORLESS WATERPROOF COMPOUND

TRADE-MARK

Pecora Calking and Glazing Compound

A plastic material, impervious to heat, cold and moisture, or acid fumes. When set it forms a tough skin on the surface but remains permanently pliable and elastic underneath, never cracking or drying out. It adheres tenaciously to wood, stone, concrete, iron, glass, or any other building material, while its permanent elasticity adjusts itself, under all ordinary conditions, to contraction, expansion, or warping of the surfaces it joins. Its consistency is about that of putty and it is as easily applied. Stock color is light gray. Other shades furnished if ordered in not less than ½ barrel lots (400 to 500 lb.).

Air Leakage Prevention:—The prevention of air leakage is a vital prerequisite to fuel saving and satisfactory heating, and to the subsequent comfort of the occupants of a building. Approximately 90% of the air leakage in all buildings occurs between window and door frames and surrounding masonry. Unless these spaces are calked with a permanently flexible material in place of the usual mortar joint and cement pointing, air leakage is bound to continue.

Method of Calking Around Window and Door Frames:—This necessarily varies with the conditions to be found in old buildings. In some cases it is advisable to remove staff beads and calk space between the frame proper and the wall, while in other cases the calking can be done satisfactorily without removing staff beads. For this class of work a reliable calking contractor should be consulted; a list of these will be furnished on request. For calking frames in new buildings the following set of specifications, if rigidly enforced, will insure thoroughly weatherproof, windproof, and dustproof joints between frames and the surrounding masonry.

Specifications:—In the last paragraph of the general conditions to the specifications insert under the following heading:

Substitution of Materials, etc.—For material, apparatus, and appliances specified, other articles of equal capacity, material, designs, workmanship, and space occupied may be substituted, providing that the written approval of the architect shall be given before the general contract is signed. After contract is signed, no substitutions will be allowed. Samples of such substitutions shall be submitted before signing the general contract.

In specifications for stone, hollow tile, or brick masonry, insert this paragraph:

This contractor shall rake out the mortar before it is set ½ in. deep from outside face of door and window frames, on jambs top and under wood sills.

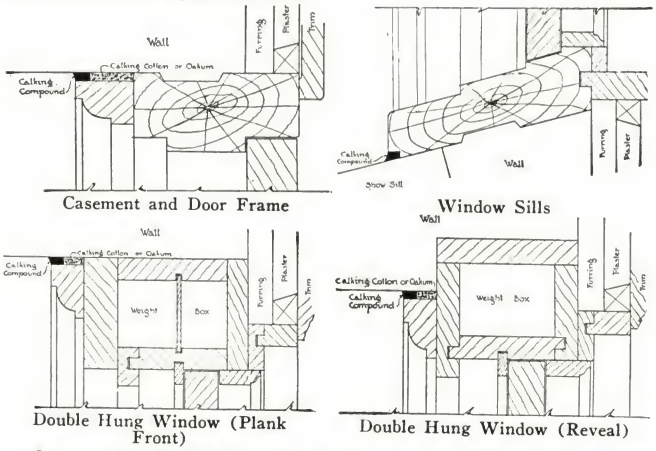
In specifications for carpenter and millwork insert this paragraph:

All staff beads on door frames and reveal window frames and back band moulding on plank front frames shall be loose and shall be put in place by the carpenter immediately after the calking is done.

In carpenter specifications after exterior door and window frames are specified add these paragraphs:

Calking—All exterior window and door frames shall be sealed with Pecora Calking Compound manufactured by the Pecora Paint Company of Philadelphia, Pa. This shall be executed so that the joint between masonry and frames (heads, jambs, and sills) will be rendered weatherproof, windproof, and dustproof, and guaranteed so to remain under all ordinary conditions for a period of 5 years from date of installation. When spaces between the frames and the surrounding masonry are wider or deeper than ½ in., these spaces shall be packed within ½ in. of frame surface with oakum and the remaining space filled solid with the calking compound.

The above work shall be done when all frames are set in place and primed and masonry joints raked out, as called for under masonry specifications.



Suggestive Details for Applying Moulds to New Frames and Undercut Sills to Accommodate Calking

Method of Pointing Stonework:—It is difficult, if not impossible, to get a cement mortar that will stand up in exposed joints in stone, terra cotta, or tile cornices. The cement cracks and becomes loose, causing leaks. To overcome this, set the masonry in portland cement in the usual way, but rake the joints back ½ in. before the cement hardens and fill in with Pecora Calking Compound.

In old work, clean the joints of all loose dirt or cement and grout with Pecora Calking Compound. This makes a positive seal against action of the weather on the cement, insuring permanently tight, waterproof joints.

Other Uses: Glazing—For any construction subject to severe conditions, such as excessive vibration, gas, acid fumes, extreme variations in temperature, etc., Pecora Calking and Glazing Compound should be used for bedding and glazing the skylights. Its permanent elasticity prevents the glass from cracking. It will go twice as far as white lead putty.

Consistencies:—Pecora Calking Compound is supplied in both knife and gun consistencies. The knife consistency is packed in 12½, 25, 50 and 100-lb. kegs; also in ½ barrels (400 to 500 lb.) and barrels (800 to 900 lb.). The gun consistency is supplied in 1-gal. can, 5 and 10-gal. kits, 30 and 50-gal. drums.

Pecora Colorless Waterproof Compound

Pecora Colorless Waterproof Compound is made of a combination of the best water-resisting and water-proofing materials that are known to science.

It dries rapidly to a flat, non-lustrous coating, which preserves, waterproofs and beautifies the surface. Does not stain or discolor.

Further information on request.

MORTAR COLORS

Manufactured by

C. K. WILLIAMS & CO.
Established 1878
Easton, Pa. Emeryville, Cal.

GEO. S. MEPHAM & CO.
Established 1887
East St. Louis, Ill.

RAW MATERIAL DEPOSITS AND SUPPLY PLANTS

CALIFORNIA OHIO ILLINOIS (3) PENNSYLVANIA (7) LOUISIANA WISCONSIN (2) MISSOURI (3) SPAIN (5) NEW YORK (2)

The C. K. Williams Company and the Geo. S. Mepham Company are an organization of world-wide magnitude and one of the world's largest producers of mineral pigments.

NON-FADING MORTAR COLORS

Anchor Brand

The growing popularity of Mortar Colors during the past decade is largely due to the following reasons:

(1) Mortar to Match Brick—Where particular color effects are desired, such as in brick panels of contrasting or harmonizing color or for interior work, especially hearths, mantels, etc., the effects are greatly increased by coloring the mortar to match the brick.

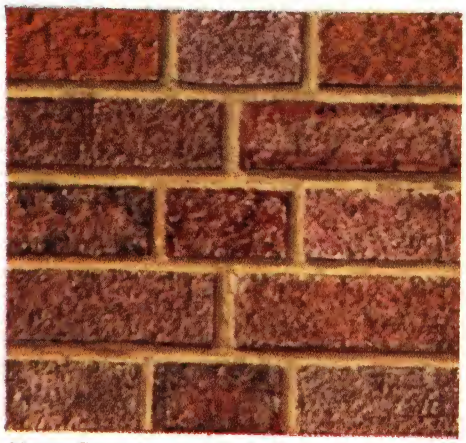
The American Face Brick Association standard specifications provide.

"The hearth shall be of (name) brick laid as per drawings in a 1:3 cement mortar to match the brick."

(2) For Mortar Contrasting with Brick—By laying the brick in mortar of a color and shade which will bring out the full value of brick texture and tone gradation, a beautiful effect is secured. Some combinations which have become very popular are as follows: rough texture variegated red brick with buff or chocolate mortar; red brick with black mortar; and smooth-surface light buff or yellow brick with red mortar.

Star Brand

Mortar Colored with Anchor Brand No. 1174 Double Strength Chocolate or Star Brand Double Strength Chocolate, Dk.



Mortar Colored with Star Brand Double Strength Buff or Anchor Brand No. 19 Buff

(3) For "Mellowing" the Mortar—One of the principal charms of old brick buildings is the warm and mellow tone of the mortar. To reproduce the charm of half-century-old mortar, a judicious use of mortar colors will prove most satisfactory.

(4) For Color Control—The color value of sand and cement varies greatly with the source of material. Our standard specifications provide architects with an exact method of color control.

(5) One-fifth of the Brick Wall Surface Is Mortar—Proportions vary, but in the ordinary wall with ½-in. mortar joints, approximately one-fifth of the wall surface is mortar. For this reason architects realize the necessity of selecting the mortar color with the same discriminating care that is used in the choice of the brick.

A Fifty Year Record

Anchor Brand and Star Brand Colors have a half-century record of quality and reliability. They are not only fadeless but they are more finely ground and better mixers with mortar. They are of the highest quality at no higher price. Brilliant colors can be used daringly if combined harmoniously, and if there is no danger of fading. When using these mortar colors you can be sure of artistic brick work.

Mortar Colored with Star Brand Double Strength Black or Anchor Brand No. 222 Double Strength Black

Mortar Colored with Anchor Brand No. 1151 Red or Star Brand Double Strength Red

Specifications for Star Brand and Anchor Brand Mortar Colors

The following paragraphs are to be inserted in the Brick Masonry specifications:

Mortar Color—Mortar color shall be Anchor Brand Mortar Color, manufactured by C. K. Williams & Co., Easton, Pa., or Star Brand Mortar Color, manufactured by Geo. S. Mepham & Co., East St. Louis, Ill., and delivered to the site in the original packages.

The exact quantity of color to be used will be decided by the architect after the construction of test panels.

Test Panel—Test or sample panels as required by the architect shall be constructed in the same manner and of the same thickness as the finished wall. Face brick for test panel shall be laid in mortar mixed according to the formula and directions given below. After test panels are thoroughly dry, the architect will decide whether the color of the mortar is satisfactory, or whether the amount of mortar color in the formula should be increased or reduced. *See Note (1).*

Mixing—Dry color, sand, hydrated lime and cement shall be thoroughly mixed before water is added. After the water is added, mixing shall continue until the mass is absolutely free from spots or streaks of color. Mortar shall be mixed as stiff as is practicable, and batches shall be kept as nearly as possible at the same consistency throughout the job. The same proportions of ingredients shall be accurately maintained in all the batches. The kinds of lime, sand, cement and color shall not be changed after the work has begun. *See Notes (2) and (3).*

Cleaning and Pointing—When plasterer has left building, all surface brick and mortar shall be thoroughly cleaned down by applying a solution containing not more than 1 part of muriatic acid to 20 parts of water, using a stiff wire brush. Surface shall then be rinsed with clean water. All defective joints shall be pointed up at this time. *See Notes (4) and (5).*

Notes to Specifications

(1) Omission of Test Panel—For smaller jobs where cost is an important consideration, the test panel may be omitted. In this case, a little of the mixed mortar may be taken from the first batch and pressed into a small cake. When this cake is dry, it can be determined whether the color of the mortar will be satisfactory.

(2) Lump Lime—If lump lime is used in place of hydrated lime, it must be thoroughly slaked and allowed to cool at least 24 hours before being brought in contact with mortar colors. *Hot lime bleaches color.*

(3) Accurate Mixing Necessary—Lime is a strong pigment; sand and cement also have an important effect on color. It is important to measure accurately and maintain same proportions throughout the work.

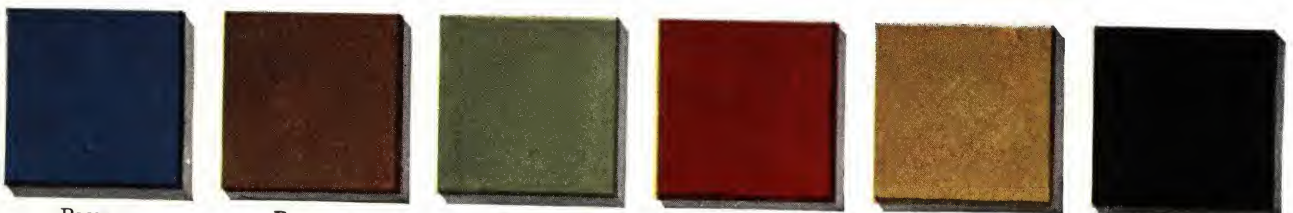
(4) Raking Joints—Defer raking till mortar has begun to set.

(5) Prevention of Efflorescence—If mortar is mixed stiff and raking of joints deferred till mortar has begun to set, efflorescence will rarely be found. Efflorescence is in no way caused by Star Brand or Anchor Brand Mortar Color. It is due to the occurrence of soluble salts in cement, sand, lime, water or the brick, and is just as common in plain mortar as in colored mortar, though not so easily visible.

To Secure Good Results

We recommend use of 100 lbs. of dry Mortar Color per one thousand brick laid in running or common bond with half-inch joints. We cannot assure satisfaction if less Color is used.

Anchor Brand CEMENT COLORS Star Brand



Blue | Brown | Green | Red | Yellow | Black

Star Brand and Anchor Brand Cement Colors

Are very finely ground and produce clear, bright tones with a minimum of coloring material. They are used in floors, sidewalks, cast-stone work, roofing and floor tile, stucco, etc., and should not be confused with mortar colors.

For Cement Floors—Although colored cement floors are comparatively inexpensive, they should never receive the treatment of a cheap floor. Colored cement, if carefully laid, finished and protected, will be found to possess all the decorative qualities of more expensive materials, along with the strength and economy of concrete. Specifications are shown below.

For Stucco—The popularity of colored or tinted stucco surfaces is increasing rapidly. Directions for the use of our stucco colors will be furnished on request.

Specifications for Coloring Cement Floors

Subfloors under colored cement topping should be specified as usual. It is well to use a fairly dry mix and tamp thoroughly. Allow 1 in. for top dressing, which should be laid immediately. The following paragraphs should be incorporated in the specifications:

Cement Floor—Cement color, wherever specified, shall be Anchor Brand Cement Color, manufactured by C. K. Williams & Co., Easton, Pa., or Star Brand Cement Color, manufactured by Geo. S. Mepham & Co., East St. Louis, Ill., and delivered to site in original packages.

Top Finish—A top finish not less than 1 in. thick shall be applied to floors in (state part of work), topping to be composed of 1 part cement and 2 parts of sharp clean sand, free from loam, and from 5 to 20 per cent of color, according to results desired.

Mixing—Cement, sand and color shall be thoroughly mixed before water is added. Only enough water shall be added to make a heavy paste. Mixing shall continue till the mass is absolutely free from spots or streaks of color.

Application—While base is still moist, top dressing shall be applied as follows: Trowel down about ½ in. of colored cement at a time, so as to work the air out of the mass. Build to the surface in this manner. Use the stroke board to chop the surface, as the mass will be too tough to stroke in the usual way. Take off any surplus with the trowel. Level the surface and let it lie till it becomes dull. Do not trowel until all water on the surface disappears.

Tile Effect (Optional)—48 hours after application of top finish, floors shall be cut ⅛ in. deep with a three-cornered file sharpened to a diamond point, so as to produce a tile effect in the pattern directed by the architect.

Note—Cutting floors while green will produce a ragged edge.

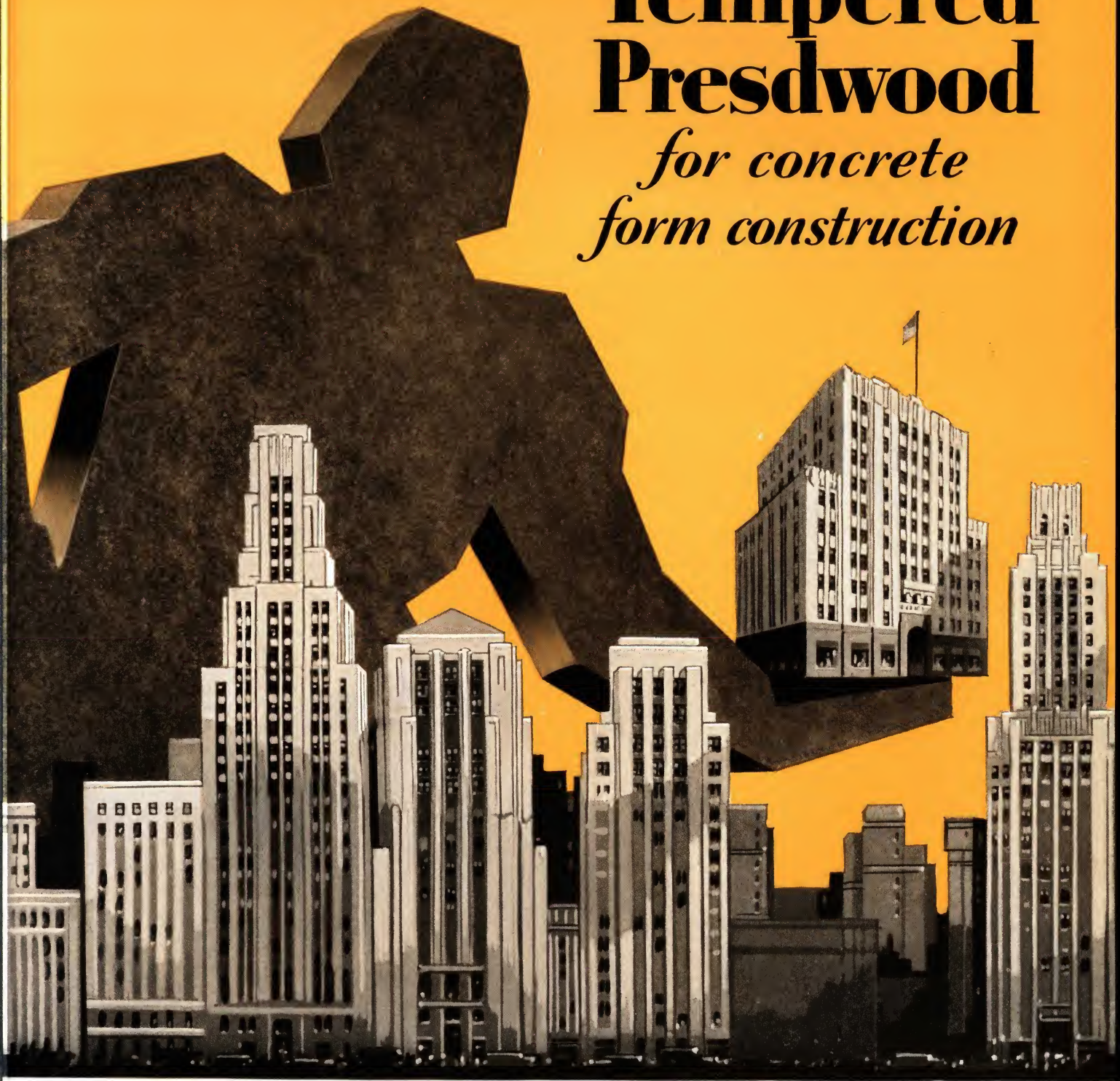
Protection—As soon as topping is sufficiently set, floors shall be covered with a 2-in. thickness of sawdust, which shall be kept wet for at least 2 weeks.

Cleaning and Waxing (Optional)—When protective coating is removed, the surface shall be washed with linseed oil soap, using a wire brush, if necessary, to remove dirt and stains. When clean and dry, the surface shall again be covered with a 2-in. thickness of sawdust.

Just before the floor is to be put into use, it shall be polished with a floor wax approved by the architect and applied in accordance with the manufacturer's directions.

Masonite Tempered Presdwood

for concrete form construction

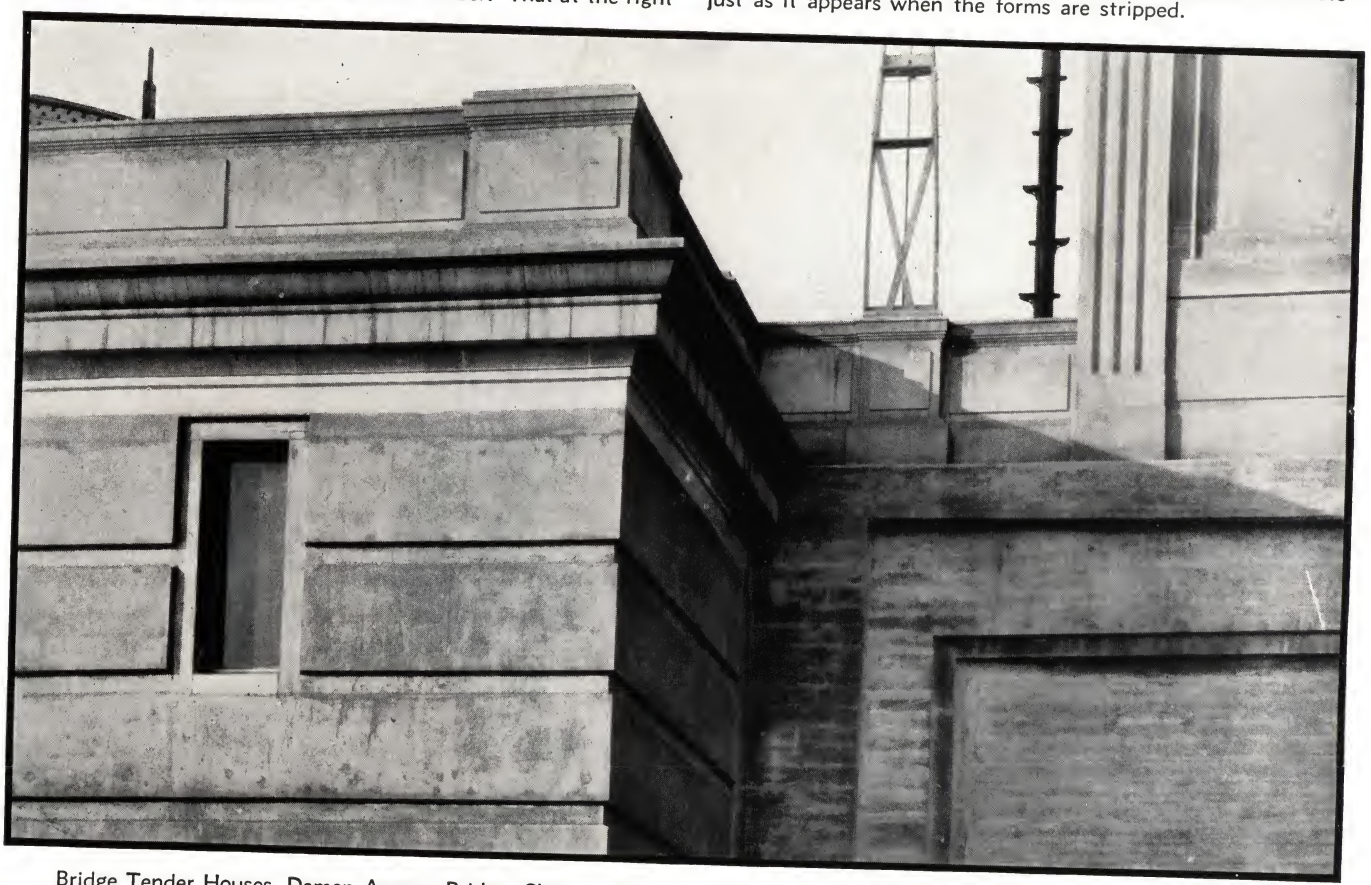


Masonite Corporation

111 W. Washington Street, Chicago, Ill.

TEMPERED PRESDWOOD FORMS FOR CONCRETE

The illustration above is from an untouched photograph of stripped concrete columns. The column at the left was formed with better than average standard form lumber. That at the right was formed with Masonite Tempered Presdwood Forms. Note the smooth finished surface of the "Form Finished Concrete" just as it appears when the forms are stripped.



Bridge Tender Houses, Damen Avenue Bridge, Chicago, Ill.; City Bridge Department of Chicago, Designers; Ralph H. Simpson Co., Chicago, Contractors. Compare the "Form Finished Concrete" of these rusticated walls with the adjoining concrete of the bridge approach formed with standard lumber forms. The Tender House Wall Forms were lined with Tempered Presdwood.

MASONITE CORPORATION

111 West Washington Street
CHICAGO, ILLINOIS

For Catalogues on Masonite Structural Insulation and Cushioned Flooring
See Sweet's Manufacturers' Index

TEMPERED PRESDWOOD FOR CONCRETE FORMS

INTRODUCTION

A New Material

The increasing demand and successful use of Masonite Presdwood for the lining of concrete forms to economically produce smooth, finished, exposed concrete surfaces, led the Research and Development Department of the Masonite Corporation to further develop and perfect this material to more particularly adapt it to this use.

The new material, *Tempered Presdwood,* should in no way be confused with the previously made board, still admirably adapted to many uses in building and other industries.

Tempered Presdwood is much denser, less absorptive and of considerably greater structural strength than Presdwood.

To the long and favorably known unique qualities of Presdwood have been added almost unbelievable new qualities of tough, wear-resisting ruggedness and strength.

The Company—Manufacturing Facilities

The Masonite Corporation has been continuously in business since 1925. All of its products, "Masonite Insulation," "Quartrboard," "Presdwood," the new "Tempered Presdwood" and "Masonite Cushioned Flooring" are all produced by the "Mason Process" of pure, clean wood fibre. All of the products are sold nationally through retail lumber merchants.

The Manufacturing Plant is located at Laurel, Miss., with an annual capacity of better than 200,000,000 square feet of its various insulation and board products. Reasonable stocks are always maintained at the factory to insure quick delivery for any size operation.

Form Designing Service

The Masonite Corporation maintain a corps of competent engineers to assist in the design and erection supervision of economical concrete forming based on the use of Tempered Presdwood.

MANUFACTURING PROCESS

Made Entirely of Wood

Masonite Tempered Presdwood is a manufactured board, made entirely of wood fibres by the Mason Process (Patented).

No binders are added and no chemicals are used in its manufacture.

Producing the Fibres

Clean wood chips (yellow pine) are exploded under high steam pressure. This first stage in the manufacturing process produces long cellulose fibres with their original strength unimpaired and the lignins or natural cementing constitutent of the wood entirely retained. The exploding process is purely physical, not chemical, and there is no change in the wood except that it is torn apart into exceptionally long fibres.

Felting

These clean, long fibres are next thoroughly felted together. The uncompressed felted sheet is 2¼ in. thick for the ⅛ in. thick Tempered Presdwood board and proportionately thicker for the greater finished thicknesses.

Compressing the Board

The felted fibre sheet is compressed into boards in steam heated, flat-bed hydraulic presses where they are subjected to hundreds of tons of pressure and at the same time to a very high temperature. In four ways the board thus produced is better than nature's own original material. It is both grainless and knotless, has greater moisture resistance and is much denser and tougher.

Tempering

The compressed or finished boards (Masonite Presdwood) are now treated or tempered by a newly developed process which adds unbelievably to their density, non-absorption, structural strength and toughness. The result is a board of absolute uniformity in thickness and physical properties. The face surface of the board is smooth and semi-polished and the back a screen-mesh-indented surface.

PHYSICAL CHARACTERISTICS

Size (Area)

The boards are uniformly 4 ft. x 12 ft. cut accurately rectangular in shape with smooth, sharp arrises.

Thickness

Form Liner Boards—⅛ in and $\frac{3}{16}$ in. thick.
Structural Form Boards—¼ in. and $\frac{5}{16}$ in. thick.

Weights

⅛ in. thick— 773 lbs. per thousand square feet.
$\frac{3}{16}$ in. thick—1093 lbs. per thousand square feet.
¼ in. thick—1380 lbs. per thousand square feet.
$\frac{5}{16}$ in. thick—1620 lbs. per thousand square feet.

Specific Gravity

The specific gravity of Tempered Presdwood is greater than Northern Hard Maple.

Absorption

Twenty-four hour immersion—water absorption 7%.

Structural Strength

Tensile Strength per square inch..... 7,320 lbs.
Modulus of Rupture per square inch....13,775 lbs.
Working stress per square inch..... 1,200 lbs.

ADVANTAGES AND ECONOMIES OF TEMPERED PRESDWOOD FORMS FOR CONCRETE

Form Finished Concrete—General Adaptability

Building Industry for years searched without success for a material wholly suitable for concrete form lining and structural forming which would leave the concrete surface in a smooth, finished condition without added labor and expense.

The development of Tempered Presdwood, a grainless, all-wood fibre board, has through actual use on practically every type of concrete structure, proven its entire practicability and adaptability for this purpose. Tempered Presdwood has all the advantages previously accredited to natural wood lumber with the elimination of all of its inherent disadvantages.

Smooth finished concrete surfaces, both for the interior and exterior, are obviously an economy and may be utilized to advantage in practically every type of construction where reinforced and mass concrete are adapted.

On the interior, Form Finished Concrete in columns, beams, girders and slabs forming ceilings requires no plastering or furred or suspended ceilings to cover up or make presentable the structural members. The finished concrete is practically ready for decorating when the forms are removed.

For subways, tunnels and similar construction, a dense, smooth concrete surface of excellent appearance is provided.

For exterior exposed building foundations and walls, Form Finished Concrete devoid of the usual form lumber disfigurations, has infinite possibilities. This is particularly true in the case of bridge piers, bridges and viaducts.

Tempered Presdwood has proven an ideal form surface for special-process exposed-aggregate concrete wall facings.

Tempered Presdwood boards may be formed to the average curves required for arches and vaults.

Elimination of Form Joints, Etc.

Due to the large area of the Tempered Presdwood units (4 ft. x 12 ft.), form joints, which would appear as disfiguring marks and fins on the concrete surface, are entirely eliminated. Where joints between boards are necessary, they can be practically obliterated if ordinary care is exercised in cutting the boards and matching and securing the edges at the butt. (The manufactured edges of Tempered Presdwood boards are straight and square with sharp, true arrises). No joint filler is required.

Since Tempered Presdwood is non-absorptive, it remains flat and smooth, even after repeated use. Much of the disfiguring form marks on exposed concrete in the past has been due to moisture absorption which has caused swelling, cupping and bulging of the individual boards of even the most carefully built wood lumber forms.

Uniformity

Tempered Presdwood boards are absolutely uniform in surface finish, density and strength and are accurately cut to dimension. The material is grainless and therefore has no tendency to split. The fibres are uniformly compacted throughout the entire thickness—it is not laminated or stratified, therefore it will not separate or flake transversely.

Light Weight—Easily Handled

While of great structural strength, the boards are thin (⅛, $\frac{3}{16}$, ¼ and $\frac{5}{16}$ in.) and weigh only 37 lbs. for 48 sq. ft. of ⅛ in., and 77 lbs. for 48 sq. ft. of ¼ in. Whether used as lining for wood forms or structurally spanning between wood supports, they are easy to handle and weigh less than any other material possessing comparable characteristics.

A Smooth Non-Absorptive Form Surface

The face of Tempered Presdwood is smooth and semi-polished. As a form material, it is exceedingly dense and practically non-absorptive, in consequence of which in actual use Tempered Presdwood does not swell and shrink—it remains, after repeated reuse, smooth and flat without buckling.

Retains the Correct Concrete Water Ratio

Forms lined with or built of Tempered Presdwood are tight and retain all of the pre-determined moisture within the forms assuring complete, uniform hydration of the cement and, therefore, better concrete. The full strength of concrete designed by the water ratio method is secured. There are few, if any, cracks or joints for the moisture to seep through and practically no moisture is absorbed by the form material.

Saves Form Lumber Costs

Only sound square edged form lumber need be used in conjunction with Tempered Presdwood—dressed and matched material may be entirely eliminated. Where Tempered Presdwood is used structurally the skeleton wood form bracing or backing may be so arranged as to require little, if any, cutting to length—the ends of alternate boards may be staggered and lapped. Since the Tempered Presdwood largely prevents the seepage or loss of water from the concrete, the wood bracing or backing lumber remains in good condition (out of contact with moisture) and with ordinary care in stripping and handling, the salvage and reuse is very considerably increased. Under average conditions 85% salvage of wood form lumber is not unusual.

Tempered Presdwood Endures Repeated Use

The greatest economy in forming may obviously be expected where the form units for floor arches or slabs, joists, beams, girders and columns are designed in sections for easy removal and repeated reuse on similar members. This is particularly so on floor constructions in multi-story buildings. Column form size reductions on successive stories are easily accomplished with a minimum loss of material and labor. Under actual form use Tempered Presdwood form units have been successfully reused from eight (8) to twelve (12) times when ordinary care is exercised in stripping, storing, handling and re-erection.

After the concrete has set sufficiently for form removal, Tempered Presdwood strips easily from the concrete surface.

Tempered Presdwood from large forms may be repeatedly cut down for use in smaller units.

On an average job, 5% is considered a generous allowance for wastage in cutting.

Wood Accessories for Architectural Effect

Where the design requires it, reverse wood moulding forms are easily and inexpensively added to Tempered Presdwood forms to provide ceiling panels, beam and girder crown moulds, beam soffit chamfers and panels and column chamfers. These accessories should be carefully fitted, particularly at miters and intersections and thoroughly oiled to reduce moisture absorption.

Sawing Tempered Presdwood

Tempered Presdwood, due to its density and grainless composition, is best cut with a power saw equipped with a four point steel-cutting blade. Such equipment will function efficiently under average conditions for several weeks without re-sharpening. For cutting Tempered Presdwood the saw blade should be set from ½ in. to ¾ in. above the set used for ordinary wood cutting. The pitch is considerably lengthened and is instrumental in speeding the cutting of Tempered Presdwood Board.

Type of Concrete Required

The best of exposed concrete surfaces can be obtained by a minimum of added care and expense in form construction and mixing and placing of concrete. Finished forms should always be inspected to insure tight butted joints of the Tempered Presdwood and that the forms are cleaned of any foreign substance clinging to the surface.

A uniform, extremely plastic concrete mix should always be used, well spaded to assure complete elimination of air and provide full contact with the form face. The whole mass should be puddled or agitated by artificial means where concrete is closely confined in comparatively narrow members.

Comparative Costs

The following comparative costs between the use of straight wood forms and forms lined with $\frac{3}{16}$ in. thick Tempered Presdwood were used by the chief engineer in charge of construction on a large dam in Maryland.

	Straight Wood Forms	Wood with Presdwood
Lumber	6.48	6.48
Finishing Concrete	32.40	0.00
Repairs to Forms	16.20	8.10
Stripping Labor	16.20	8.10
Presdwood (Material and Labor)	0.00	21.50
	71.28	44.18

The above figures are based on the building of a form section 12 ft. x 14 ft. using the wood frames ten (10) times and the Tempered Presdwood five (5) times. The unit costs are based on a total usable area of ten times the form area or 1680 square feet.

This engineer went further to state that he believed still greater economy could be effected with the use of Tempered Presdwood in forms for concrete buildings.

MASTER SPECIFICATIONS
Tempered Presdwood for Concrete Forms

Note: *Notes are explanatory or advisory only and are not to be included in the specifications.*

Note: *Select and include only those clauses which apply to the particular work. Words or clauses within brackets in italics are selective.*

GENERAL REQUIREMENTS

(1) Work Included

The following concrete surfaces shall be so executed that the exposed faces shall be "Form Finished," smooth and true, devoid of surface irregularities, disfigurement or markings without the necessity of rubbing, grinding, tooling or other mechanical finishing.

Note: *Here list and locate all areas of "Form Finished Concrete." If both "Form Lining" and "Structural Forms" are included in the same work, list and locate separately.*

(2) Form Facing Material

(2a) Forms for "Form Finished Concrete" shall be faced with Tempered Presdwood as manufactured by the Masonite Corporation, 111 West Washington Street, Chicago, Illinois, or equivalent wood fibre board meeting fully this manufacturer's established standards of quality, strength, density and non-absorptiveness.

(2b) Boards shall be 4 ft. x 12 ft. in area with square-cut, straight edges and sharp arrises; ⅛ in. or $\frac{3}{16}$ in. for form lining and ¼ in. or $\frac{5}{16}$ in. thick for structural forms as best adapted to the particular type of concrete construction.

(3) Form Designs—Shop Drawings

All forms shall be designed *(under the direct supervision of) (or) (by)* the Masonite Corporation. Shop drawings of form designs shall be submitted in triplicate to the *(architect) (engineer)* for checking and approval.

(4) Application of Tempered Presdwood—General Requirements

(4a) Tempered Presdwood forms shall be so constructed that the smooth face of the board shall always be in contact with the finished or exposed face of the concrete.

(4b) Boards shall be so disposed and of such sizes as to eliminate all unnecessary joints between board areas.

(4c) All joints between boards shall be butted tight. Do not spring or force the boards in place.

(4d) The edges of Tempered Presdwood boards, cut on the job, shall be straight, true and clean to produce a smooth, even edge where butted at joints.

(4e) All butt joints shall be rigidly supported for their full length to prevent movement.

(4f) All curved surfaces shall be formed to accurate radial lines.

(4g) Tempered Presdwood may be reused as many times as will provide a continuous, smooth surface.

(4h) Tempered Presdwood forms shall not be brushed, dipped or otherwise treated with "form oils" to facilitate stripping.

(5) Wood Accessories

Wood accessories, such as reverse crown moulds, panel moulds, chamfers, etc. shall be accurately and smoothly milled to produce smooth finished concrete surfaces. They shall be so secured in conjunction with the Tempered Presdwood form facing as to form unbroken lines with all joints, miters, etc. accurately and closely fitted. Wood accessories shall be well oiled with a good grade of form oil before use and shall be maintained in a fairly waterproof condition throughout the work.

(6) Form Lumber

Form lumber used in conjunction with Tempered Presdwood form facing shall be sound material of sufficient size and so spaced as to adequately support the loads to be carried without deflection.

(7) Stripping

Care shall be exercised in stripping the forms from the finished concrete that the Tempered Presdwood edges and face surfaces are not injured in any way to preclude their reuse.

(8) Cleaning and Care of Tempered Presdwood

(8a) Tempered Presdwood forms when stripped from the concrete shall be set face up until dry.

(8b) Brush the face clean with a fibre scrubbing brush and wipe the surface with waste dipped in form or similar oil. Do not use an excess of oil.

(8c) Tempered Presdwood boards when finally removed from forms at completion shall be carefully stacked face up for subsequent reuse. When dry clean the faces. Adequately protect the edges from injury or abuse. All nails shall be carefully backed out and removed before stacking. Tie wire, tie bolt or other holes which will deleterously affect reuse, shall be patched and filled level with Rutland patching plaster sanded smooth.

(9) Inspection of Forms

Immediately before placing concrete the forms shall be carefully inspected to make sure that they are properly braced, sufficiently rigid and thoroughly cleaned of any foreign matter in contact with or adhering to the Tempered Presdwood form face.

(10) Concrete Consistency

Wherever "Form Finished Concrete" is specified, provide an exceedingly plastic concrete to insure smooth finished surfaces free from honey-comb or similar defects.

Note: *Concrete should not be over sanded to produce plasticity since the tight Presdwood forms will produce surface dusting.*

(11) Placing Concrete

(11a) All concrete placed in Tempered Presdwood forms should be well spaded at form sides to assure full and uniform contact with the form face.

(11b) Thoroughly rod or agitate the concrete in closely confined form areas.

(11c) Mass concrete shall be thoroughly puddled.

SPECIFIC APPLICATIONS

(12) Tempered Presdwood Form Lining

(12a) Presdwood Thickness—Forms for all "Form Finished Concrete" surfaces, so specified in paragraph (2), shall be lined with *(⅛ in.) (⅜ in.)* Tempered Presdwood boards.

Note: *Use ⅛ in. thick Tempered Presdwood as form lining on reinforced concrete members of buildings, foundation walls, concrete slab floors, swimming pools, etc.*
Use ⅜ in. thick Tempered Presdwood as form lining for abutments, steel fireproofing, piers, dams, foundations, heavy walls and other mass concrete.

(12b) Application—Boards shall be secured with 3d shingle nails to a solid wood backing, constructed, where possible, for stripping in panel sections. First nail the boards in the center and from that point toward the edges, spacing nails from 12 to 18 inches on centers. Do not clinch nails.

(13) Tempered Presdwood Structural Forms (Arch and Joist Floor Construction)

Note: *For details of form construction, see page 8.*

(13a) Presdwood Thickness—Where "Form Finished Concrete" surfaces are specified in paragraph (2) beneath Arch and Joist Floor Construction, forms for slab soffits, joists and girders shall be constructed of *(¼ in.) (⅜ in.)* thick Tempered Presdwood reinforced with and supported on wood form lumber.

Note: *The thickness of Tempered Presdwood used structurally should be determined by the particular design of the forms and the economical unsupported spans in relation to the loads. For engineering data, see pages 10 and 11.*

(13b) General Form Design—Forms shall be so designed and constructed that slab soffit forms may be dropped or stripped without disturbing the joist and girder side forms—likewise, joist and girder side forms may be stripped without disturbing soffit forms or requiring re-shoring beneath the joist or girder.

(13c) Slab Soffit Forms—Slab Soffits shall be formed by laying loose 1x4 in. or 1x6 in. boards over supporting joists on close enough centers to insure against limits of deflection. Loose stock may be staggered to save time and waste of cutting. Nail loose stock to joists at each end only.

Tempered Presdwood boards shall be laid over loose stock, butted tight together and to joist and girder sides. Nail Tempered Presdwood boards at each side and through the middle the length of the board and across each end approximately 6 in. on centers.

Supporting joists shall be carried on ribbands, nailed to beam and joist sides as detailed.

(13d) Construction of Beam and Joist Sides—The skeleton frame for beam and joist sides shall be constructed of 1x4 in. or 1x6 in. square lumber framed to vertical 1x4 in. beams horizontally as detailed. Over this frame Tempered Presdwood shall be applied in standard lengths (12 ft.) as far as is possible. Edges of Tempered Presdwood boards shall be flush with edges of top and bottom of frame.

1x4 in. ribbands shall be nailed to the vertical battens as detailed to carry soffit joist.

(13e) Beam and Joist Bottoms—Beam and joist bottoms are formed as in regular construction, with a 2-in. lumber center board the width of the beam or joist bottom. This centering board may be lined with a strip of Presdwood after beam and joist have been entirely framed.

(13f) Type of Nails—A ¾-in. brad shall be used to attach Tempered Presdwood to the structural frame.

A 3 penny shingle nail shall be used to attach Tempered Presdwood to loose 1-in. stock.

A 5 penny, double headed nail shall be used to attach all ribbands.

(14) Tempered Presdwood Structural Forms (Arch and Joist with T Beam Floor Construction)

Note: *For details of form construction, see page 9.*

(14a) Presdwood Thickness—Where "Form Finished Concrete" surfaces are specified in paragraph (2) beneath Arch and Joist and T Beam Floor Construction, forms for slab soffits, joists and T Beams shall be constructed of *(¼ in.) (⅜ in.)* thick Tempered Presdwood reinforced with and supported on wood form lumber.

Note: *The thickness of Tempered Presdwood used structurally should be determined by the particular design of the forms and the economical unsupported spans in relation to the loads. For engineering data, see pages 10 and 11.*

(14b) Truss Construction—Concrete joist forms and adjacent T beams shall be carried on wood trusses made up of 1x8 in. boards and 2x3 in. blocking, as detailed, spanning clear through from main beam to main beam, without the use of intermediate shores.

To the truss shall be nailed a 1x2 in. ribband to carry 1x4 in. spreaders.

(14c) Main Beam Construction—The skeleton frame for main beams shall be constructed of 1x4 in. lumber, framed horizontally to 1x4 in. battens, as detailed. To these vertical battens 2x4 in. ribbands shall be nailed and blocked from main beam bottom every sixth batten. These ribbands shall carry wood trusses and the supported load.

To this skeleton frame shall be attached Tempered Presdwood in as large sheets as possible, with edges of board flush with edges of top and bottom of frame.

Main beam bottoms shall be constructed of 2-in. dimension lumber cleated together and sufficiently shored to carry the heavy floor panel loads.

(14d) Concrete Joist Construction—Joist sides shall be constructed of 1x4 in. boards, cleated together, the full depth of the concrete joist. Sides shall be cleated vertically with 1x4 in. boards approximately 36 in. on centers.

Joist bottoms shall be constructed of Tempered Presdwood boards, the width of the concrete joist. They shall rest on the wood trusses.

To joist side and bottom forms shall be attached Tempered Presdwood in as large sheets as possible.

(14e) T Beam Construction—T Beam form sides shall be made up the same as joist side forms and T Beam bottoms shall be framed with 1-in. boards resting on the wood trusses.

To T beam sides and bottom shall be attached Tempered Presdwood in as large sheets as possible.

(14f) Constructing Slab Soffit Forms—On top of 1x4 in. ribbands nailed to joist sides, shall rest loose 1x4 in. boards, spaced on centers sufficient to carry slab load without excessive deflection of Presdwood board.

Over loose 1x4 in. boards shall be placed Tempered Presdwood boards in as large sheets as possible.

Presdwood Board shall be nailed at each edge the length of the board and nailed on alternate 1x4 in. boards between edges.

(14g) Type of Nails—All ribbands shall be attached with 5 penny double headed nails to facilitate stripping.

Presdwood shall be attached to structural frame with ¾-in. brads.

Presdwood boards for slab soffit shall be attached to loose 1x4 in. boards with 3 penny shingle nails.

(15) Tempered Presdwood Structural Forms (Solid Concrete Floor Slab Construction)

Note: *For details of form construction, see page 10.*

(15a) Presdwood Thickness—Where "Form Finished Concrete" surfaces are specified in paragraph (2) beneath Solid Concrete Floor Slab Construction, forms shall be constructed of *(¼ in.) (⅜ in.)* thick Tempered Presdwood reinforced with and supported on wood form lumber.

Note: *The thickness of Tempered Presdwood used structurally should be determined by the particular design of the forms and the economical unsupported spans in relation to the loads. For engineering data, see pages 10 and 11.*

(15b) General Form Design—Forms shall be properly shored, braced and centered so as to insure a rigid support.

(15c) Supporting Timbers—Supporting lumber for Presdwood sub-decking shall be 4x4 in. shoring posts, supporting 2x10 in. girts on end, scabbed to the posts with 2x4 in. cleats on centers as detailed.

Note: *4x6 in. joists shall be spaced on close enough centers to carry slab load within deflection limits.*

(15d) Slab Soffit Framing—Across 4x6 in. joists shall be laid loose 1x6 in. boards with a 6-in. space between boards.

Boards may be staggered to save waste and labor of cutting. Boards shall be nailed to joists only at each end.

Over this 1x6 in. sub-decking shall be laid Tempered Presdwood in Standard sized sheets (4x12 ft.) as far as possible. Presdwood boards shall be butted tight, end to end, and side to side.

Boards shall be nailed down the middle and along each edge the full length of the board and across each end approximately 12 in. on centers.

(15e) Framing Drop Heads—Supporting frame for drop head sub-decking shall be 2x4 in. lumber, built in two interchangeable sections as detailed.

Sub-decking, Tempered Presdwood and nailing shall be the same as for slab soffits.

(16) Tempered Presdwood Structural Forms (Concrete Columns)

Note: *For details of form construction, see page 9.*

(16a) Presdwood Thickness—Where "Form Finished Concrete" surfaces are specified in paragraph (2) for concrete columns, forms shall be constructed of *(¼ in.) (5/16 in.)* thick Tempered Presdwood reinforced with wood form lumber.

Note: *The thickness of Tempered Presdwood used structurally should be determined by the particular design of the forms and the economical unsupported spans in relation to the loads. For engineering data, see pages 10 and 11.*

(16b) Square and Rectangular Column Sides—Tempered Presdwood boards shall be first cut into strips the width desired for each column side. Two sides of the same dimension in each column shall be cut ¾ in. full to allow for overlap of forms at corners.

Beam and girder cutouts shall be made on the Tempered Presdwood board before wood backing is nailed on.

Standard lengths of Tempered Presdwood shall be used where possible and there shall be no horizontal joints the height of the column in columns 12 ft. high or shorter.

Standard widths of Presdwood board (48 in.) shall be used where possible and there shall be no vertical joints in column sides 48 in. wide or less.

1x6 in. boards shall be used as a backing for Tempered Presdwood applied as follows:

1x6 in. boards shall be nailed to the edges of Tempered Presdwood board flush and even. The space in between 1x6 in. board shall be filled in as close as possible with additional 1x6 in. boards.

The 1x6 in. backing at bottom of beam and girder cutouts shall be scabbed.

(16c) Making and Placing Column Bases—Adequate templates shall be made in advance to seat and confine column bases. These templates shall be set to lines and centers furnished by the engineer before columns are erected.

(16d) Column Clamping—Columns shall be clamped on close enough centers to insure against bulging.

(16e) Beveled Corners—Where columns are shown on plans or indicated in specifications to have beveled corners, they shall be formed by nailing a chamfer strip in each corner of the column, its full height.

(16f) Type of Nails—3 penny shingle nails shall be used to attach Presdwood to its backing and all nails shall be clinched.

¾ in. brads shall be used to attach chamfer strips to the corners of the Presdwood Column.

(17) Tempered Presdwood Structural Forms (Massed Concrete for Piers, Abutments, Foundations, Dams, Bridges, Etc.)

Note: *For details of form construction, see page 7.*

(17a) Presdwood Thickness—Where "Form Finished Concrete" surfaces are specified in paragraph (2) for Mass Concrete, forms shall be constructed of *(¼ in.) (5/16 in.)* thick Tempered Presdwood reinforced with wood form lumber.

Note: *The thickness of Tempered Presdwood used structurally should be determined by the particular design of the forms and the economical unsupported spans in relation to the loads. For engineering data, see pages 10 and 11.*

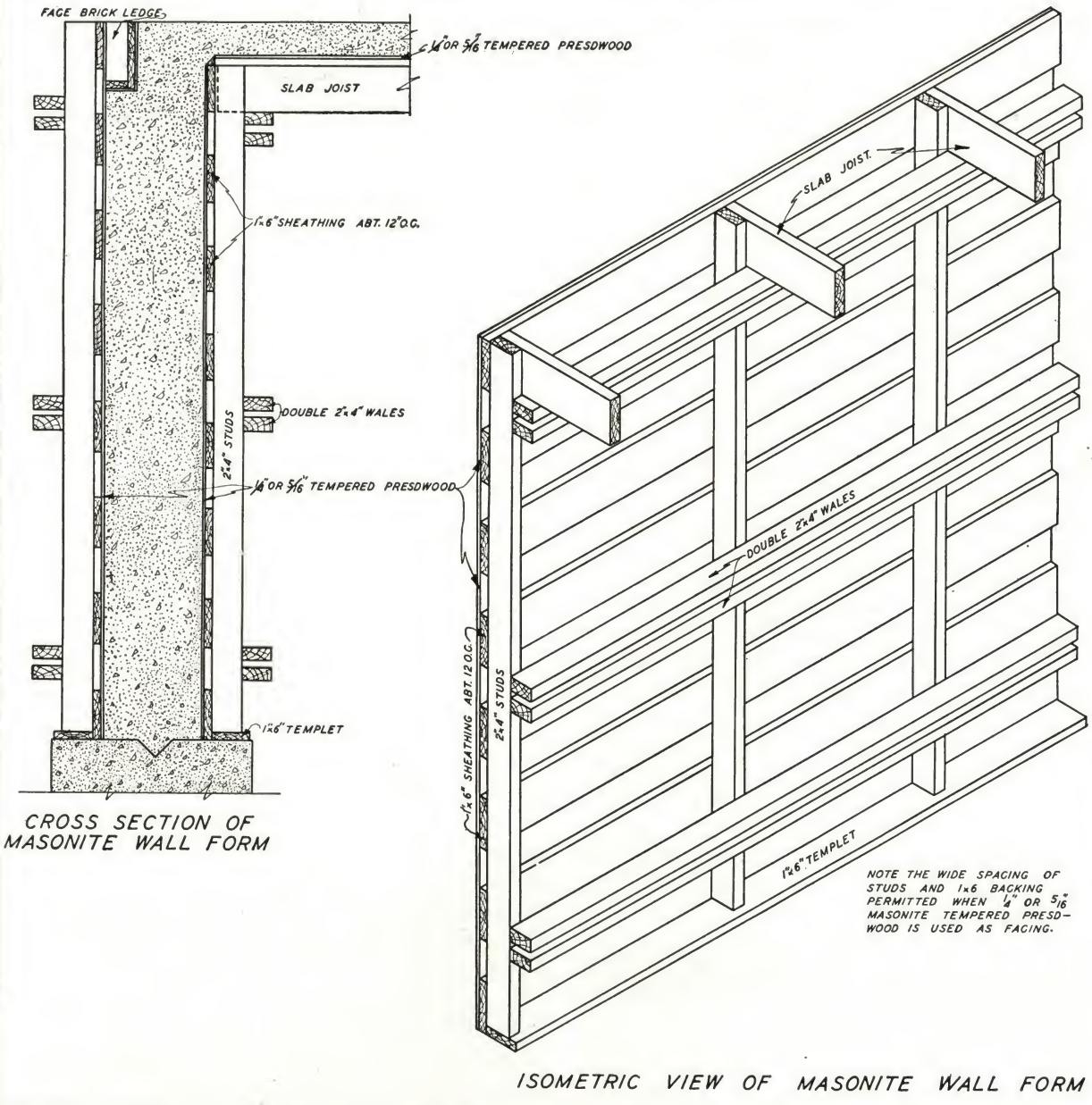
(17b) General Form Design—Studs and open wood sheathing shall be placed upon close enough centers to insure against excessive deflection.

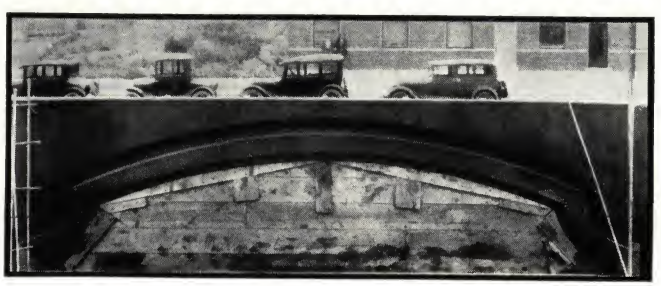
(17c) Standard Size Presdwood Boards—To insure a minimum number of joints, standard size (4x12 ft.) Tempered Presdwood boards shall be used where possible.

(17d) Nailing—Tempered Presdwood shall be nailed to studs and sheathing with 3 penny shingle nails approximately 12 in. on centers.

North East Y. M. C. A. Buildings, Detroit, Mich.; Smith, Hinchman and Grylls, Detroit, Architects; A. A. Albrecht Co., Detroit, General Contractors. The illustration at the left shows the Masonite Tempered Presdwood forms in position ready for the pouring of concrete. That at the right shows a "Form Finished" concrete ceiling ready for decorating.

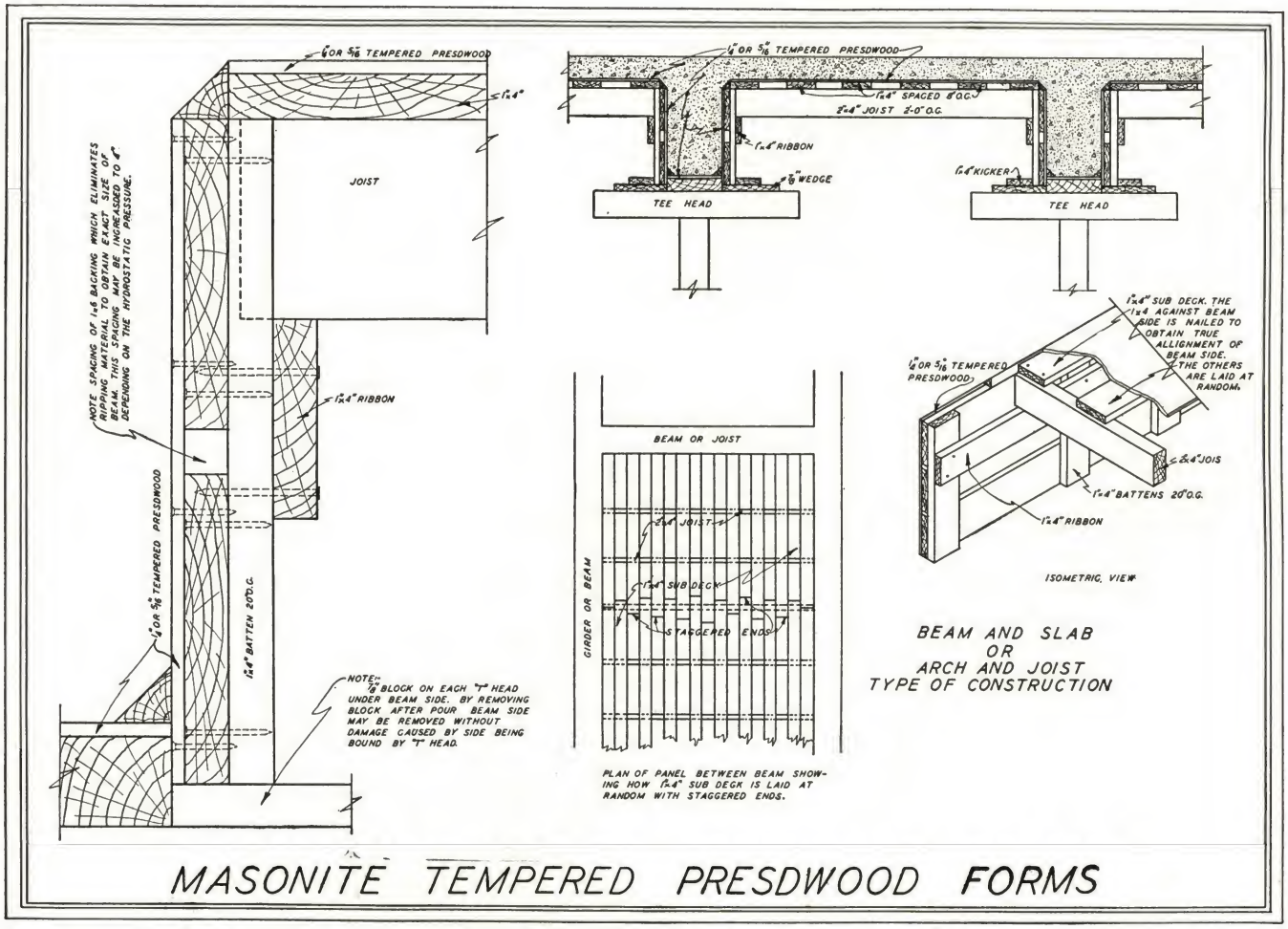
WALL FORMS FOR MASS CONCRETE





At left, exterior wall forms lined with Tempered Presdwood for "Form Finished" concrete requiring no tooling or rubbing after form stripping. At the right, enlargement of Presdwood forms cut with a minimum of labor to fit facade arches.

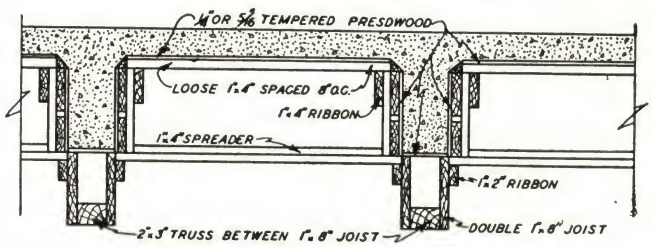
BEAM AND SLAB OR ARCH AND JOIST CONSTRUCTION



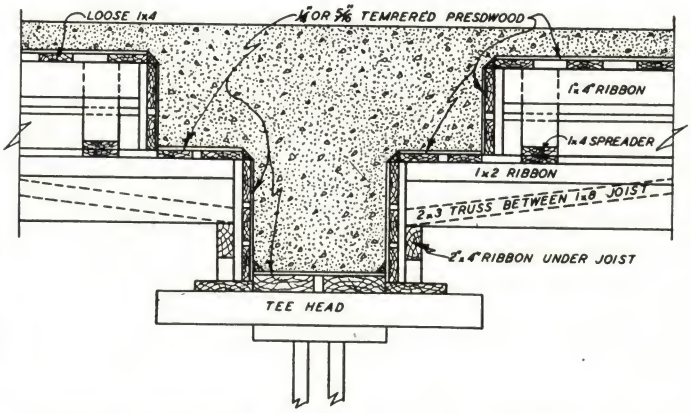
MASONITE TEMPERED PRESDWOOD FORMS

Marine Barracks, U. S. Government Reserve, Quantico, Va.; Bureau of Yards and Docks, Navy Dept., Washington, D. C., Architect; Ralph Sollitt and Sons, Chicago, Contractors. 780,000 square feet of "Form Finished" concrete surfaces, both exterior and interior. Note the loose lumber forms with ends staggered ready to receive the Presdwood form boards.

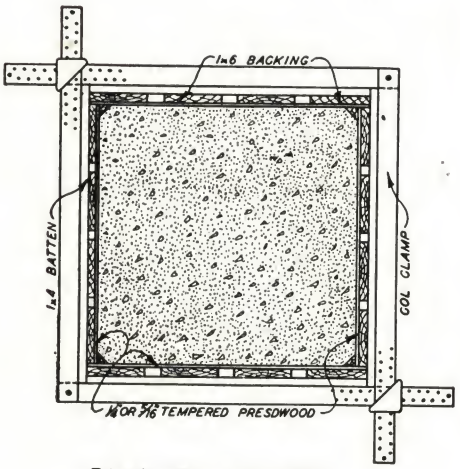
ARCH AND JOIST AND T BEAM CONSTRUCTION



CROSS SECTION OF MASONITE TEMPERED PRESDWOOD PAN USED WITH "T" BEAM CONSTRUCTION



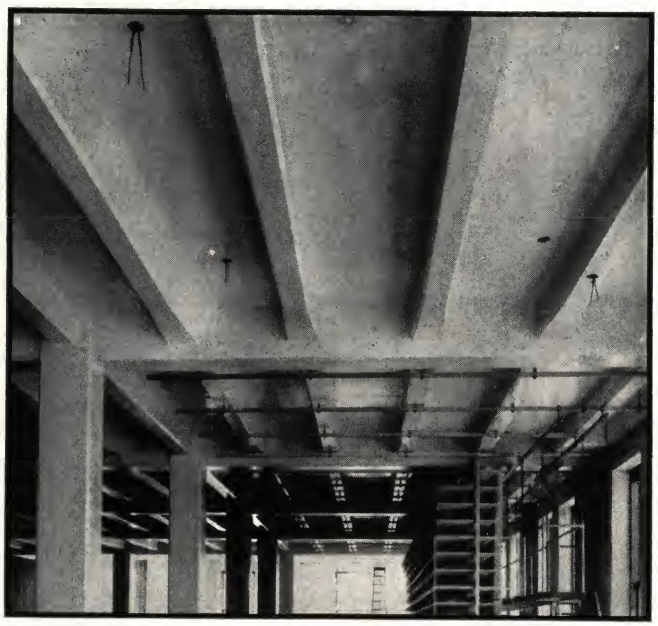
CROSS SECTION OF "T" BEAM SHOWING ARCH RIB FORMING INTO "T" BEAM



PLAN OF COLUMN

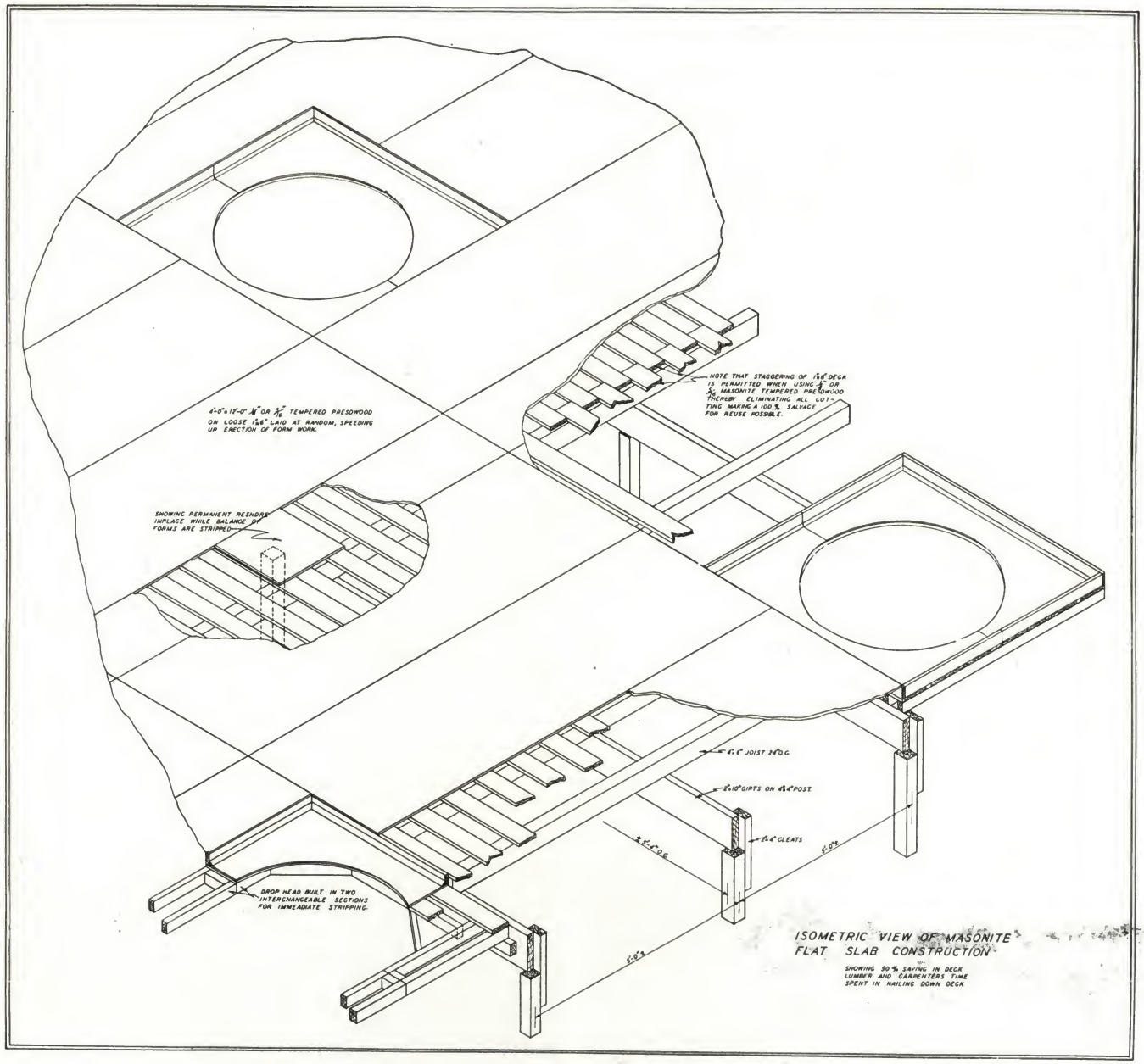
NOTE HOW SPACING OF 1x6 BACKING ELIMINATES ALL RIPPING TO OBTAIN EXACT COL SIZE.

State Insane Asylum, Dunning, Ill.; C. Herrick Hammond, State Architect; J. B. French Co., Chicago, Contractors. Tempered Presdwood forms are here shown ready for concrete.



Dayton Bell Telephone Building, Dayton, Ohio, Schenck and Williams, Architects; R. H. Blagg, Contractor. Tempered Presdwood forms were used for columns, beams and slabs.

FLAT SLAB CONSTRUCTION



TYPICAL EXAMPLE FOR THE USE OF DEFLECTION CHARTS

(See charts on opposite page 11)

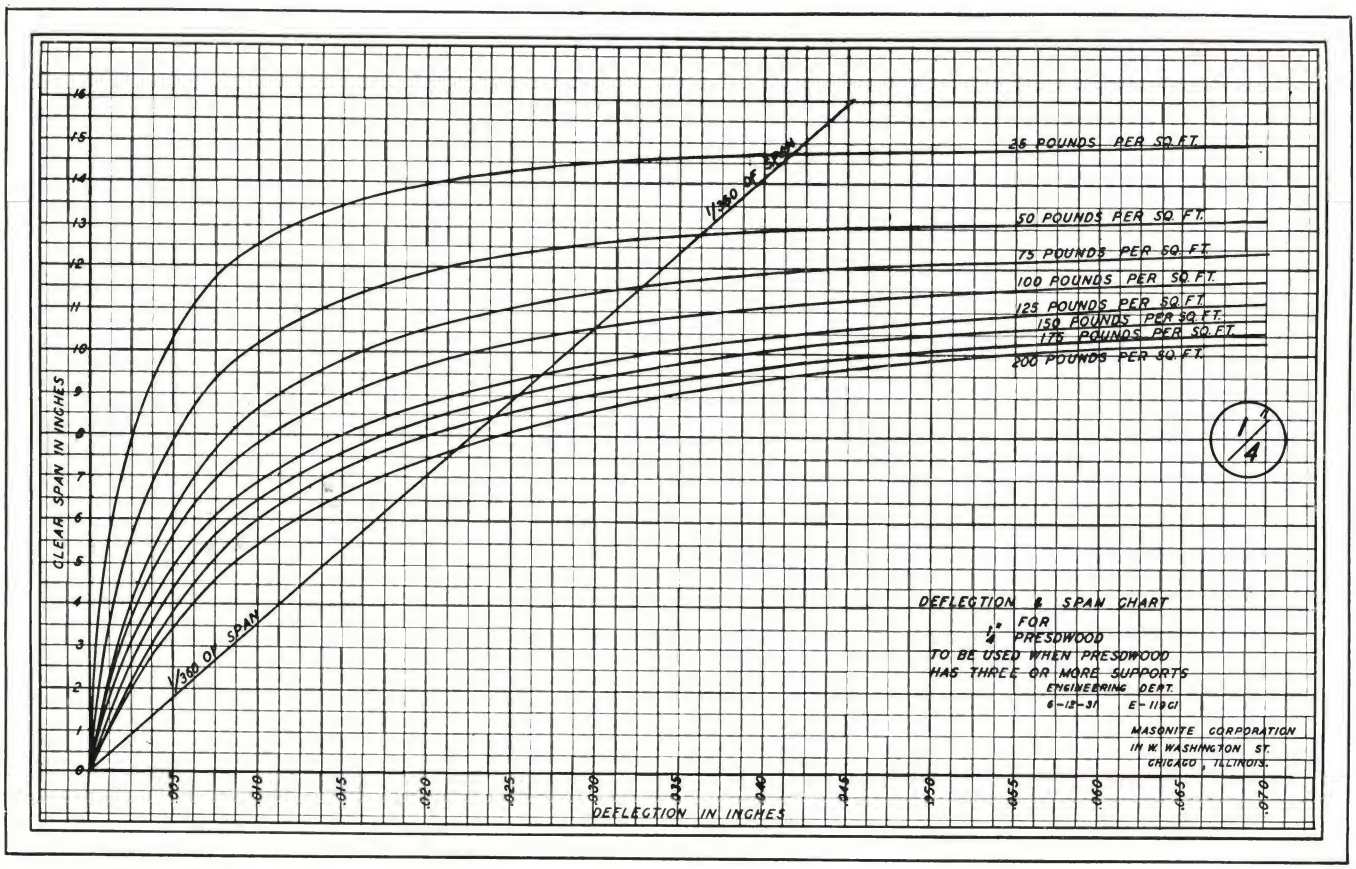
The Contractor has a solid 8-in. concrete slab floor to form. He wishes to know how far apart he can space his 2x8's to get within the allowable limits of deflection. Usually the allowable deflection limit for floors is 1/360th of the span. An 8-in. concrete slab floor will weigh 100 pounds per square foot of floor. Add to this a working stress of 25 pounds per square foot, making a total of 125 pound load that the Presdwood board must support, within the deflection limits.

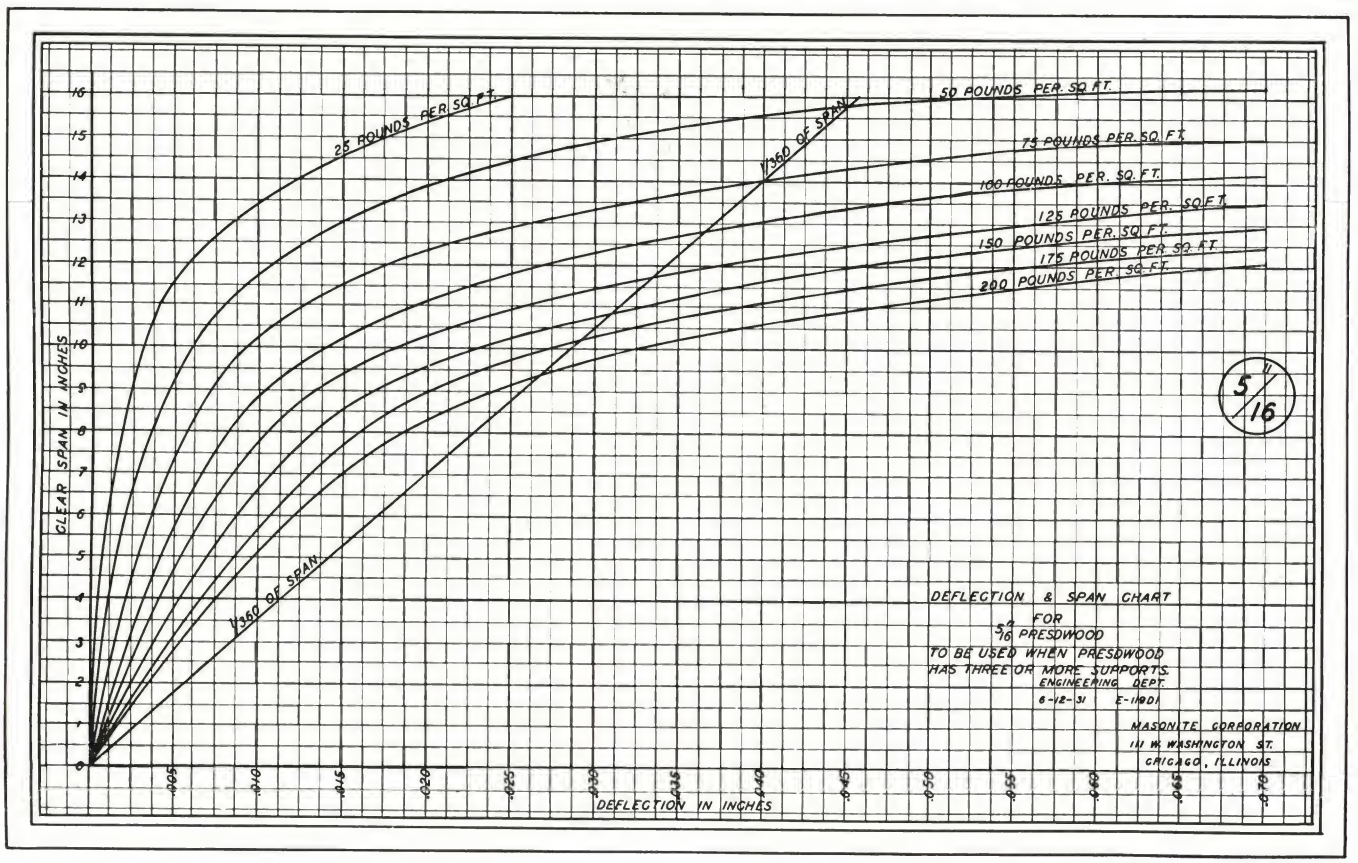
Turning to the stress diagram for ¼-in. Presdwood, take for trial joists 10 inches on centers. The span between supporting joists is 8 in. 1/360th of 8 in. gives a deflection of .022.

On the deflection scale count off four squares to .020 and follow this vertical line up to the horizontal line intersecting the point 8 in. on the clear span scale at the left of the diagram. The first curve we intersect is 175 pounds per square foot, so we are well within our limits.

Let us try a span of 9 in. 1/360th of a span of 9 in. is .025. Follow the line on .025 of the deflection scale vertically to the horizontal line intersecting the point 9 in. on the span scale. We find we are under the curve load to be supported of 125 pounds per square foot. It is, therefore, perfectly safe to span the joists 11 inches on centers (clear span 9 in.).

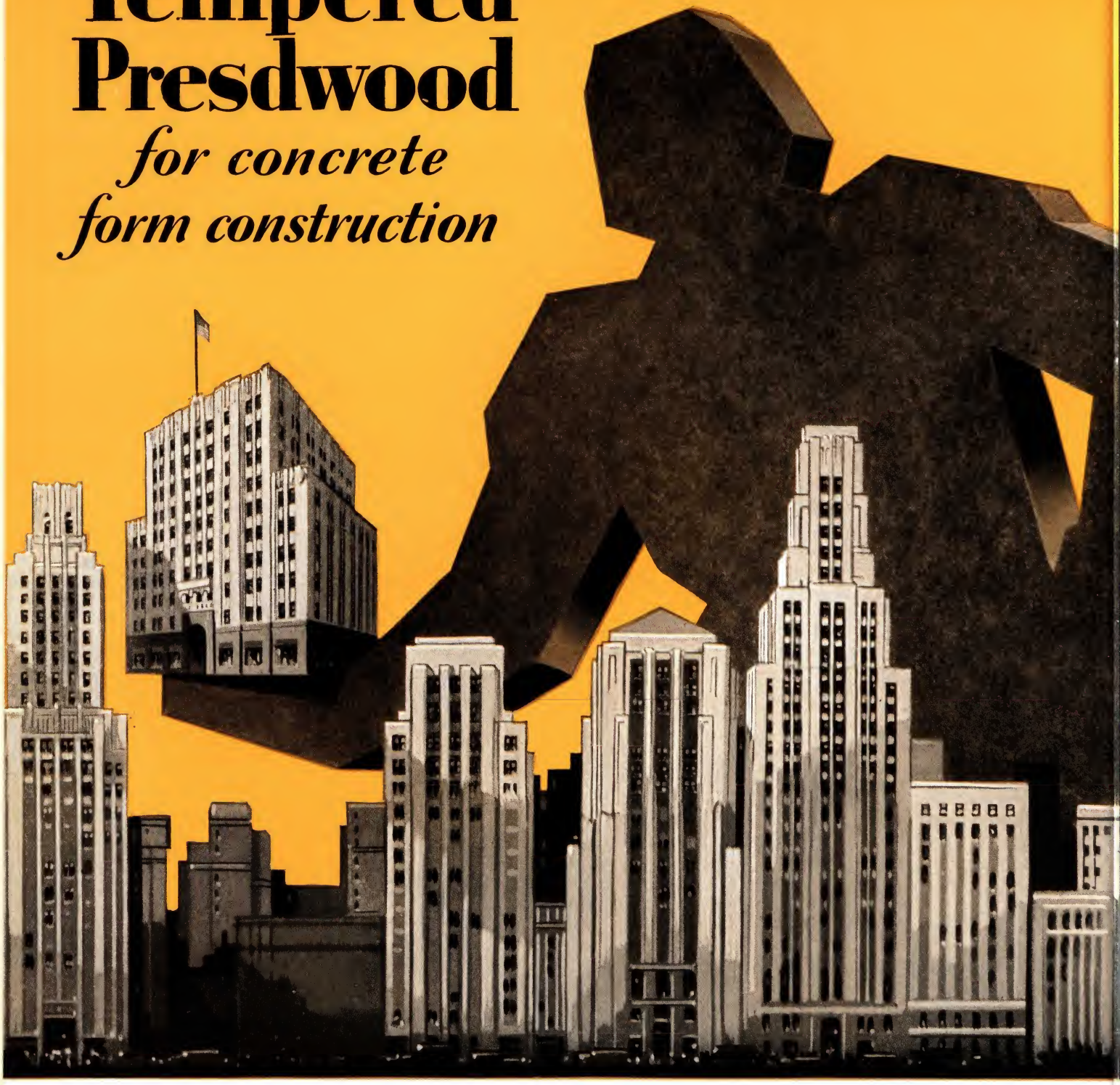
DEFLECTION CHARTS FOR 1/4" AND 5/16" PRESDWOOD





Masonite Tempered Presdwood

for concrete form construction



Masonite Corporation

111 W. Washington Street, Chicago, Ill.

AMERICAN STEEL & WIRE COMPANY

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

Triangle Mesh and Electrically Welded Wire Fabric for Concrete Reinforcement

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DALLAS, Praetorian Building
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Products

TRIANGLE MESH and ELECTRICALLY WELDED WIRE FABRICS for CONCRETE REINFORCEMENT.

For our catalogues on Triangle Mesh for Stucco Base, Wire Rope, Electrical Wires and Cables, see Manufacturers' Index.

Uses

Triangle Mesh and Electrically Welded Wire Fabrics are used for the reinforcing of concrete floor and roof slabs, concrete walls and chimneys, arch construction, beams, columns, dams and retaining walls, water, sewer and culvert pipe, pavements and roadways, river revetment, silos, fireproofing steel framing, bridge floors, reservoirs, monolithic concrete sewers and stucco work.

Advantages of Wire Fabric Reinforcement

(1) Provides even distribution of steel.
(2) Reinforces in every direction.
(3) Tension or carrying members accurately spaced.
(4) Low cost of inspection.
(5) Properly distributes over a large area stresses due to concentrated load.
(6) Due to cold drawing, higher elastic limits and ultimate strengths with same quality of steel.
(7) Continuous action from one end of the structure to the other.
(8) Impossible to leave out or otherwise reduce the necessary steel if specific style number of fabric or area of steel is specified.
(9) Perfect mechanical bond.
(10) Easily handled and stored on the work.
(11) Minimum cost of installation.

Grade of Steel

A reduction of the required sectional area of steel is safely accomplished, within limits, by the use of a higher tensile strength steel. This high tensile strength may be secured by increasing the carbon content or by cold drawing of mild steel.

Cold drawing of mild steel produces a high ultimate strength and yield point, and the proportion of the yield point to the ultimate strength is increased to from 70 to 90%. Since the strength of a reinforced concrete structure, in so far as the reinforcement is concerned, depends on the yield point of the steel, the high yield point of cold drawn wire is of great importance. A working stress of 25,000 lb. per sq. in. is recommended where permitted by building codes.

Galvanizing

Triangle Mesh Reinforcement is furnished plain on orders unless otherwise specified.

American Electrically Welded Fabric is furnished plain or galvanized as ordered.

In general, the additional cost for galvanized fabric is not justified except in special cases where the steel will be inadequately protected, as in very thin slabs, etc.

Triangle Mesh Woven Wire Concrete Reinforcement

Triangle Mesh Fabric is made from cold drawn mild steel having an ultimate strength of 70,000 to 85,000 lb. per sq. in. The longitudinal members are spaced 4 in., the diagonal cross wires either 2, 4, or 8 in. It is the only design of wire fabric having cross wires that assist the longitudinals in carrying the load.

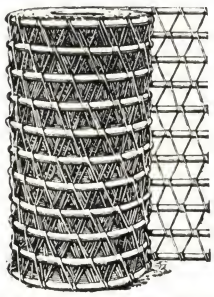


Fig. 1. Triangle Mesh Wire Fabric Reinforcement

For the light styles of fabric, the longitudinals consist of 1 wire; for the medium styles, 2 wires laid parallel; and for the heavy styles, 3 wires stranded. The sizes of the wires and the number per longitudinal are varied to obtain the desired cross-sectional area of steel per foot of width. Stranded longitudinals are used to reduce the stiffness of the finished product without affecting the tensile strength.

TRIANGLE MESH WOVEN WIRE CONCRETE REINFORCEMENT

Style No.	Number and gauge of wires each, longitudinal, A. S. & W. Co.'s steel wire gauge	Sectional area longitudinals, sq. in. per ft. width	Effective sect. areas, sq. in. per ft. of fabric		Approx. weight, lb. per 100 sq. ft.
			Trans.	Longit.	
Longitudinals Spaced 4 in. Cross Wires No. 14 Gauge, Spaced 4 in.					
032	1—No. 12 gauge	.026	.022	.032	22
040	1—No. 11 gauge	.034	.022	.040	25
049	1—No. 10 gauge	.043	.022	.049	28
058	1—No. 9 gauge	.052	.022	.058	32
068	1—No. 8 gauge	.062	.022	.068	35
080	1—No. 7 gauge	.074	.022	.080	40
093	1—No. 6 gauge	.087	.022	.093	45
107	1—No. 5 gauge	.101	.022	.107	50
126	1—No. 4 gauge	.120	.022	.126	57
146	1—No. 3 gauge	.140	.022	.146	65
153	1—¼ in.	.147	.022	.153	68
168	1—No. 2 gauge	.162	.022	.168	74
180	2—No. 6 gauge	.174	.022	.180	78
208	2—No. 5 gauge	.202	.022	.208	89
245	2—No. 4 gauge	.239	.022	.245	103
267	3—No. 6 gauge	.261	.022	.267	111
287	3—No. 5½ gauge	.281	.022	.287	119
309	3—No. 5 gauge	.303	.022	.309	128
336	3—No. 4½ gauge	.330	.022	.336	138
365	3—No. 4 gauge	.359	.022	.365	149
395	3—No. 3½ gauge	.389	.022	.395	160
Longitudinals Spaced 4 in. Cross Wires No. 14 Gauge, Spaced 8 in.					
036P	1—No. 12 gauge	.026	.009	.036	17
044P	1—No. 11 gauge	.034	.009	.044	20
053P	1—No. 10 gauge	.043	.009	.053	24
062P	1—No. 9 gauge	.052	.009	.062	27
072P	1—No. 8 gauge	.062	.009	.072	31
084P	1—No. 7 gauge	.074	.009	.084	35
097P	1—No. 6 gauge	.087	.009	.097	40
Longitudinals Spaced 4 in. Cross Wires No. 12½ Gauge, Spaced 8 in.					
041R	1—No. 12 gauge	.026	.014	.041	21
049R	1—No. 11 gauge	.034	.014	.049	24
058R	1—No. 10 gauge	.043	.014	.058	28
067R	1—No. 9 gauge	.052	.014	.067	31
077R	1—No. 8 gauge	.062	.014	.077	35
089R	1—No. 7 gauge	.074	.014	.089	40
102R	1—No. 6 gauge	.087	.014	.102	44

Longitudinals Spaced 4 in. Cross Wires Nos. 14 and 12½ Gauge, Spaced 2 in.

(This material is used principally for cement gun work)

Style No.	Number of wires each, longitudinal	Gauge of wires each, longitudinal	Gauge of cross wires	Approx. weight, lb. per 100 sq. ft.
7A	1	**12**	**14**	31
6A	1	**10**	**14**	37
5A	1	**8**	**14**	44
4A	1	**6**	**14**	53
29A	1	**12**	**12½**	42
28A	1	**10**	**12½**	48
27A	1	**8**	**12½**	55
26A	1	**6**	**12½**	64

Rolls: Standard lengths 150, 200 and 300 ft.
Widths: Approximately 16, 20, 24, 28, 32, 36, 40, 44, 48, 52 and 56 in.
Finish: Plain or galvanized.
Tensile strength: Standard, 70,000 to 85,000 lb. per sq. in.

Electrically Welded Wire Fabric Reinforcement

A square or rectangular mesh made from cold drawn steel wire electrically welded at the intersections of the transverse and longitudinal wires. Various combinations of spacings and sizes of wires can be furnished.

This material combines the same high quality of material and service that has given Triangle Mesh reinforcement its enviable reputation.

When embedded in concrete, this mesh yields the maximum of its steel strength.

AMERICAN ELECTRICALLY WELDED FABRIC

Spacing of wires, in.		Gauge number		Sect. area, sq. in. per ft.		Weight per 100 sq. ft., lb.
Longit.	Trans.	Longit.	Trans.	Longit.	Trans.	
2	16	1	7	.377	.018	140
2	16	2	8	.325	.015	119
2	16	3	8	.280	.015	104
2	16	4	9	.239	.013	89
2	16	5	10	.202	.011	75
2	16	6	10	.174	.011	65
2	16	7	11	.148	.009	55
3	16	1	7	.252	.018	96
3	16	2	8	.216	.015	83
3	16	3	8	.187	.015	72
3	16	4	9	.159	.013	61
3	16	5	10	.135	.011	52
3	16	6	10	.116	.011	45
3	16	7	11	.098	.009	38
3	16	8	12	.082	.007	32
4	16	3	8	.140	.015	56
4	16	4	9	.120	.013	48
4	16	5	10	.101	.011	40
4	16	6	10	.087	.011	35
4	16	7	11	.074	.009	30
4	12	8	12	.062	.009	26
4	12	9	12	.052	.009	22
4	12	10	12	.043	.009	19
4	12	12	12	.026	.009	13
4	12	5	5	.101	.034	48
4	12	6	6	.087	.029	42
4	12	7	7	.074	.025	35
4	12	8	8	.062	.021	30
6	12	0	6	.148	.029	65
6	12	2	2	.108	.054	59
6	12	3	3	.093	.047	51
6	12	4	4	.080	.040	44
6	12	5	5	.067	.034	37
6	12	6	6	.058	.029	32
6	12	7	7	.049	.025	27
6	8	12	12	.017	.013	11
6	6	0	0	.148	.148	107
6	6	1	1	.126	.126	91
6	6	2	2	.108	.108	78
6	6	3	3	.093	.093	68
6	6	4	4	.080	.080	58
6	5	5	5	.067	.067	49
6	6	6	6	.058	.058	42
6	6	7	7	.049	.049	36
6	6	8	8	.041	.041	30
6	6	9	9	.035	.035	25
6	6	10	10	.029	.029	21
6	6	12	12	.017	.017	13
4	4	4	4	.120	.120	85
4	4	6	6	.087	.087	62
4	4	8	8	.062	.062	44
4	4	10	10	.043	.043	31
4	4	12	12	.026	.026	19
4	4	14	14	.015	.015	11
3	3	10	10	.057	.057	41
3	3	12	12	.035	.035	25
2	2	10	10	.086	.086	60
2	2	12	12	.052	.052	37
2	2	14	14	.030	.030	21
2	4	12	12	.052	.026	28
2	4	14	14	.030	.015	16

Other styles can be furnished on application.
Rolls: Standard lengths 150, 200 and 300 ft. For No. 2 gauge wires and larger, flat sheets only.
Widths: Multiples of the spacing of longitudinal wires up to a maximum width which varies with the size and spacing of the longitudinals. Approximate maximums 56 to 72 in. for 2-in. spacing, 84 to 96 in. for 3 or 4-in. spacing, and 96 to 120 in. for 6-in. spacing.
Finish: Plain or galvanized.
Tensile Strength: Standard, 60,000 to 70,000 lb. per sq. in.; 70,000 to 80,000 lb. furnished when ordered.
Weights—All above weights are based on a width of 60 in. measured from center to center of the outside or selvage longitudinal wires.

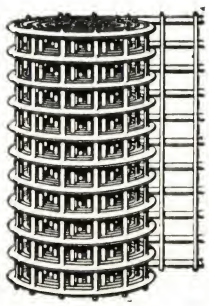


Fig. 2. Electrically Welded Wire Fabric Reinforcement

AREA OF STEEL AND THICKNESS OF SLAB REQUIRED FOR GIVEN SPANS AND LOADS

Bending moment=$WL^2 \div 12$. Center of steel ¾ in. above bottom of slab.

Reinforcement in each case is sufficient for the live load shown plus the weight of the concrete slab. Any dead load of the floor exclusive of the concrete slab should be considered as part of the live load shown here.

Working stresses: Steel = 18,000 lb., Concrete = 700 lb.

Note: If not restricted by building code to a stress in the steel of 18,000 lb., a stress of 20,000 lb. can safely be used for wire mesh reinforcement. For a steel stress of 20,000 lb. reduce the areas of steel shown in the table by 10%. We recommend a 25,000-lb. per sq. in. working stress as economical and safe construction.

After hundreds of tests of actual slabs made by the Testing Laboratory of Columbia University, the City of New York prepared a code covering slabs having spans of 8 ft. or less and decided on the use of an empirical formula that is equivalent to assuming a working stress in the steel in the standard formula for reinforced concrete design of approximately 32,000 lb. per sq. in. Millions of square feet of reinforced concrete floors have been built in accordance with this New York code. See second page following for complete tables New York Code.

Live load per sq. ft. lb.	Span of slab, center to center of supports, ft.-in.																					
	4-0	4-6	5-0	5-6	6-0	6-6	7-0	7-6	8-0	8-6	9-0	9-6	10-0	10-6	11-0	11-6	12-0	12-6	13-0	13-6	14-0	14-6
	Floor slab thickness and area of steel in sq. in. per foot width of slab required for spans and loads indicated																					
30	3″ .027	3″ .035	3″ .043	3″ .053	3″ .064	3″ .075	3″ .086	3″ .100	3″ .116	3″ .132	3″ .148	3″ .166	3½″ .163	3½″ .180	3½″ .198	3½″ .218	4″ .216	4″ .235	4″ .255	4½″ .255	4½″ .276	4½″ .297
40	3″ .032	3″ .040	3″ .050	3″ .061	3″ .074	3″ .087	3″ .101	3″ .117	3″ .135	3″ .153	3″ .172	3½″ .168	3½″ .187	3½″ .206	4″ .205	4″ .224	4″ .245	4½″ .245	4½″ .266	4½″ .288	5″ .289	5″ .311
50	4″ .028	4″ .035	4″ .044	4″ .054	4″ .064	4″ .076	4″ .089	4″ .102	4″ .117	4″ .133	4″ .150	4″ .168	4″ .187	4″ .208	4″ .229	4″ .251	4½″ .250	4½″ .273	4½″ .295	5″ .296	5″ .320	5″ .343
60	4″ .030	4″ .039	4″ .049	4″ .059	4″ .071	4″ .083	4″ .098	4″ .113	4″ .130	4″ .148	4″ .166	4″ .186	4″ .207	4″ .229	4″ .253	4½″ .251	4½″ .275	4½″ .300	5″ .299	5″ .324	5½″ .326	5½″ .351
80	4″ .037	4″ .047	4″ .059	4″ .071	4″ .085	4″ .100	4″ .117	4″ .135	4″ .155	4″ .176	4″ .198	4″ .223	4″ .248	4½″ .246	4½″ .272	4½″ .298	5″ .297	5″ .324	5½″ .325	5½″ .353	5½″ .380	6″ .382
100	4″ .042	4″ .054	4″ .068	4″ .083	4″ .099	4″ .117	4″ .137	4″ .158	4″ .180	4″ .205	4″ .231	4″ .259	4½″ .257	4½″ .285	5″ .285	5″ .313	5″ .343	5½″ .342	5½″ .369	6″ .373	6″ .405	
125	4″ .050	4″ .064	4″ .080	4″ .097	4″ .116	4″ .137	4″ .160	4″ .185	4″ .213	4″ .242	4½″ .241	4½″ .270	4½″ .302	5″ .301	5″ .333	5½″ .333	5½″ .365	6″ .365	6″ .399			
150	4″ .058	4″ .073	4″ .092	4″ .112	4″ .135	4″ .159	4″ .185	4″ .214	4″ .245	4½″ .246	4½″ .277	5″ .278	5″ .310	5″ .344	5½″ .345	5½″ .379	6″ .382	6″ .417				
175	4″ .066	4″ .083	4″ .104	4″ .127	4″ .152	4″ .180	4″ .210	4″ .243	4½″ .244	4½″ .278	5″ .280	5″ .314	5½″ .317	5½″ .352	6″ .356	6″ .391						
200	4″ .073	4″ .093	4″ .116	4″ .141	4″ .170	4″ .200	4″ .234	4½″ .237	4½″ .272	5″ .276	5″ .312	5½″ .316	5½″ .352	6″ .357	6″ .394							
250	4″ .088	4″ .112	4″ .140	4″ .172	4″ .205	4″ .243	4½″ .245	4½″ .288	5″ .292	5″ .333	5½″ .338	5½″ .379	6″ .386									
300	4″ .103	4″ .132	4″ .165	4″ .202	4″ .242	4½″ .249	4½″ .292	5″ .299	5″ .343	5½″ .350	6″ .359	6″ 403										

See tables on preceding page for styles of Triangle Mesh and American Electrically Welded Fabric that will give required areas.

Wire Fabric Reinforced Slabs

Supporting the Mesh Reinforcement—The correct location of the reinforcing mesh in the top portion of slabs over concrete beams can be easily and cheaply obtained by means of precast concrete blocks as shown in Fig. 3.

Fig. 3. Inexpensive Method of Supporting Wire Mesh Reinforcement Over Concrete Beams

Blocks should have a height about 1¼ or 1½ in. less than the full thickness of the slab. The length may be any convenient amount such as 1 or 2 ft. or such lengths as are readily formed by breaking long strips of the blocks. The mesh should be supported for at least one-third of its width. These blocks will stay in approximately correct position without any means of attachment to the reinforcing mesh or to the forms.

For short spans (about 8 ft. or less) these blocks will be required on one side only of the beams. For spans greater than 8 ft., use blocks on both sides.

Detailing Widths of Mesh—For estimating purposes where accuracy is unnecessary, provided the estimate is on the safe side, it is permissible to assume that the mesh required will equal in square feet the actual area of the floor slab. As a matter of fact, the amount of mesh needed will be less than that, and at the same time a more efficient and more economical layout is possible. In the first place, a 2-in. lap along the sides of the sheets of wire mesh reinforcement is sufficient to develop the full strength of the reinforcement; more

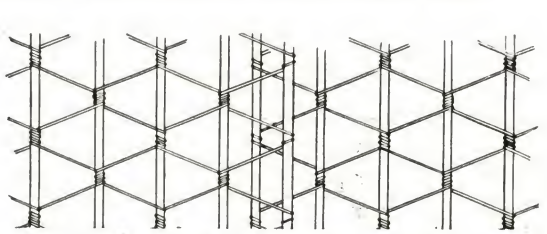


Fig. 4. Triangle Mesh Reinforcement As It Actually Appears with a Side Lap of 2 in.

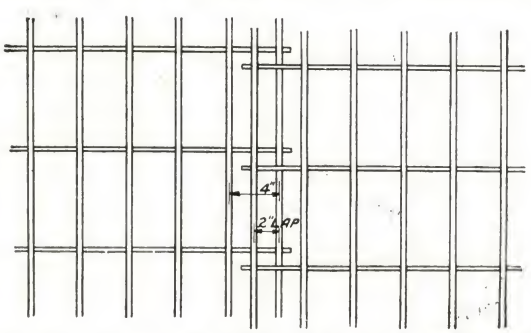


Fig. 5. Electrically Welded Fabric As It Actually Appears with a Side Lap of 2 in.

than that is a waste of material. This 2-in. lap means a lap of the outside (or selvage) longitudinal wires and should not be assumed for those forms of mesh having a zigzag selvage edge.

A suggested detail for the amount and location of wire mesh reinforcement is shown in Fig. 6. Providing a short strip of light weight fabric is placed near the top of the slab over the girders with the main longitudinal wires at right angles to the direction of the girders, it is not only unnecessary but a waste of material to require that the main reinforcement of the slabs entirely cover the space between and over the girders. The distance between the center line of the girder and the edge of the reinforcing fabric can be any amount up to about 20 in. without reducing the strength of the structure.

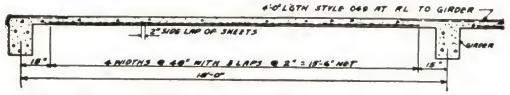


Fig. 6. Detailing Widths of Mesh and Showing Extra Strip of Mesh Over the Girders

Other Uses of Wire Mesh Reinforcement

Concrete Joist Floors—Fig. 7 shows a typical section of such a floor. Here is a 2 or 3-in. slab having a clear span between the supporting ribs of 20 in., that must not only act as part of the compression portion of the beams and resist temperature stresses, but in addition act as a support of the loads that may come upon the floor.

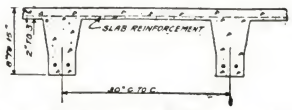


Fig. 7. Typical Section of Concrete Joist Floor

The most efficient type of reinforcement to take care of these various stresses is a fabricated mesh made from cold drawn high elastic limit wire with comparatively close spacing of members. The wire fabric specified should provide a minimum ratio of reinforcement area to concrete area of .0016, and under no consideration should shrinkage reinforcement members be spaced over two times the slab thickness.

Top Layer of Concrete Finished Floors—It is often desirable for construction reasons to leave the ¾ or 1-in. top dressing until after the main part of the slab is completely hardened. In this case the slab should be thoroughly cleaned before applying the final course, and this course should be reinforced with wire mesh reinforcement to prevent destructive cracks.

Specify Style 032 Triangle Mesh or 4x4-in. mesh No. 12 by No. 12 gauge wire Electrically Welded wire fabric.

Basement and Other Floors that Rest Upon the Ground—As conditions vary with each job, it is impossible to make any definite suggestions regarding the proper weight of fabric to use, but millions of square feet of Style 049 Triangle Mesh have been successfully used for this purpose. Where heavy loads and questionable fill-foundations occur, it will be economy to use heavier mesh, such, for instance, as Style 153 Triangle Mesh or an equivalent weight of Electrically Welded wire fabric having spacings of wires that do not exceed 6 in.

Flat Slab Beamless Floors—Wire fabric reinforcement has been successfully used for this type of construction. It can be furnished in rolls or flat sheets.

This material is most desirable and it is highly recommended.

Cement Gun Work—Gunite (trade-name) is concrete applied by the cement gun process, which produces probably the densest and, therefore, the most waterproof concrete available by present known methods.

Gunite reinforced with wire fabric reinforcement has repaired successfully old crumbling bridge piers, tunnel linings and sea walls; old steel bridges, tanks and trusses; leaky reservoirs and irrigation ditches; even wooden structures that have been damaged by fire have been restored to usefulness by this method. And repair work is by no means the most important class of work produced. All kinds of new construction, especially those requiring waterproof qualities with light resulting weight, can be successfully executed.

Fireproofing of Steel Framing—Wrap all steel columns, girders and beams with Triangle Mesh, Style 032, or Electrically Welded fabric, 4x4-in. mesh, all No. 12 gauge wires.

Concrete Chimneys—Style 153 Triangle Mesh is standard for the circumferential reinforcement.

Stucco Reinforcement—See Manufacturer's Index for page.

Concrete Sewers—The close spacing of members of Triangle Mesh is largely responsible for the successful results obtained with precast sewer pipe. The weight of fabric varies with the diameter of pipe, thickness of shell and depth of fill.

Concrete Driveways, Streets and Highways—Wire fabric reinforcement is essential to prevent destructive cracks. The purpose of the reinforcement is to increase the structural strength of the concrete slab and also to bind it together as a unit. The high tensile strength and the close spacing of members of a wire fabric show decided advantages for these purposes. The weight of wire fabric used in pavement has varied on account of varying conditions, but the average practice calls for 35 to 50 lb. per 100 sq. ft.

Suggested Specifications for Pavements—Reinforcement shall consist of steel wire fabric manufactured from cold drawn wire, finished members of which shall develop an ultimate tensile strength of at least 70,000 lb. per sq. in. and which shall bend cold 180° around a pin the diameter of which is equal to diameter of wire specimen without cracking on outside of bent portion.

All reinforcement shall be free from excessive rust, scale, paint or coating of any character which will tend to prevent proper bonding of the concrete.

The fabric reinforcement shall weigh not less than 40 lb. per 100 sq. ft.

The main or heavier wires of fabric shall be spaced not more than 6 in. apart. The secondary or lighter wires of fabric shall be spaced not more than 12 in. apart.

SLAB REINFORCEMENT, NEW YORK CITY CODE

For clear spans up to 8 ft. supported between structural steel beams only

STANDARD STYLES AMERICAN STEEL & WIRE COMPANY WIRE FABRIC REQUIRED FOR VARIOUS LOADS

TOTAL LOAD PER SQ. FT. INCLUDING WEIGHT OF SLAB		SPAN																
		4′ 0″	4′ 3″	4′ 6″	4′ 9″	5′ 0″	5′ 3″	5′ 6″	5′ 9″	6′ 0″	6′ 3″	6′ 6″	6′ 9″	7′ 0″	7′ 3″	7′ 6″	7′ 9″	8′ 0″
Electric Welded Reinforcement—4-in. Cinder Concrete Slabs, 1-2-5 Mixture																		
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	3 x 12
100 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	8 & 12	8 & 12	8 & 12
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	3 x 12	4 x 16	3 x 16
125 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	8 & 12	6 & 10	7 & 11	5 & 10
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	4 x 16
150 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	4 & 9
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	4 x 16
175 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	5 & 10	5 & 10	3 & 8
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	2 x 16	3 x 16	3 x 16
200 lb..	Gauge wire.....	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	5 & 10	5 & 10	7 & 11	4 & 9	4 & 9	
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	2 x 16	3 x 16
225 lb..	Gauge wire.....	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	4 & 9	5 & 10	3 & 8	4 & 9	6 & 10	3 & 8	
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	3 x 16	3 x 16	2 x 16	3 x 16	2 x 16	
250 lb..	Gauge wire.....	9 & 12	8 & 12	8 & 12	7 & 11	6 & 10	6 & 10	7 & 11	5 & 10	6 & 10	5 & 10	5 & 10	5 & 10	4 & 9	6 & 10	3 & 8	5 & 10	
	Wire spacing in..	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 16	3 x 16	3 x 16	3 x 16	3 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	
275 lb..	Gauge wire.....	8 & 12	8 & 12	7 & 11	6 & 10	6 & 10	7 & 11	6 & 10	6 & 10	5 & 10	5 & 10	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9
	Wire spacing in..	4 x 12	4 x 16	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	4 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	
300 lb..	Gauge wire.....	8 & 12	7 & 11	7 & 11	6 & 10	7 & 11	5 & 10	6 & 10	5 & 10	3 & 8	7 & 11	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	
	Wire spacing in..	4 x 16	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	4 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	
325 lb..	Gauge wire.....	7 & 11	7 & 11	6 & 10	7 & 11	5 & 10	6 & 10	5 & 10	3 & 8	7 & 11	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	3 & 8	
	Wire spacing in..	4 x 16	3 x 12	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	
350 lb..	Gauge wire.....	7 & 11	8 & 12	6 & 10	5 & 10	6 & 10	4 & 9	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	3 & 8	3 & 8	
	Wire spacing in..	4 x 16	4 x 16	3 x 16	3 x 16	4 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	
375 lb..	Gauge wire.....	7 & 11	6 & 10	7 & 11	6 & 10	4 & 9	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	3 & 8	3 & 8	3 & 8	
	Wire spacing in..	3 x 12	3 x 16	4 x 16	3 x 16	3 x 16	4 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	
400 lb..	Gauge wire.....	8 & 12	7 & 11	5 & 10	6 & 10	5 & 10	3 & 8	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	3 & 8	3 & 8	3 & 8	2 & 8	2 & 8	
	Wire spacing in..	4 x 16	3 x 16	4 x 16	4 x 16	3 x 16	3 x 16	3 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	
425 lb..	Gauge wire.....	6 & 10	7 & 11	4 & 9	4 & 9	5 & 10	4 & 9	4 & 9	3 & 8	5 & 10	4 & 9	4 & 9	3 & 8	3 & 8	3 & 8	2 & 8	2 & 8	1 & 7
	Wire spacing in..	3 x 16	4 x 16	4 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	
450 lb..	Gauge wire.....	7 & 11	5 & 10	4 & 9	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8	4 & 9	4 & 9	4 & 9	3 & 8	3 & 8	2 & 8	2 & 8	1 & 7	1 & 7
Electric Welded Reinforcement—4-in. Stone Concrete Slabs, 1-2-4 Mixture																		
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	
100 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12
125 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	8 & 12
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16
150 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	8 & 12	7 & 11	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	3 x 16	4 x 16
175 lb..	Gauge wire.....	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	8 & 12	7 & 11	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	4 x 16
200 lb..	Gauge wire.....	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	5 & 10	5 & 10	3 & 8
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	
225 lb..	Gauge wire.....	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	4 & 9	5 & 10	3 & 8	4 & 9	
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	2 x 16	3 x 16	2 x 16	
250 lb..	Gauge wire.....	10 & 12	9 & 12	8 & 12	8 & 12	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	5 & 10	5 & 10	7 & 11	4 & 9	6 & 10	6 & 10
	Wire spacing in..	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	2 x 16	2 x 16	3 x 16	2 x 16
275 lb..	Gauge wire.....	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	6 & 10	7 & 11	5 & 10	6 & 10	4 & 9	5 & 10	3 & 8	4 & 9	5 & 10	3 & 8	5 & 10	4 & 9
	Wire spacing in..	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 16	3 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	2 x 16	2 x 16	3 x 16	2 x 16
300 lb..	Gauge wire.....	9 & 12	8 & 12	7 & 11	7 & 11	6 & 10	7 & 11	6 & 10	4 & 9	5 & 10	3 & 8	4 & 9	5 & 10	3 & 8	4 & 9	6 & 10	3 & 8	5 & 10
	Wire spacing in..	4 x 12	4 x 16	4 x 16	3 x 12	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	4 x 16	3 x 16	2 x 16	2 x 16	3 x 16	2 x 16	2 x 16
325 lb..	Gauge wire.....	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	5 & 10	6 & 10	4 & 9	5 & 10	3 & 8	4 & 9	6 & 10	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9
	Wire spacing in..	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	3 x 16	3 x 16	3 x 16	3 x 16	4 x 16	3 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16
350 lb..	Gauge wire.....	8 & 12	7 & 11	8 & 12	6 & 10	7 & 11	6 & 10	6 & 10	5 & 10	3 & 8	4 & 9	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	3 & 8
	Wire spacing in..	4 x 16	4 x 16	3 x 12	3 x 16	4 x 16	3 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16
375 lb..	Gauge wire.....	7 & 11	7 & 11	8 & 12	7 & 11	5 & 10	6 & 10	5 & 10	3 & 8	4 & 9	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	3 & 8	3 & 8
	Wire spacing in..	4 x 16	3 x 12	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16
400 lb..	Gauge wire.....	7 & 11	8 & 12	7 & 11	5 & 10	6 & 10	4 & 9	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	3 & 8	3 & 8	3 & 8
	Wire spacing in..	4 x 16	4 x 16	3 x 16	3 x 16	3 x 16	3 x 16	2 x 16	3 x 16	2 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16
425 lb..	Gauge wire.....	7 & 11	6 & 10	7 & 11	6 & 10	6 & 10	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8	5 & 10	2 & 8	4 & 9	3 & 8	3 & 8	3 & 8	2 & 8
	Wire spacing in..	3 x 12	4 x 16	4 x 16	3 x 16	3 x 16	4 x 16	2 x 16	2 x 16	2 x 16	3 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16	2 x 16
450 lb..	Gauge wire.....	8 & 12	6 & 10	5 & 10	6 & 10	5 & 10	3 & 8	7 & 11	6 & 10	3 & 8	5 & 10	4 & 9	4 & 9	4 & 9	3 & 8	3 & 8	2 & 8	2 & 8

	Triangle Mesh Reinforcement—4-in. Cinder Concrete Slabs, 1-2-5 Mixture																
100 lb.	053P	053P	053P	053P	053P	053P	053P	053P	053P	062P	062P	072P	072P	084P	084P	084P	097P
125 lb.	053P	053P	053P	053P	053P	053P	062P	062P	072P	072P	084P	084P	097P	097P	097P	107	107
150 lb.	053P	053P	053P	053P	062P	062P	072P	072P	084P	084P	097P	097P	107	107	126	126	126
175 lb.	053P	053P	053P	062P	072P	072P	084P	084P	097P	097P	107	107	126	126	146	146	146
200 lb.	053P	062P	062P	072P	072P	084P	084P	097P	107	107	126	126	146	146	153	168	168
225 lb.	062P	062P	072P	072P	084P	097P	097P	107	107	126	126	146	146	153	168	180	208
250 lb.	062P	072P	072P	084P	097P	097P	107	126	126	146	146	153	168	180	180	208	208
275 lb.	072P	072P	084P	097P	097P	107	126	126	146	146	153	168	180	208	208	245	245
300 lb.	072P	084P	084P	097P	107	126	126	146	146	153	168	180	208	208	245	245	267
325 lb.	084P	084P	097P	107	107	126	146	146	153	168	180	208	208	245	245	267	287
350 lb.	084P	097P	097P	107	126	126	146	153	168	180	208	208	245	245	267	287	287
375 lb.	084P	097P	107	126	126	146	153	168	180	208	208	245	245	267	287	309	309
400 lb.	097P	107	107	126	146	146	168	180	208	208	245	245	267	287	287	309	336
425 lb.	097P	107	126	126	146	153	168	208	208	245	245	267	267	287	309	336	365
450 lb.	107	107	126	146	153	168	180	208	245	245	245	267	287	309	336	365	395

	Triangle Mesh Reinforcement—4-in. Stone Concrete Slabs, 1-2-4 Mixture or Equal																
100 lb.	053P	053P	053P	053P	053P	053P	053P	053P	053P	053P	062P	062P	062P	072P	072P	072P	084P
125 lb.	053P	053P	053P	053P	053P	053P	053P	053P	062P	062P	072P	072P	084P	084P	097P	097P	097P
150 lb.	053P	053P	053P	053P	053P	053P	062P	062P	072P	072P	084P	084P	097P	097P	107	107	126
175 lb.	053P	053P	053P	053P	062P	062P	072P	072P	084P	084P	097P	097P	107	107	126	126	146
200 lb.	053P	053P	053P	062P	062P	072P	084P	084P	097P	097P	107	107	126	126	146	146	146
225 lb.	053P	053P	062P	072P	072P	084P	084P	097P	097P	107	126	126	126	146	146	153	168
250 lb.	053P	062P	072P	072P	084P	084P	097P	107	107	126	126	146	146	153	168	168	180
275 lb.	062P	072P	072P	084P	097P	097P	107	107	126	126	146	146	153	168	180	208	208
300 lb.	062P	072P	084P	084P	097P	097P	107	126	126	146	146	153	168	180	208	208	245
325 lb.	072P	072P	084P	097P	107	107	126	126	146	146	168	168	180	208	208	245	245
350 lb.	072P	084P	097P	097P	107	126	126	146	146	153	168	180	208	208	245	245	267
375 lb.	084P	084P	097P	107	126	126	146	146	153	168	180	208	208	245	245	267	287
400 lb.	084P	097P	097P	107	126	126	146	153	168	180	208	208	245	245	267	287	287
425 lb.	084P	097P	107	126	126	146	153	168	180	208	208	245	245	267	267	287	309
450 lb.	097P	097P	107	126	146	146	153	168	208	208	245	245	267	267	287	309	336

CONCRETE ENGINEERING COMPANY

Meyer Steelforms, Ceco Reinforcing Bars and Fireproofing Materials

GENERAL OFFICE
OMAHA, NEB.

SALES OFFICES AND WAREHOUSES

CHICAGO, Trustees System Building
CICERO, 1926 So. 52nd Avenue
CLEVELAND, 8219 Almira Avenue
DALLAS, Construction Building
DES MOINES, Hubbell Building
DETROIT, 909 Guaranty Trust Building
HOUSTON, 2814 Pease Avenue
KANSAS CITY, Walsix Building
LOS ANGELES, 1450 Mirasol Street
MILWAUKEE, Bartlett Building
MINNEAPOLIS, 2801 E. Hennepin Avenue
OKLAHOMA CITY, 502 Franklin Building
ST. LOUIS, 817 Louderman Building
SAN ANTONIO, 507 Milan Building
SAN FRANCISCO, 1280 Indiana Street

Products

CECO REINFORCING BARS; MEYER REMOVABLE FLANGE TYPE AND ADJUSTABLE TYPE STEELFORMS FOR CONCRETE JOIST FLOOR CONSTRUCTION; WELDED AND TRIANGLE FABRIC; METAL LATHING MATERIAL; ROUND COLUMN FORMS; BAR CHAIRS AND SPACERS; ROADSTRIP; ADJUSTABLE SHORES AND COLUMN CLAMPS.

For other Ceco Products, see pages in this edition on Metal Weatherstrips, Metal Framed Screens, Steel Windows and Steel Doors, as listed in Products Index.

Ceco AND MEYER PRODUCTS

Meyer Steelform Construction

Meyer Steelform Construction is a standard system that represents the highest type of concrete joist floor construction in present day use. It consists of rows of heavy gauge removable steelforms, separated by reinforced concrete joists, and covered by a thin slab of concrete. Metal lath furring may be used beneath to provide a flat ceiling for plastering.

Meyer Steelforms are handled on a rental basis only. Ordinarily the labor of installing and removing the steelforms by our skilled workmen is included with the rental charge. The economy in the re-use of Meyer Steelforms on a rental basis is readily apparent.

Ceco Reinforcing Bars

Ceco Reinforcing Bars are rolled from new billet steel and are furnished both as plain rounds and as deformed rounds and squares. On the deformed bars the lugs are at right angles to the main axis of the bar, and thus provide the most positive kind of mechanical bond to aid the adhesion of the concrete to the steel in resisting bond stresses existing in reinforced concrete members. Reinforcing bars rerolled from steel rails are used in some localities. This type of bar is available at our warehouses in the plain and deformed section and can be furnished promptly, cut to length and bent, or in stock lengths.

Ceco Welded and Triangle Fabric

Ceco Electrically Welded and Triangle Fabric consists of cold drawn wires welded or woven together, forming a closely spaced mesh of square, rectangular or triangle shape, and is particularly adapted for many uses as tension reinforcement for concrete.

Ceco Metal Lathing Material

Ceco Metal Lathing Material includes expanded metal lath, rib lath, all types of corner bead, base bead and picture mould, hot or cold rolled furring channels, pencil rods, angles, tees, flats and tie wire.

Ceco Accessories

Ceco Accessories include all types of metal or wire beam, joist and slab bar spacers, screed chairs, bar ties, reed clips and anchor slots.

Ceco Service

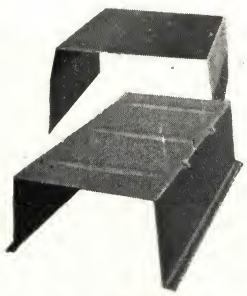
Warehouses located at strategic centers guarantee immediate shipment of Ceco and Meyer products to the building or construction site.

Catalogues

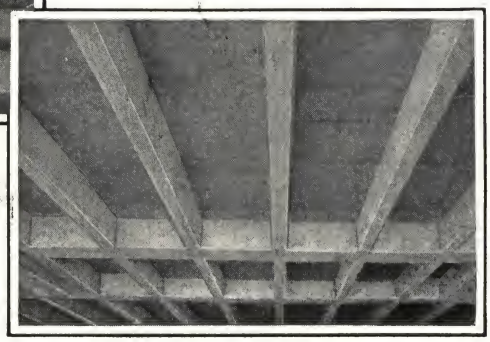
Complete descriptive catalogues on any of the above products furnished free of charge on request.

Placing Meyer Steelforms
Note the simple open wood centering required—a feature that saves time, labor and materials

Meyer Steelforms in Place
Ready for placing of concrete. Results like this, delivered on time, save money all along the line



Meyer Steelforms
Extremely rigid, thus maximum re-use is secured



Right:
View of Open Ceiling
Illustrating the clean-cut attractive results of concrete joist floor construction

CONCRETE STEEL COMPANY

2 Park Avenue, NEW YORK, N. Y.

SALES OFFICES

CHICAGO, ILL. PHILADELPHIA, PA. PITTSBURGH, PA. ST. PAUL, MINN. BIRMINGHAM, ALA.
DETROIT, MICH. BOSTON, MASS. SYRACUSE, N. Y. WASHINGTON, D. C. MILWAUKEE, WIS.

WAREHOUSES AND FABRICATING WORKS

CHICAGO, ILL. YOUNGSTOWN, OHIO PHILADELPHIA, PA. NEW YORK, N. Y. BOSTON, MASS.
BIRMINGHAM, ALA. ST. PAUL, MINN. DETROIT, MICH.

Products

CONCRETE REINFORCEMENT BARS; COLLAPSIBLE SPIRALS for column reinforcement; REMOVABLE METAL FORMS; CONCRETE INSERTS; CURB BARS; CONCRETE REINFORCEMENT DEVICES, including SUPPORTING, SPACING and TYING DEVICES for holding bars in place in forms; WIRE DEVICES; WIRE SOFFIT CLIPS; WALL ANCHORS and TIES; EXPANDED METAL LATH (Plain and Self-furring); EXPANDED METAL REINFORCEMENT; HOT ROLLED and COLD FORMED CHANNELS; CORNER BEADS; RIB LATH.

Also Safety Stair Treads.

For Havemeyer Steel Joist, see Manufacturers' Index.

Engineering Departments

Experienced and efficient engineering departments are maintained in our district sales offices. This organization, which includes the highest grade of engineering talent in its line, will lend every assistance in connection with all concrete reinforcement problems.

Havemeyer Concrete Reinforcement Bars

These deformed bars (Figs. 1 and 2) are rolled in square and round sections, with the deformations running longitudinally and entering directly into the tensile strength of the bar, no metal being used for the mechanical bond only.

At all points they have constant uniform area of cross

Fig. 1. Round

Fig. 2. Square

section exactly equal to the cross-sectional area of a plain bar of same size.

As the projections and depressions are rolled longitudinally, there are no sharp angles to start a fracture when bar is bent. Tests prove the very superior bending qualities of Havemeyer bars.

Specifications for Steel—Havemeyer bars are rolled to any desired standard specification from new billet steel.

Shop Bending and Fabricating—Our warehouses are equipped for accurately bending and fabricating bars. This service eliminates a bending gang and bending machines on the job. Our warehouse charges for bending are less than it would cost the contractor if he did the work himself. Furthermore, shop bending assures the architect that every bar is bent accurately.

Fabricated units can be made up in our warehouses by using Havemeyer Beam-Saddles, Bar-Tys, etc. This assures proper spacing and placing of bars.

Collapsible Spirals

Wire is accurately coiled to proper diameter and correctly spaced with a rigid spacer. Shipped collapsed, ready to be opened up and placed in the forms.

Removable Metal Forms

Removable metal forms in a wide range of dimensions, adapted to all types of buildings designed for concrete joists, are available to contractors on a rental basis. Full information furnished by our district offices.

Concrete Inserts

Dayton Adjustable-Inserts—Malleable iron, cast in one piece with keyhole slot for adjustment.

Havemeyer "Y" Socket-Inserts—Highest grade malleable iron. Broad nailing base with four *nailing* holes insures against displacement.

Havemeyer Slotted-Inserts—Pressed steel. placed end to end, unlimited adjustment obtainable.

Havemeyer Curb Bars

We make round nose and angle nose curb bars for curb edge protection, stair nosings and platform edges.

Havemeyer Devices for Supporting, Spacing and Tying Bars in Forms

Consist of Bar-Tys, Hy-Chairs, Ty-Chairs, Easel-Chairs, Securo Bar-Spacers, Beam-Saddle and Separators.

These devices offer many decided advantages. The designer knows that every bar is exactly in its intended position. The bars are held rigidly and at the correct distance apart; they are also kept at proper distance above the forms.

Wire Devices

Soffit clips; hanger wire, straight, cut and bent; toggle hangers, etc.

Our wire shops are prepared to manufacture, on short notice, any type of wire device required for the installation of suspended ceilings or for securing lath. Tie wire, staples, etc., carried in stock.

Security Anchor and Wall-Tys

For bonding brick veneer, stone, terra cotta and tile wainscoting to walls, etc.; for suspending metal lath ceilings and for holding floor sleepers, screeds, nailing strips, etc.

Havemeyer Expanded Metal

Complete information furnished on request.

Havemeyer Furring

Hot rolled channels, angles and flats.
Cold rolled channels, ¾, 1, 1½ and 2 in.

Havemeyer Corner Beads

Expanded, wing, rail and bull nose types. Lengths, 6, 7, 8, 9, 10 and 12 ft.

Havemeyer Base Beads

Expansion, plain and curved point.

Havemeyer Metal Lath

Is made in flat expanded, flat rib, ⅜-in. rib, ¾-in. rib and perforated sheet.

Weights as follows:

Flat Expanded, Painted—2.2, 2.5, 3 and 3.4 lb. per sq. yd.
Flat Expanded, Galvanized—2.5 and 3.4 lb. per sq. yd.
Flat Rib, Painted—2.75, 3.0, 3.4 and 4.0 lb. per sq. yd.
Flat Rib, Galvanized—3.6 lb. per sq. yd.
⅜-in. Rib, Painted—2.75, 3.0, 3.4 and 4.0 lb. per sq. yd.
¾-in. Rib—46, 56 and 74 lb. per 100 sq. ft.
Perforated Sheet—4.5 lb. per sq. yd.

Wire Mesh

Both triangle and electric weld in plain and galvanized, all standard weights and areas.

Catalogue

Complete descriptive catalogue on request.

THE CONSOLIDATED EXPANDED METAL COMPANIES

Steelcrete Building, WHEELING, W. VA.

SALES OFFICES AND WAREHOUSES

BOSTON, MASS., 137 Washington Street, Somerville
BUFFALO, N. Y., 2 Ganson Street
CHICAGO, ILL., 2531 Arthington Street
PITTSBURGH, PA., 6626 Hamilton Avenue
CLEVELAND, OHIO, 13107 St. Clair Avenue
NEW YORK, N. Y., 103 Park Avenue
PHILADELPHIA, PA., 1075 Germantown Avenue
DETROIT, MICH., 4015 Michigan Avenue

FOREIGN SALES OFFICE, 152 West 42nd Street, NEW YORK, N. Y.

Product

STEELCRETE CONCRETE REINFORCING MESH, a diamond mesh fabric furnished in large, flat sheets.

STEELCRETE WELDED WIRE FABRIC.

For Steelcrete Industrial Mesh and Accessories for construction of door and window guards and protective panels, and Steelcrete Bank Vault Construction, see Manufacturers' Index.

Steelcrete Service

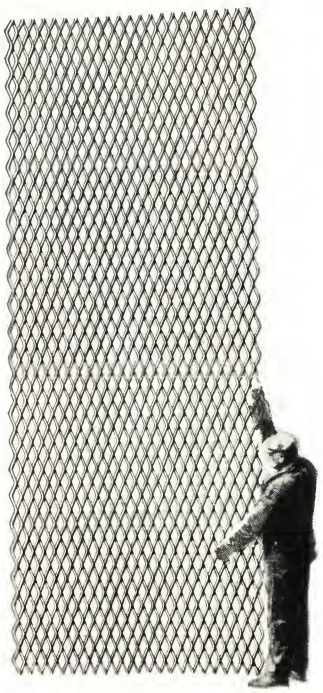
Immediate shipments can be made from our plant at Beech Bottom, W. Va., or branch warehouses listed above.

Steelcrete Reinforcing Mesh

Steelcrete Reinforcing Mesh is a diamond mesh fabric, cold drawn from a solid steel plate and has an elastic limit 60% higher than commercial medium steel. In the process of manufacture every strand is tested against flaws and other weaknesses, assuring a uniform mesh of high elastic limit. Steelcrete Mesh is free from mechanical and welded joints, the fabric being one solid sheet.

Steelcrete Mesh provides two-way reinforcement as well as the diagonal reinforcement, not ordinarily taken care of. It is furnished in large, flat sheets, suitable to all types of construction, easy to handle and costs less "in place" than many materials having considerably lower reinforcing values.

Steelcrete Mesh is especially adapted for use in tunnels, tanks, sewers, culverts, retaining walls and concrete floor laid on the ground.



Large Flat Sheet of Steelcrete Reinforcing Mesh

Specifications—The Steelcrete Mesh shall be laid on the forms with long way of the diamond meshes extending in the direction indicated on the drawings. The separate sheets shall be lapped one mesh on the side and one mesh on the end, and wired together at a sufficient number of points for the purpose of holding sheets in position while depositing the concrete.

STANDARDS FOR "STEELCRETE" EXPANDED METAL

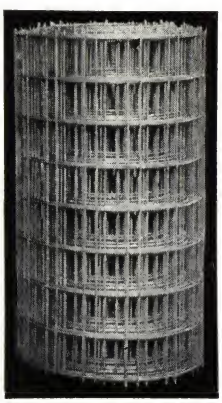
Designation of mesh	Effective sectional area sq. in. per ft. width	Approx. weight per sq. ft., lb.	Standard width of sheets, ft.–in.	Standard length of sheets, ft.
3–13–075	.075	.25	6′–4″	8, 10, 12, 16
3–13– 10	.10	.34	7′–0″	8, 10, 12, 16
3–13–125	.125	.42	5′–8″	8, 10, 12, 16
3– 9– 15	.15	.51	7′–0″	8, 10, 12, 16
3– 9–175	.175	.60	6′–0″	8, 10, 12, 16
3– 9– 20	.20	.68	5′–3″	8, 10, 12, 16
3– 9– 25	.25	.85	4′–2½″	8, 10, 12, 16
3– 9– 30	.30	1.02	7′–0″	8, 10, 12, 16
3– 9– 35	.35	1.19	6′–0″	8, 10, 12, 16
3– 4– 40	.40	1.36	4′–7″	8, 12, 16
3– 4– 45	.45	1.53	4′–1″	8, 12, 16
3– 4– 50	.50	1.70	7′–4″	8, 12, 16
3– 4– 55	.55	1.87	6′–8″	8, 12, 16
3– 4– 60	.60	2.04	6′–1½″	8, 12, 16

Note: Sheets of special size furnished from the factory only. All the above sizes are furnished in a standard diamond 8 in. long and approximately 3 in. wide.

Steelcrete Welded Wire Fabric

Steelcrete Welded Wire Fabric is an electrically welded wire fabric furnished in rolls or flat sheets in various gauges and spacing of wires.

The wire is manufactured to American Society of Testing Material specifications.



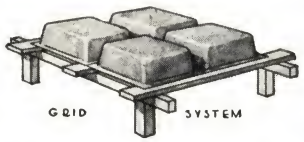
Steelcrete Welded Wire Fabric

GRID FLAT SLAB CORPORATION

761 Dudley Street, BOSTON, MASS.

Grid System

New and economical flat slab form of construction for floors and roofs, made upon removable steel domes. This method is a two-way rib section of reinforced concrete acting to support a lighter floor slab. By cutting out all useless concrete between the ribs there is considerable concrete and reinforcing steel saved. This saving of concrete and steel cuts the dead weight materially and permits of wider spans and column spacings—bays have been constructed up to 32 ft. square.



Calculations for Grid System—The calculations for the Grid Flat Slab are identical with those of the usual two-way flat slab. Standard specifications for concrete and reinforced concrete for flat slabs apply to Grid Flat Slabs.

These formulas are recommended for use where there are no definite building laws. Where architects or engineers design without set codes, the method taken with usual two-way flat slab designs can be taken with Grid Flat Slab.

Thickness of Slab and Depth of Dome to Be Used—The thickness of the Grid Slab and the depth of the dome required for any structure are determined by the weight to be carried and the span or spacing of the columns. The same method of determining the thickness of the ordinary flat slab should be employed. The rule is that the slab should be $\frac{1}{32}$ of the column span. The depth of the dome plus the thickness of the slab above should usually be at least 1 in. greater than the usual flat slab. The slab should never be less than 2 in. on top of the dome, the depth depending on the concentrated load.

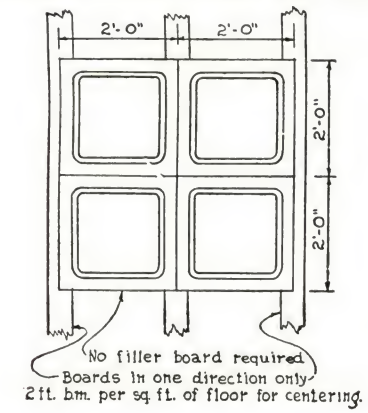
Steel Domes—The size of the removable steel domes is shown in the following illustration. Each 8-in. dome displaces 1½ cu. ft. of concrete.

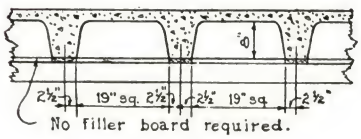
Wood Forms—The domes require support by narrow boards 2 ft. apart extending in *one direction only*. In the majority of designs the bottoms of the plinths are flush with the bottoms of the ribs, thus doing away with the expense and delay of forming dropped panels.

Placing Reinforcing Steel—*Reinforcing steel can not be misplaced or left out.* The steel is placed, one or two bars in the ribs and the steel man can not misplace it or leave it out, by mistake, without it being noticed.

Inserts and Electric Conduit—All inserts and conduits can be placed in the Grid Flat Slab the same as regular slab. Outlet boxes in ribs, large junction boxes in slab. Inserts can be placed as desired and held firmly in place with a small device. Floor drainers, if large, by leaving out a dome—extra concrete will support it.

Pouring of Concrete—The domes are No. 16 gauge steel. The tops are flat and stiff enough to support a runway to wheel concrete to point of placing. Screeds can be placed on domes to assure correct and equal thickness of concrete in placing.



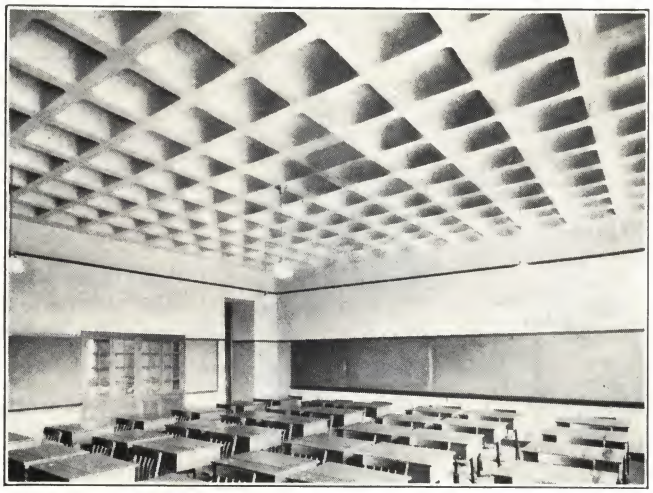


Availability of Steel Domes — The steel domes for the Grid System are available in quantities large enough for any job and can be supplied on short notice.

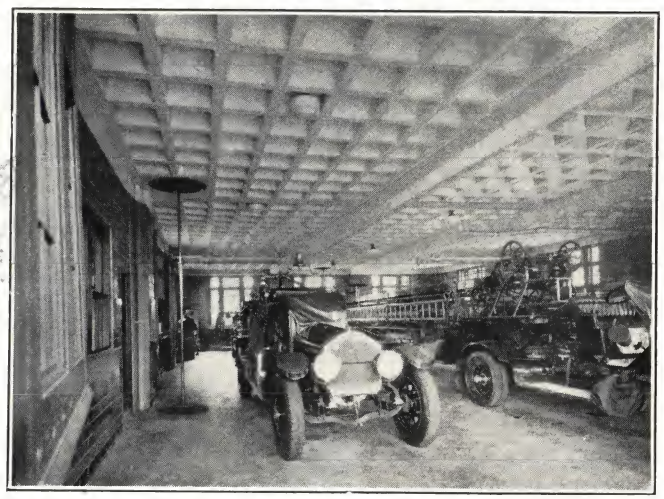
Domes and System Patented — The steel domes for the Grid System as well as the type of construction are patented and patents owned by the GRID FLAT SLAB CORPORATION.

Service

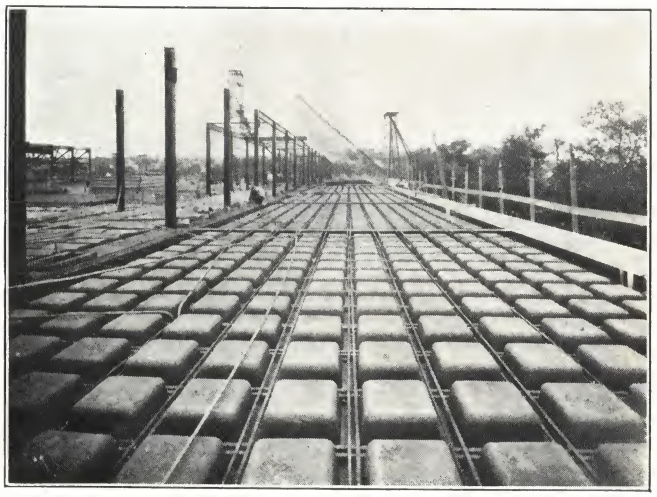
The engineers of GRID FLAT SLAB CORPORATION will act as consulting engineers with architects and engineers on any Grid design and will furnish, place, oil and remove domes.



Brighton High School, Boston, Mass.
O'CONNELL & SHAW, Architects JOHN J. HARTY, Engineer
Just completed; $1,300,000 approximate cost



Brighton Fire Station, Boston, Mass.
RALPH T. JACKSON, Architect FAY, SPOFFORD & THORNDYKE, Engineers



Eastern Senior High School, Lynn, Mass.
SANBORN & WEED, Architects J. R. WORCHESTER & Co., Engineers
Just completed; $1,500,000 approximate cost

THE HAUSMAN STEEL COMPANY

Concrete Form Contractors

TOLEDO, OHIO

Flat Slab Construction

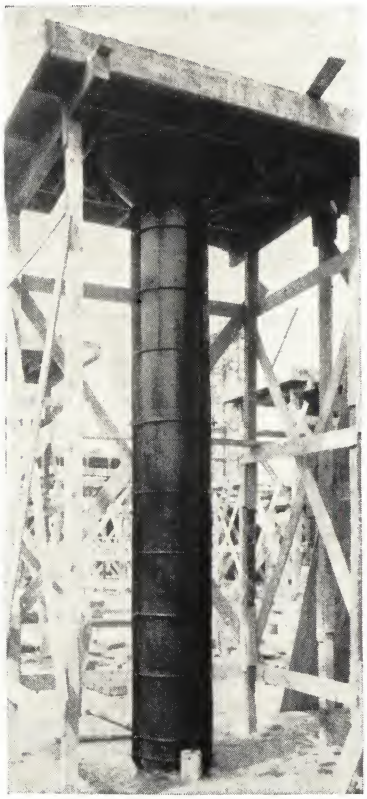
Products and Service

REMOVABLE STEEL FORMS for Concrete Joist Construction; REMOVABLE STEEL FORMS for Flat Slab Concrete FLOORS; STEEL COLUMN MOULDS for Circular Concrete Columns.

Also Heavy Gauge Steel Tile and Steel Forms for any purpose that involves sufficient duplication.

An Engineering Organization that designs or redesigns reinforced concrete structures for most economical construction.

Quotations are made for furnishing forms on a lease-only basis, or erected in place complete.



Column Mould with Drop Head Ready for Flat Slab Shoring and Panels

Flat Slab System

The flat slab system shown above is used where heavy floor loads are involved, as in factories, warehouses and the like. Steel panels rest on minimum of wood shoring. No bolts or fastenings are required. Panels are stripped without removing or disturbing shoring. Panels are of 14-gauge sheet steel in sizes readily handled by one man on the job.

Concrete Joist Construction

Concrete Joist Construction

This system is most economical in buildings of light occupancy, such as hotels, apartments, office buildings and schools. Note that steel channel soffits insure uniform width of joists, and spreaders act as chairs for reinforcing steel. Hairpin hangers are supplied for attaching ceiling lath. Forms are 14-gauge material in depths of 6, 8, 10, 12 and 14 ins. Joists are 5 ins. wide, 25-in. centers.

Not just another pan system, but includes centering under pans.

Adjustable Circular Column Forms

These forms are used with flared heads in flat slab construction, and without heads in beam and girder construction whenever round columns are desired. Heavy circular steel bands and wedges draw and hold the forms to a true circle. Hausman Column Forms are adjustable in diameters of even inches and to head diameters of every 6 ins. from 42 to 72 ins. They are adjustable to any height by telescoping of sections.

Write for descriptive literature and valuable data on concrete quantities and design tables.

FOUNDED 1850

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS

Jones & Laughlin Building, PITTSBURGH, PA.

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Telephone, Washington 0268

CHICAGO, ILL., 111 W. Washington Street
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CLEVELAND, OHIO, Union Trust Building
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Telephone, Vandike 6178

MEMPHIS, TENN., 1 Auction Avenue
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PITTSBURGH, PA., Jones & Laughlin Building
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ST. LOUIS, MO., Boatmen's Bank Building
Telephone, Garfield 4075

SAN FRANCISCO, CAL., Standard Oil Building
Telephone, Douglas 1776

CANADIAN REPRESENTATIVES: JONES & LAUGHLIN STEEL PRODUCTS COMPANY

PITTSBURGH, PA., U. S. A., Jones & Laughlin Building
Telephone, Court 3240

TORONTO, ONT., CANADA, Toronto Daily Star Building
Telephone, Adelaide 0022

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NEW ORLEANS, LA.—Telephone, Franklin 1131
PITTSBURGH, PA.—Telephone, Hemlock 1000

Products

J & L BARS for Concrete Reinforcement.

Also J & L Structural Shapes and Fabricated Structural Work, Columns, Girders, Trusses, Plate Work, Tanks, Mill and Factory Buildings; J & L Wire Products.

For J & L Junior Beams, Light Weight Channels for Stair Stringers and other uses, and Tubular Products, see Manufacturers' Index.

J&L STEEL

Description—Concrete Reinforcement Bars

J & L Diamond Bars are rolled from new billet steel and are tested to standard specifications. Each has uniform cross section carrying the stresses evenly. Ribs are clean cut and accurate, balancing each other in two opposite spirals. The ribs run at angles of 45°, giving maximum areas to insure bond.

There are no sharp edges or corners, thereby assuring intimate and thorough contact with the concrete. Sizes are easily identified, round sections for the standard round equivalents, gothic sections for the standard square equivalents.

J & L Round Equivalent Deformed

J & L Square Equivalent Deformed

STANDARD SIZES CONCRETE REINFORCEMENT BARS

Size, in.	Area, sq. in.	Weight per ft.
¼ round	.05	.167
⅜ round	.11	.376
½ round	.20	.668
½ square	.25	.850
⅝ round	.31	1.043
¾ round	.44	1.502
⅞ round	.60	2.044
1 round	.79	2.670
1 square	1.00	3.400
1⅛ square	1.27	4.303
1¼ square	1.56	5.313

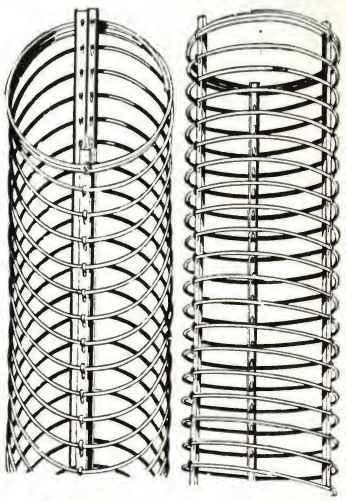
*Furnished in plain round.

Column Spirals

Spirals are fabricated with two or more channel spacers as desired. This permits the spirals to be shipped collapsed ready to set in forms.

STANDARD SIZES SPIRAL WIRE

Size, in., plain round	Area, sq. in.	Wt., per ft., lb.
¼	.05	.167
⅜	.11	.376
½	.20	.668
⅝	.31	1.043



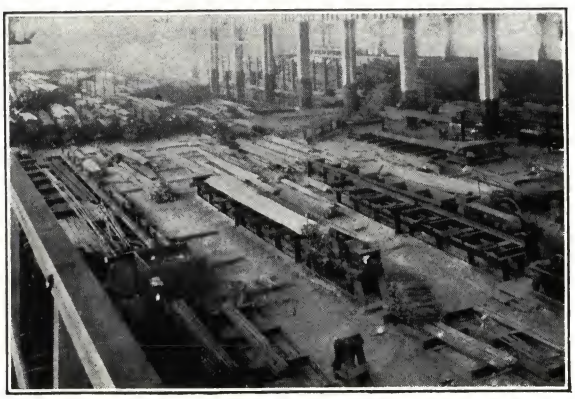
Collapsed **Set Up**

A complete stock of standard sizes is carried in both hot rolled and cold drawn wire. Quick shipment assured.

Warehouse Service

We carry large stocks of reinforcing bars, so that unusual requirements, as well as those of ordinary nature, are taken care of promptly.

We are in a position to cut and bend bars in accordance with bar lists and bending details as submitted.



Bar Bending Bay, J & L Concrete Reinforcement Bar Warehouse, Pittsburgh, Pa.

KALMAN STEEL CORPORATION

SUBSIDIARY OF BETHLEHEM STEEL CORPORATION

Manufacturers of Concrete Reinforcement Products

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WASHINGTON, D. C.
YOUNGSTOWN, OHIO

EXPORT DISTRIBUTORS: Bethlehem Steel Export Corporation, NEW YORK, N. Y.

Products

CORRUGATED BARS for concrete reinforcement; complete line of CONCRETE ACCESSORIES including SPACERS, CHAIRS, INSERTS, SLEEPER ANCHORS; ANCHOR SLOT, STEEL TILE; COLUMN FORMS and SPIRALS, WIRE FABRIC.

Also other related products.

For Kalmantruss Joists and Steel Door Frames, see Manufacturers' Index.

Engineering Service

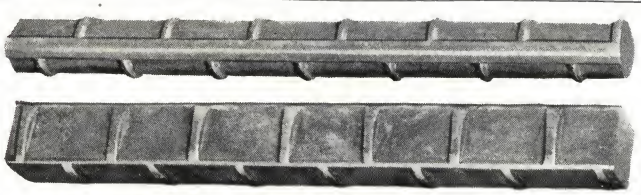
Expert engineering service is one of the most valuable features of the KALMAN STEEL CORPORATION Service. At all district sales offices expert help is available on matters of estimate, design, and detail of reinforced concrete structures of all types, together with advice concerning the use and purposes of all Kalman products.

Corrugated Bars

Deformed bars of highest grade steel, rolled from new billets, and also from rails, in square and round sections in accordance with the following schedule.

STANDARD SIZES CORRUGATED BARS

Round			Square		
Size, in.	Net area, sq. in.	Weight per ft., lb.	Size, in.	Net area, sq. in.	Weight per ft., lb.
¼	.05	.17	½	.25	.86
⅜	.11	.38	1	1.00	3.44
½	.20	.68	1⅛	1.27	4.35
⅝	.31	1.06	1¼	1.56	5.37
¾	.44	1.52			
⅞	.60	2.07			
1	.79	2.70			



Round and Square Corrugated Bars

Removable Tile

Kalman Removable Steel Tile is used in forming reinforced concrete ribbed slabs in buildings. Because of the large investment involved, the tile is leased instead of sold to the contractor and is erected by our field organization, the Corr Service Erection Co.

Kalman Removable Steel Tile actually saves time, labor, and money. The tile is kept in perfect condition, cleaned, and re-formed after every job. Complete information can be had on request.

Anchor Slot

Kalman Anchor Slot and Anchors conform to all requirements of modern building practice and embody features of strength and simplicity that make them highly desirable from all standpoints—economy, ease of installation and dependable performance. A positive bond between concrete surfaces and masonry veneers, face brick, stone, or terra cotta is provided. Kalman Anchor Slot is made of 24 gauge galvanized steel to essentially a T-section. It insures a uniform and sufficient thickness of the concrete ledges against which anchors exert their pull. A tight veneer anchorage is certain.

Anchor Slot Inserted

Anchor Slot Locked Behind Bearing Ledges

Column Forms

Adjustable metal forms strongly and simply made. They produce true round columns with accurate and graceful profiles where the flared head merges with the shaft. Kalman Column Forms are furnished to contractors on a lease and erection basis.

Column Form

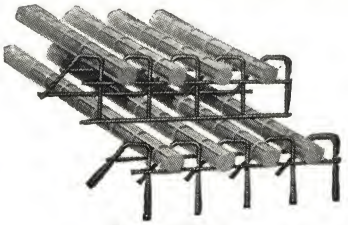
Bar Supports and Spacers

Kalman offers a complete line of bar supports and spacers to aid in the accurate and economical setting of reinforcing steel. These products include the new Kalman High Chair (for use with either tees or bars), beam chairs, rib chairs, bar chairs, beam bolsters, bar clips, and several types of slab spacers.

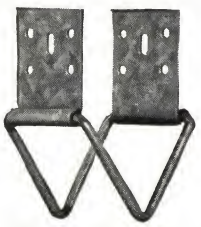
The New Kalman Slab Spacer (Clip Type)

Other Products

In addition to the line of bar supports and spacers, Kalman offers the new screed chair, adjustable and hanger inserts and sleeper anchors. Write for bulletins.



Beam Chairs



Sleeper Anchor

THE R. C. MAHON COMPANY

Manufacturers of Permanent Steel Floor Forms

DETROIT, MICH.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

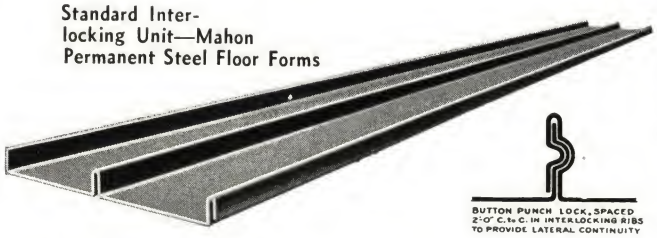
Product

MAHON PERMANENT STEEL FLOOR FORMS.

For Mahon Steel Roof Deck, Kalamein and Tin Clad Doors, Rolling Steel Doors and Cast Iron Roof Sumps, see Manufacturers' Index.

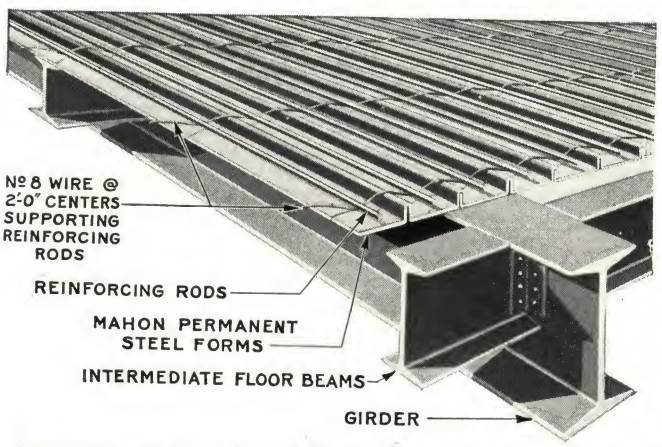
Mahon Permanent Steel Floor Forms

Rolled from 18 and 20-gauge tight-coated, galvanized copper bearing steel, this interlocking form provides a unique system of rapid construction for multiple story buildings where concrete floors are employed. Mahon continuous, interlocking, permanent floor forms are furnished in any length up to 12 ft. 4 in. and can be easily and quickly placed.



Economy

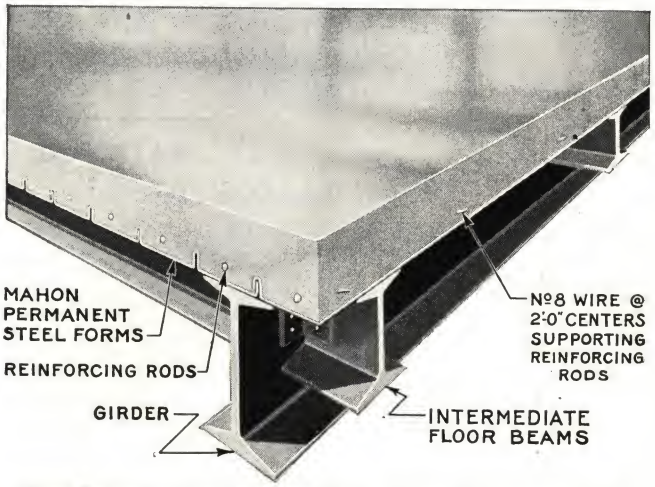
Through the elimination of costly wood formwork and all shoring, this system of floor construction offers a tremendous saving in time, material and labor. The absence of shoring between floors permits other trades to proceed without interference. All floors may be poured at one time, with no dripping or seepage through forms, and there is no shoring or formwork to remove after the concrete has set.



Cross Section of Mahon Interlocking Steel Forms Showing Application and Position of Reinforcing Rods

Appearance

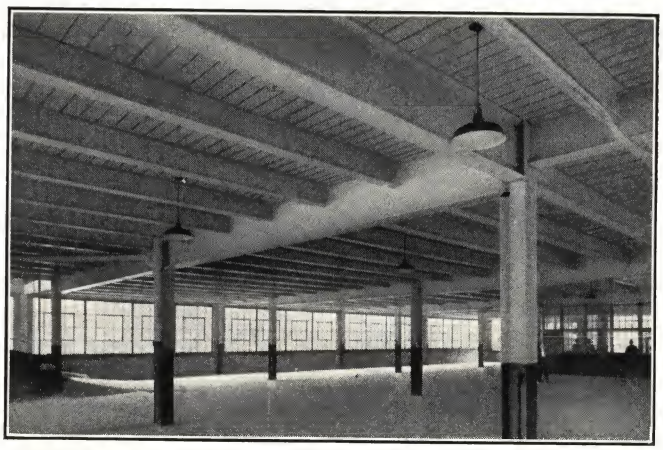
Mahon Interlocking Steel Floor Forms are permanent—presenting a smooth ceiling surface easy to keep clean and pleasing in appearance. For every type of commercial or industrial building, the Mahon system of floor construction may be used to a decided advantage.



Cross Section of Finished Floor Slab in Typical Construction with Mahon Permanent Interlocking Steel Floor Forms

ENGINEERING DATA

Total live and dead load, lb.	Reinforcing steel		Maximum beam spacing	
	3½-in. slab	4-in. slab	20-gauge	18-gauge
100	¼" Ø	¼" Ø	5′ c to c	6′ c to c
125	¼" Ø	¼" Ø	5′ c to c	6′ c to c
150	¼" Ø	¼" Ø	5′ c to c	6′ c to c
175	5/16" Ø	5/16" Ø	5′ c to c	6′ c to c
200	5/16" Ø	5/16" Ø	5′ c to c	6′ c to c
250	3/8" Ø	5/16" Ø	5′ c to c	6′ c to c



Ceiling Effect at the Standard Chevrolet Sales, Lansing, Mich., Where Mahon Permanent Steel Floor Forms Were Used for a Multiple Story Garage Building

NATIONAL STEEL FABRIC COMPANY

DIVISION OF PITTSBURGH STEEL COMPANY

902 Union Trust Building
PITTSBURGH, PA.

DISTRICT SALES OFFICES AND WAREHOUSES

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BUFFALO	CINCINNATI	HOUSTON	NEW YORK	PORTLAND	SAN ANTONIO	SEATTLE	WASHINGTON

For Steeltex Welded Wire Mesh for Interior Plaster, Stucco, Brick and Stone Veneer, see Manufacturers' Index

REINFORCING FOR CONCRETE, PLASTER, STUCCO, BRICK AND STONE VENEER CONSTRUCTION

National Steel Fabric Company's reinforcing may be grouped into three distinctive types: National Reinforcing Flat Open-Mesh Fabric; National Reinforcing Crimped Open-Mesh Fabric; and Steeltex, steel fabric with integral backing.

The basic fabric for all three types is an electrically welded wire fabric of square or rectangular mesh, furnished in various gauges and spacings of wires. The fabric is manufactured from a high-grade cold-drawn (new billet) steel wire which is furnished with either plain or galvanized finish. The wire of which the fabric is made has high tensile strength (70,000 to 90,000 lb. per sq. in.) together with elastic and ductile properties of such a character as to render it especially suitable for reinforcement of concrete, stucco, or plaster.

National Reinforcing and Steeltex are distinguished from other types of woven or twisted mesh in that the longitudinal and transverse members are not connected by any form of wraps, clips, or ties. In National Reinforcing and Steeltex, rigidity of the mesh is obtained by welding, or more properly by actually fusing together the transverse and longitudinal members at every point of intersection by means of electricity.

NATIONAL REINFORCING

TRADE-MARK REG. U.S. PAT. OFF.

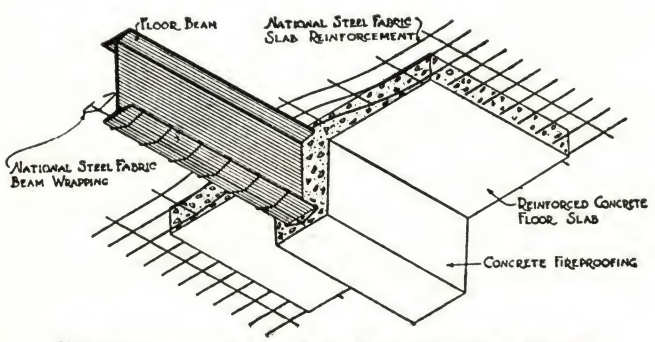
Flat Open-Mesh Fabric

Having square or rectangular mesh and furnished in a wide variety of gauges and spacings ranging from the lightest to the heaviest limits of manufacture. Furnished either in rolls or sheets and susceptible to a wide range of sectional-area requirements, this type is adapted to the widest scope of general use as reinforcement for concrete floors, beam-and-slab, ribbed or ground-floor construction; for concrete driveways, sidewalks, retaining walls, concrete pipe, sewers, culverts, conduits, reservoirs, oil and water tanks; for concrete and gypsum poured and precast roofs; for beam and column wrapping, fireproofing steel framework, levee work, canal lining, etc. Also for concrete roads, as well as for concrete bases for roads having brick, asphalt, and other surfaces.

The outstanding structural advantages of National Reinforcing which render it a most efficient and economical material for reinforcing types of so-called plastic construction may be summarized as follows:

(1) Cold-drawn wire (not hot-rolled bars).
(2) High tensile strength combined with proper ductile properties.
(3) Large sheets or rolls (not loose individual members).
(4) Spacing of members accurately fixed by machinery at factory.
(5) Rigid, welded connections, no clips, twists, wraps or ties.

Method of Wrapping a Steel Column with National Reinforcing



Slab Reinforcement and Beam Wrapping Using National Reinforcement

(6) Square or rectangular mesh, no zigzag criss-cross members to obstruct the flow of concrete.
(7) Every pound efficient reinforcement, no "idle" or non-effective material at intersections.
(8) Mechanical bond with concrete due to rigidly connected cross members.
(9) Unbroken continuity of reinforcement, usually across entire width of construction.
(10) Ease and accuracy of installation.
(11) Convenient handling and storage.
(12) Cannot become easily mutilated in shipment.
(13) Either plain or galvanized finish.
(14) Wider range of sizes both in gauge and spacing.

Crimped Open-Mesh Fabric

The same general form of fabric as above, except that certain wires are given V-shaped crimps at definite intervals for "furring purposes."

Range of Manufacture

Aside from its distinct structural adaptability to slab reinforcement, one of the chief advantages of National Steel Fabric results from the fact that practically any desired size of mesh and wire may be obtained. This feature affords great latitude to the designer in his selection of the reinforcement, thereby enabling him to specify practical and economical styles which will meet the particular requirements of each individual structure. The standard styles of fabrics most commonly used are listed on the following page, and it is usually advisable, because of price and to assure prompt delivery, to restrict selection to these sizes although the nearest standard styles may be slightly heavier than actually required.

In cases where the requirements of the work cannot be reasonably met with a standard style and the required quantity is sufficient to justify the use of a special fabric, any desired combination of spacing and gauge may be obtained within the limits tabulated below.

Longitudinal members		Transverse members	
Spacing, in.	Size, in.	Spacing, in.	Size, in.
2, 3, 4, 6, 8, 9, or 12	16 gauge to $\frac{3}{8}$ Diam. .0625 to .375	2, 3, 4, 6, 8, 9, 10, 12, 16 or 18	16 gauge to $\frac{13}{32}$ Diam. .0625 to .468

Furnished in plain or galvanized finish, in rolls or sheets of any desired length, and in widths from 24 to 138 in.

Cross-section of Weld

Illustrates the "fusing" together of longitudinal and transverse members

NATIONAL REINFORCING STANDARD STYLES

Dimensions, areas and weights

Suitable uses	Style	Spacing, in.		Gauge of wire		Sec. area sq. in. per lin. ft.		Weight per 100 sq. ft., lb.
		Long.	Tran.	Long.	Tran.	Long.	Tran.	
Gunite Composition flooring Fireproofing, etc.	AA 1414	2	2	14	14	.030	.030	21
	AA 1212	2	2	12	12	.052	.052	37
	TT 1414	3	3	14	14	.020	.020	14
	TT 1212	3	3	12	12	.035	.035	25
	TT 1010	3	3	10	10	.057	.057	41
	BB 1414	4	4	14	14	.015	.015	11
	BB 1313	4	4	13	13	.020	.020	14
	BB 1212	4	4	12	12	.026	.026	19
	BB 1010	4	4	10	10	.043	.043	31
Gunite Canal lining, etc.	BB 88	4	4	8	8	.062	.062	44
	BB 66	4	4	6	6	.087	.087	62
	BB 44	4	4	4	4	.120	.120	85
Sidewalks Temperature reinforcing Ground floors, etc.	CC 1212	6	6	12	12	.017	.017	13
	CC 1010	6	6	10	10	.029	.029	21
	CC 99	6	6	9	9	.035	.035	25
	CC 88	6	6	8	8	.041	.041	30
	CC 77	6	6	7	7	.049	.049	36
	CC 66	6	6	6	6	.058	.058	42
Slab reinforcing, etc. (One direction only)	AH 711	2	16	7	11	.148	.008	55
	AH 610	2	16	6	10	.174	.011	65
	AH 510	2	16	5	10	.202	.011	75
	AH 49	2	16	4	9	.239	.013	89
	AH 38	2	16	3	8	.280	.015	104
	TH 711	3	16	7	11	.098	.009	38
	TH 610	3	16	6	10	.116	.011	45
	TH 510	3	16	5	10	.135	.011	52
	TH 49	3	16	4	9	.160	.013	61
	TH 38	3	16	3	8	.187	.015	72
	TH 28	3	16	2	8	.217	.015	83
	TH 17	3	16	1	7	.252	.018	96
	TH 06	3	16	0	6	.295	.022	113
	BH 711	4	16	7	11	.074	.008	30
	BH 610	4	16	6	10	.087	.011	35
	BH 510	4	16	5	10	.101	.011	40
	BH 49	4	16	4	9	.120	.013	48
	BH 38	4	16	3	8	.140	.015	56
	BH 28	4	16	2	8	.162	.015	64
Beam wrapping Fireproofing, etc.	BD 1313	4	8	13	13	.020	.010	11
	BD 1214	4	8	12	14	.026	.008	12
	BD 1212	4	8	12	12	.026	.013	14
	BD 1112	4	8	11	12	.034	.013	17
	BD 1012	4	8	10	12	.043	.013	20
Concrete pipe, etc.	BD 912	4	8	9	12	.052	.013	23
	BD 812	4	8	8	12	.062	.013	27
	BD 711	4	8	7	11	.074	.017	33
Slab reinforcing Driveways, etc.	BF 1012	4	12	10	12	.043	.009	19
	BF 912	4	12	9	12	.052	.009	22
	BF 812	4	12	8	12	.062	.009	26
	BF 711	4	12	7	11	.074	.011	31
	BF 610	4	12	6	10	.087	.014	37
	BF 510	4	12	5	10	.101	.014	42
	BF 49	4	12	4	9	.120	.017	50

Mill—Monessen, Pa. (Pittsburgh District). See list of offices on preceding page.

Originating Railroad—P. & L. E. R. R.

Finish—Plain or galvanized as specified (plain fabric will be shipped on all unspecified orders).

Tensile Strength—Wire used in all fabric will develop 70,000 lb. per sq. in.

Widths—(Rolls or sheets). For 4-in. spacing of longitudinal wires, maximum width is 112 in. and is measured from center to center of outside longitudinal wires. For 3-in. and 6-in. spacing of longitudinal wires, maximum width is 60 in., with 138 in. possible in some styles and is measured from center to center of outside longitudinal wires. For widths under 40 in. apply to Pittsburgh office for prices. All transverse wires will have close overhang (½ in. or less) unless otherwise specified.

Lengths—*Rolls*—Stock lengths 100 to 300 ft. depending on style. Customer may specify length of rolls on orders not shipped from stock.

Sheets—No extra for sheets 8 ft. or over. Length of sheets to be specified by customer. For lengths under 8 ft. apply to Pittsburgh office for prices.

Prices—Apply to nearest office.

Note: The "Style" letters and numerals refer respectively to the spacing of wires and to the gauge of wires; for instance, "BD" means 4-in. spacing of longitudinal wires and 8-in. spacing of transverse wires, and "1112" means No. 11 gauge longitudinal wires and No. 12 gauge transverse wires.

TABLES FOR COMPUTING WEIGHT OF NATIONAL REINFORCING STYLES

Weight in lb. per 100 sq. ft. of longitudinal wires

Gauge of wires	Lb. per ft.	Center to center spacing of longitudinal wires, in.						
		2	3	4	5	6	10	12
6–0	.5681	352.22	238.60	181.79	147.71	124.98	79.53	68.17
5–0	.4943	306.47	207.61	158.18	128.52	108.75	69.20	59.32
4–0	.4136	256.43	173.71	132.35	107.54	90.99	57.90	49.63
3–0	.3505	217.31	147.21	112.16	91.13	77.11	49.07	42.06
2–0	.2922	181.16	122.72	93.50	75.97	64.28	40.91	35.06
0	.2506	155.37	105.25	80.19	65.16	55.13	35.08	30.07
1	.2136	132.43	89.71	68.35	55.54	46.99	29.90	25.63
2	.1838	113.96	77.20	58.82	47.79	40.44	25.73	22.06
3	.1584	98.21	66.53	50.69	41.18	34.85	22.18	19.01
4	.1354	83.95	56.87	43.33	35.20	29.79	18.96	16.25
5	.1143	70.87	48.01	36.58	29.72	25.15	16.00	13.72
6	.09832	60.96	41.29	31.46	25.56	21.63	13.76	11.80
7	.08356	51.81	35.10	26.74	21.73	18.38	11.70	10.03
8	.07000	43.40	29.40	22.40	18.20	15.40	9.80	8.40
9	.05866	36.37	24.64	18.77	15.25	12.91	8.21	7.04
10	.04861	30.14	20.42	15.56	12.64	10.69	6.81	5.83
11	.03873	24.01	16.27	12.39	10.07	8.52	5.42	4.65
12	.02969	18.41	12.47	9.50	7.72	6.53	4.16	3.56
13	.02233	13.84	9.38	7.15	5.81	4.91	3.13	2.68
14	.01707	10.58	7.17	5.46	4.44	3.76	2.39	2.05
15	.01385	8.58	5.80	4.43	3.60	3.04	1.94	1.66
16	.01043	6.48	4.38	3.34	2.72	2.30	1.46	1.25

Weight in lb. per 100 sq. ft. of transverse wires

Gauge of wires	Lb. per ft.	Center to center spacing of transverse wires, in.						
		2	3	4	6	8	12	16
0	.2506	155.37	103.58	77.69	51.79	38.84	25.89	19.42
1	.2136	132.43	88.29	66.22	44.14	33.11	22.07	16.55
2	.1838	113.96	75.97	56.98	37.98	28.49	18.99	14.24
3	.1584	98.21	65.47	49.10	32.74	24.55	16.37	12.28
4	.1354	83.95	55.97	41.97	27.98	20.99	13.99	10.49
5	.1143	70.87	47.24	35.43	23.61	17.72	11.81	8.86
6	.09832	60.96	40.64	30.48	20.32	15.24	10.16	7.62
7	.08356	51.81	34.54	25.90	17.27	12.95	8.63	6.48
8	.07000	43.40	28.93	21.70	14.47	10.85	7.23	5.43
9	.05866	36.37	24.25	18.18	12.12	9.09	6.06	4.55
10	.04861	30.14	20.09	15.07	10.05	7.53	5.02	3.77
11	.03873	24.01	16.01	12.01	8.00	6.00	4.00	3.00
12	.02969	18.41	12.27	9.20	6.13	4.60	3.07	2.30
13	.02233	13.84	9.23	6.92	4.61	3.46	2.31	1.73
14	.01707	10.58	7.06	5.29	3.53	2.65	1.76	1.32
15	.01385	8.58	5.70	4.28	2.86	2.15	1.43	1.08
16	.01043	6.48	4.30	3.24	2.15	1.62	1.08	.81

Example: Weight per 100 sq. ft. of 6x12-in. fabric with longitudinal wires No. 0, transverse wires No. 6. Add to weight of longitudinal wire No. 0 spaced 6 in. (55.13 lb.), the weight of transverse wire No. 6 spaced 12 in. (10.16 lb.) making total of 65.29 lb. per 100 sq. ft. Take commercial weight to nearest pound, or 65 lb.

TABLE FOR COMPUTING CROSS-SECTIONAL AREA OF NATIONAL REINFORCING STYLES

Area in square inches per foot of width for various spacing of wires

Wire			Center to center spacing, in.											
Gauge *W&M	Diameter, in.	Area, sq. in.	2	3	4	5	6	7	8	9	10	12	14	16	18
6–0	.4615	.16728	1.004	.669	.502	.402	.335	.287	.251	.223	.201	.167	.143	.125	.112
5–0	.4305	.14556	.874	.582	.437	.349	.291	.250	.218	.194	.175	.146	.125	.109	.097
4–0	.3938	.12180	.731	.487	.365	.292	.244	.209	.183	.162	.146	.122	.104	.091	.081
3–0	.3625	.10321	.619	.413	.310	.248	.206	.177	.155	.138	.124	.103	.088	.077	.069
2–0	.3310	.08605	.516	.344	.258	.207	.172	.148	.129	.115	.103	.086	.074	.065	.057
0	.3065	.07378	.443	.295	.221	.177	.148	.126	.111	.099	.089	.074	.063	.056	.049
1	.2830	.06290	.377	.252	.189	.151	.126	.107	.094	.084	.075	.063	.054	.047	.041
2	.2625	.05411	.325	.217	.162	.130	.108	.093	.081	.072	.065	.054	.047	.041	.036
3	.2437	.04664	.280	.187	.140	.112	.093	.080	.070	.062	.056	.047	.040	.035	.031
4	.2253	.03986	.239	.160	.120	.096	.080	.068	.059	.053	.048	.040	.034	.030	.026
5	.2070	.03365	.202	.135	.101	.081	.067	.058	.050	.045	.040	.034	.029	.025	.022
6	.1920	.02895	.174	.116	.087	.069	.058	.050	.043	.039	.035	.029	.025	.022	.019
7	.1770	.02460	.148	.098	.074	.059	.049	.042	.037	.033	.030	.025	.021	.018	.016
7½	.1695	.02256	.135	.090	.068	.054	.045	.039	.034	.030	.027	.023	.019	.017	.015
8	.1620	.02061	.124	.082	.062	.049	.041	.035	.031	.027	.025	.021	.018	.015	.014
9	.1483	.01727	.104	.069	.052	.041	.035	.029	.026	.023	.021	.017	.015	.013	.011
9½	.1416	.01575	.095	.063	.047	.038	.032	.027	.024	.021	.019	.016	.014	.012	.010
10	.1350	.01431	.086	.057	.043	.034	.029	.025	.021	.019	.017	.014	.012	.011	.009
11	.1205	.01140	.068	.045	.034	.027	.023	.019	.017	.015	.014	.011	.009	.008	.007
11½	.1130	.01002	.060	.040	.030	.024	.020	.017	.015	.013	.012	.010	.009	.007	.006
12	.1055	.00874	.052	.035	.026	.021	.017	.015	.013	.012	.010	.009	.007	.006	.005
12½	.0985	.00762	.046	.030	.023	.018	.015	.013	.011	.010	.009	.007	.007	.006	.005
13	.0915	.00657	.040	.027	.020	.016	.013	.011	.010	.009	.008	.006	.006	.005	.004
14	.0800	.00502	.030	.020	.015	.012	.010	.009	.008	.007	.006	.005	.004	.004	.003
15	.0720	.00401	.024	.016	.012	.010	.008	.007	.006	.005	.005	.004	.004	.003	.003
16	.0625	.00307	.018	.012	.009	.007	.006	.005	.005	.004	.004	.003	.003	.002	.002

*Washburn & Moen.

STEELTEX FLOOR LATH

STEELTEX Floor Lath, a combined reinforcement and form, is designed for light slab concrete or gypsum floors over steel joists. It provides a water-resistant backing, plus a complete network of electrically welded steel wire for reinforcement.

STEELTEX Floor Lath eliminates wood or metal forms and functions in place of them, besides providing reinforcing, automatically embedded and correctly spaced. The heavy corded-backing of STEELTEX Floor Lath maintains proper concrete consistency and minimizes droppings.

Work can proceed in safety, as STEELTEX Floor Lath protects the floors below even while the wet concrete is being poured. Clean-up expense is eliminated and the clean underside of STEELTEX Floor Lath gives a suitable ceiling finish for many types of buildings.

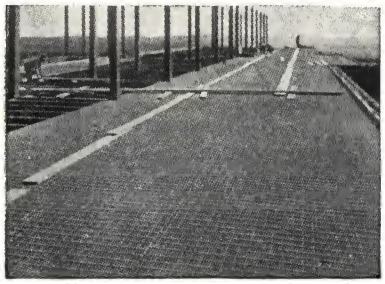
Detail Specification

Before installing STEELTEX Floor Lath, joists shall be rigidly bridged in accordance with Steel Joist Institute Specifications.

STEELTEX Floor Lath, manufactured by the NATIONAL STEEL FABRIC COMPANY, Pittsburgh, Pa. (a 3x4-in. 12-gauge, cold-drawn, electrically welded, galvanized wire fabric, attached to a water-resistant backing, furnished in rolls 4x125 ft.) shall be unrolled across the joists to the desired length from the outer or bearing walls of the building.

STEELTEX Floor Lath shall be fastened every 12 in. along the end joist with special clips or wedges (designed for the type of joist used, and furnished by NATIONAL STEEL FABRIC COMPANY).

STEELTEX is unrolled over the joists and cut to length; it is then attached to an end or anchored joist, drawn taut by the stretching device at the opposite end joist, and fastened by clips or wedges to intermediate joists



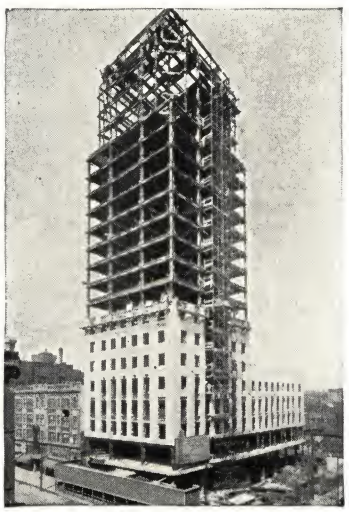
STEELTEX in an unbroken stretch of 212 ft., Douglas County Home, Omaha, Neb.

Concrete is poured directly onto STEELTEX. The heavy corded-backing assures against loss of concrete through dropping and permits slabs of predesigned strength. The galvanized wire mesh is automatically embedded in the slab as the concrete is poured

Time and labor are saved through the use of STEELTEX Floor Lath as it is cut from rolls to any desired length. The correct water cement ratio is maintained as originally proportioned, facilitating proper curing with the result that the concrete develops its full and uniform strength.

Rust and chemical action are retarded by the heavy galvanizing of the steel reinforcing mesh. The necessity of inspection or additional handling of reinforcing rods or separate mesh is eliminated. The quality of the heavy corded-backing affords sound-deadening and makes this lath especially desirable in the construction of floor slabs for hospitals, schools, hotels, office buildings, department stores, apartments, and residences.

The reinforcing element of STEELTEX Floor Lath is composed of 12-gauge, cold-drawn, electrically welded, heavily galvanized steel wire reinforcing mesh. This mesh is attached to a tough corded-backing by means of crimp wires, insuring an automatic embedment of the mesh in the slab from the time the concrete is poured. Reinforcing wires spaced to give maximum reinforcing value to develop full strength of concrete or gypsum slab.

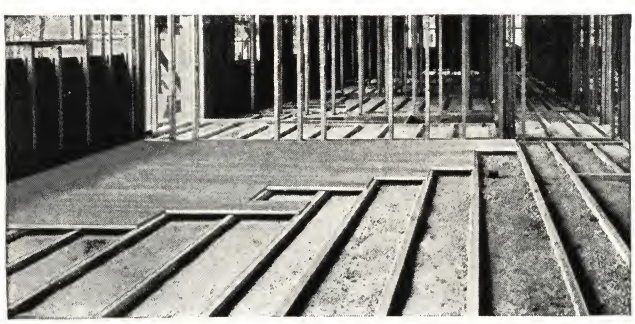


STEELTEX Floor Lath was used throughout in the New Mariner Tower at Milwaukee, shown above during course of construction

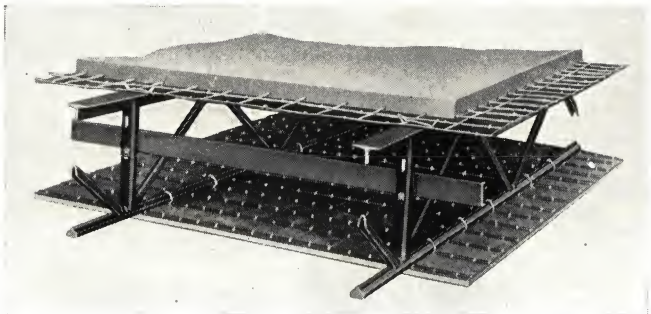
STEELTEX Floor Lath shall be stretched taut longitudinally across the joists by a special stretcher (manufactured by NATIONAL STEEL FABRIC COMPANY), and clipped or wedged securely every 12 in. along the bearing to which the stretcher is attached. STEELTEX Floor Lath shall then be clipped or wedged to each joist every 24 in. on joists spaced 16 in. and over, and one clip or wedge per width of roll for joist spacing under 16 in. Where clips are used, each clip shall face in the opposite direction from the clip adjacent to it.

Where end laps are necessary, STEELTEX Floor Lath shall be lapped at least 1 ft. directly over a joist. Side laps shall be not less than 2 in.

Where finished wood floors are specified, wood sleepers 1⅝x2⅝ in., sized exactly in depth, shall be spaced 16 in. on center, supported at each steel joist with STEELTEX Sheet Metal Sleeper Chair, chair to be attached to floor sleepers in their proper location before putting sleepers in place. STEELTEX Wire Mesh Supports are hung over the wood sleepers and hooked under the reinforcing wires of STEELTEX Floor Lath between joists so as to insure positive alignment of sleepers and embedment of reinforcing.



Finished concrete floor slab—ready for wood flooring which is nailed to wood sleepers



Floor section shows use of an accepted type of rigid bridging for steel joists. Note Ribbed STEELTEX Lath for plaster attached to underside of joists for ceiling

STEELTEX FLOOR LATH—(Continued)

STEELTEX Floor Lath, by virtue of its superior dual features (combined reinforcing and form) is recognized as an outstanding product on which to pour thin concrete and gypsum floors and roofs. Its solid backing eliminates any temporary forming and supports and, together with the reinforcing element, permits the pouring of a slab of predetermined strength.

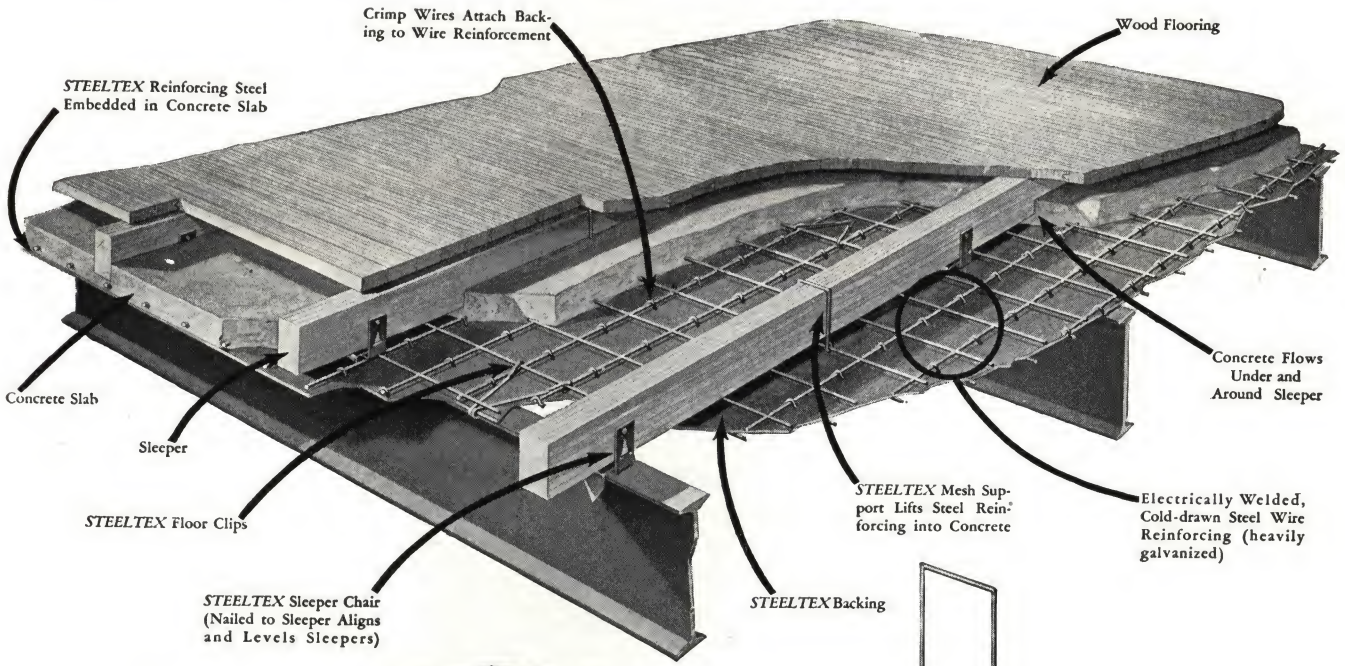
When a wood floor is desired over concrete it is advantageous to use the complete STEELTEX Floor System which comprises (1) STEELTEX Floor Lath, (2) STEELTEX Sleeper Chairs, and (3) STEELTEX Mesh Supports.

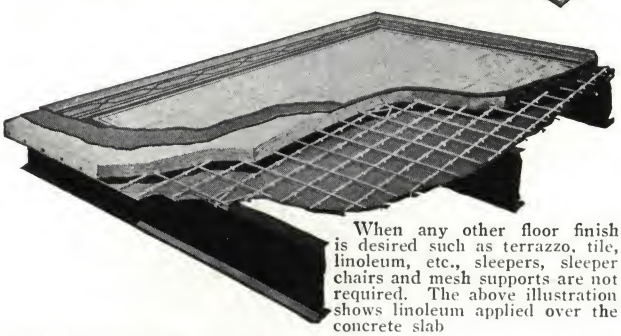
STEELTEX Floor Lath is placed over the light weight steel beams or steel joists, then the sleeper chairs are placed on each steel member **16 in. on center**, the sleepers then properly leveled and aligned by setting them in the sleeper chairs.

The design of the STEELTEX Sleeper Chair assures positive alignment and allows a ¾-in. flow of concrete beneath the sleeper, thus providing a fire stop.

The object of the mesh support (which is fastened around the sleeper and hooked to the steel wire reinforcing of STEELTEX) is to eliminate tendency of sag without necessity of stretching and to lift the steel mesh up into the slab while pouring is taking place.

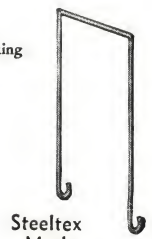
When the concrete has set the sleepers are thoroughly bonded in, ready for the wood flooring to be nailed on, and tendency for squeaky floors is consequently eliminated.





When any other floor finish is desired such as terrazzo, tile, linoleum, etc., sleepers, sleeper chairs and mesh supports are not required. The above illustration shows linoleum applied over the concrete slab

Steeltex Sleeper Chair



STEELTEX Sleeper Chairs are easily and quickly placed in position. The sleeper rests on the chairs and is held and nailed in place so that the concrete flows under and around it. The pointed ends of the STEELTEX Sleeper Chair puncture the STEELTEX backing. When pressed back against the underside of the beam top flange, these ends hold the sleeper chairs securely in place. Standard Chair designed for sleeper 1⅝x2⅝ in. and flange up to 2 in. Other sizes upon request.

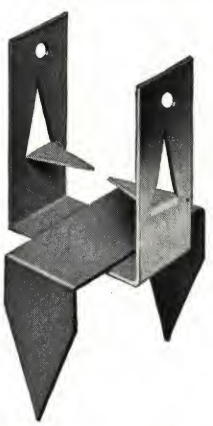


TABLE OF SAFE LOADS FOR CONCRETE FLOOR SLABS USING STEELTEX FOR FLOORS
Values in Table Are Total Safe Loads in Pounds per Sq. Ft. Uniformly Distributed, Including Slab

Span of slab in inches	2-in. slab Weight 25 lb. per sq. ft.	2½-in. slab Weight 31 lb. per sq. ft.	3-in. slab Weight 38 lb. per sq. ft.	3½-in. slab Weight 44 lb. per sq. ft.
18	436	586	736	886
20	353	475	597	718
22	292	392	494	594
24	245	330	415	499
26	209	281	353	426
*28	180	242	305	366
*30	157	211	266	319
*32	139	186	234	281
*34	123	165	207	248
*36	109	146	184	222

*Rigid bridging must be used in accordance with Steel Joist Institute Specifications.

Notes:

1. For partial continuity, i.e. $M = \frac{W1^2}{10}$ take 5/6 of loads in table.

2. For simply supported, i.e. $M = \frac{W1^2}{8}$ take 2/3 of loads in table.

For stress in steel other than 20,000, loads are directly proportional to stress, thus for 16,000, take 16/20 of load in table, for 18,000 take 18/20 of load in table, etc.

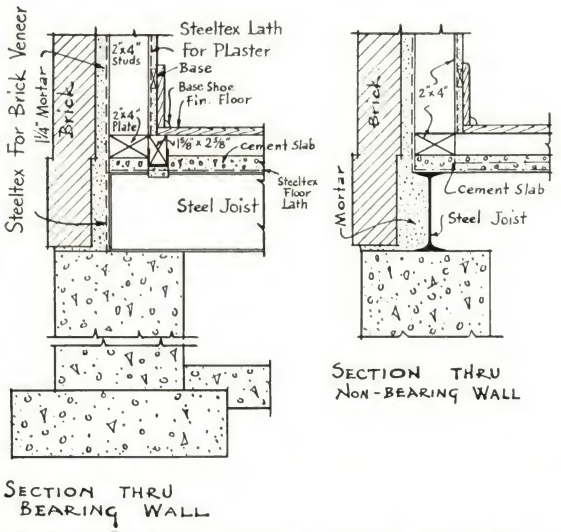
STEELTEX FIRE-SAFE FLOORS

Lightweight, reinforced concrete floors for residences provide permanence, fire-safety and rigidity of construction. The concrete floor slab also serves as a rigid capping for the foundation, making a non-shrinkable deck for the superstructure. This approved floor system eliminates the tendency for settlement in the center of the residence.

The concrete floor slab being non-inflammable, reduces fire hazards by obstructing the passage of flames upward. Lightweight slab concrete floors have been proved extensively in hotels, hospitals and other institutions for structural value and fire-safety.

STEELTEX Floor Lath used as a form and reinforcement for concrete over steel joists or beams, in residences, simply supplants the wood floor and wood joist method. Where a wood finish is desired over concrete, STEELTEX Floor Lath, STEELTEX Sleeper Chairs and sleeper and STEELTEX Mesh Supports are required. Any other floor finish may be laid directly on the concrete.

STEELTEX Floor Lath, a combined reinforcement and form, is an engineered product designed for this class of construction. It has done much to stimulate the increased demand for economical, safe and practical floor systems by virtue of its component units which provide a water-resisting backing, plus a complete network of electrically welded steel wire for reinforcement. The underside of the STEELTEX Floor Slab is clean and suitable for basement ceilings without painting or other finish.



Brick Veneer Wall Construction Details Showing Use of Steeltex Floor Lath for Fire-safe Floors

Steeltex Floor Lath, Used as a Form of Reinforcement for Light Slab or Concrete Floors for Residences, Provides Fire-safe Floors

Above cut-away illustration shows various elements which make up the STEELTEX Floor Lath system, explained in detail on the two preceding pages

UNITED STATES GYPSUM COMPANY

GENERAL OFFICES

300 West Adams Street, CHICAGO, ILL.

For Sales Offices, see Sweet's Manufacturers' Index for U.S.G. Catalogue on Roof, Floor and Partition Products

RED TOP ECONO EXPANDED METAL

Introductory

Econo Expanded Metal is a fabricated diamond mesh steel material of high elasticity. Its diamond shaped meshes range from 3x8 in. down to ½x1¼ in. Engineer and contractor alike find definite advantages in using expanded metal reinforcing for the many forms of concrete slab work of moderate span and load, since the correct amount of reinforcing can be predetermined.

The smaller Econo meshes present an ideal open mesh fabric for the construction of open partitions, window and door guards, elevator enclosures, machine guards, etc., or wherever a rigid open mesh material can be advantageously used.

For Concrete Work

Econo offers marked advantages over any reinforcing system composed of tied or interlaced units. Some of its many advantages are: (1) Ease and rapidity with which it can be properly placed by unskilled workmen and with less supervision. (2) Lightens the designer's responsibility, because the correct amount of steel is determined at the time of manufacture, and cannot be altered by careless or ignorant workmen. (3) Provides a perfect bond, minimizing shocks, concentrated loading, etc., as stresses are evenly distributed over entire area. (4) Large, convenient size sheets, which lie flat without stretching.

The more popular reinforcing uses are for floor and roof slabs of moderate span and load, retaining walls, loading platforms, porch floors, culverts, sea walls, reservoirs, small bridges, tanks, foundations, columns, vaults, fireproofing, beam wrapping, etc.

"Designing Data," our helpful manual covering the use of Econo for reinforced concrete construction, is available to engineers and contractors gratis.

For Open Partitions, Industrial Uses, etc.

Because of its high visibility and great rigidity, Econo is used extensively in practically every industry. It is particularly adaptable for the making of Open Partitions, Window and Door Guards, Machine Guards, etc. Its moderate cost, efficiency, durability and the ease with which it can be bent and formed commend it for this wide range of service.

In the construction of Open Partitions, Econo can be satisfactorily erected with regular angle iron or Red Top (Econo) Partition Bar and Accessories. Neat, lasting Window and Door Guards are easily constructed with the aid of Red Top (Econo) Frame Bar and Accessories. The Bar furnishes a continuous edging to which hinges and clips can be attached. Form-fitting, space-saving Machine (belt and gear) Guards are a present-day necessity and are within reach of all plant owners. They can be readily fabricated with Econo Mesh and angle iron.

Among its many present uses in the various industries are: Skylight guards, conveyor enclosures, elevator shaft and cage enclosures, fire door guards, mill trucks, trays and baskets, open shelving, ventilating fan enclosures, refuse burners, live stock pens, filter screens, dehydrators, truck body enclosures, stairway enclosures, brake shoe binder.

Practically every one of the special uses for which Econo can be advantageously employed can be satisfactorily designed and fabricated by capable shop mechanics or plant maintenance men.

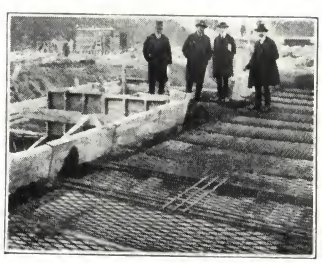
The United States Gypsum Company does not manufacture partitions, guards, etc. Its interest is confined to the distribution of the necessary materials for their construction, together with any advisory service that can be rendered. Names of reliable fabricators will also be furnished to those who prefer to have their safety and industrial devices built for them. Interesting descriptive literature on the many industrial uses for Econo is also available.

STOCK SIZES AND WEIGHTS OF ECONO EXPANDED METAL

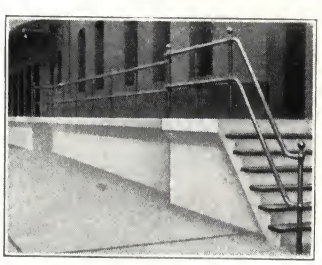
Style number	Size of mesh, in.	U. S. standard gauge, No.	Weight per sq. ft., lbs.	Sectional area per foot width, sq. in.	Standard size of sheets: Width, ft. in.	Standard size of sheets: Length, ft.
Meshes for Reinforcing Concrete						
06–3	3 x8	16	.20	.06	6 0	8 and 12
08–3	3 x8	16	.27	.08	6 0	8 and 12
10–3	3 x8	13	.34	.10	4 0	8, 10, and 12
125–3	3 x8	13	.42	.125	5 6	8, 10, and 12
15–3	3 x8	10	.51	.15	7 0	8, 10, and 12
176–3	3 x8	10	.60	.176	6 0	8, 10, and 12
20–3	3 x8	10	.68	.20	5 6	8, 10, and 12
25–3	3 x8	10	.85	.25	4 3	8, 10, and 12
30–3	3 x8	10	1.02	.30	7 0	8, 10, and 12
35–3	3 x8	10	1.19	.35	6 0	8, 10, and 12
40–3	3 x8	7	1.36	.40	7 0	8, 10, and 12
45–3	3 x8	7	1.53	.45	6 3	8, 10, and 12
50–3	3 x8	7	1.70	.50	5 9	8, 10, and 12
54–3	3 x8	7	1.83	.54	5 6	8, 10, and 12
60–3	3 x8	7	2.04	.60	4 9	8, 10, and 12
65–3	3 x8	7	2.19	.65	4 3	8, 10, and 12
10–2¼	2¼ x6	16	.34	.10	5 0	8 and 12
15–2¼	2¼ x6	13	.51	.15	4 9	8, 10, and 12
Special Meshes for Open Partitions, Industrial Uses, etc.						
06–1½	1½ x3	18	.20	.06	2-9 and 4-0	8 only
12–1½	1½ x3	16	.40	.12	4-3 and 5-8	8 and 12
* 18–1½	1½ x3	13	.60	.18	4 0	8, 10, and 12
375–1½	1½ x3	9	1.28	.375	6 0	8 only
15–¾	¾ x2½	16	.51	.15	7 0	8 and 12
* 24–¾	¾ x2½	13	.80	.24	4 and 6	8, 10, and 12
53–¾	¾ x2½	9	1.80	.53	4 6	8 only
* 20–½	½ x1¼	18	.68	.20	4 0	8 only
24–½	½ x1¼	16	.82	.24	4 and 8	8 only

*These styles bear the "Tested and Inspected" label of the Underwriters' Laboratories.

CONCRETE REINFORCING USES

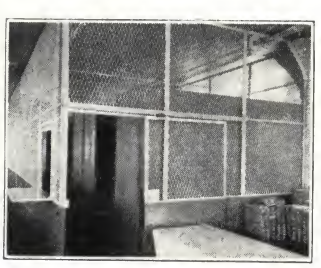


Roads and Sidewalks

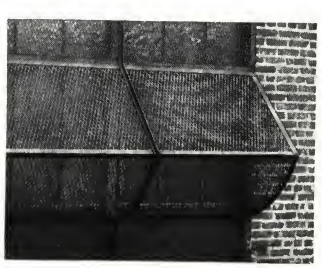


Loading Platforms

INDUSTRIAL USES



Open Partitions



Window Guards

RAIL STEEL BAR ASSOCIATION

228 North La Salle Street
CHICAGO, ILL.

ASSOCIATED MILLS

BUFFALO STEEL COMPANY, Tonawanda, N. Y.
BURLINGTON STEEL COMPANY, LTD., Hamilton, Ont., Canada
CALUMET STEEL CO., Chicago, Ill.
CANADIAN TUBE & STEEL PRODUCTS, LTD., Montreal, Que., Canada
CONNORS STEEL COMPANY, Birmingham, Ala.
FRANKLIN STEEL WORKS, Franklin, Pa.
LACLEDE STEEL COMPANY, St. Louis, Mo.
MISSOURI ROLLING MILL CORPORATION, St. Louis, Mo.
THE POLLAK STEEL COMPANY, Cincinnati, Ohio
THE WEST VIRGINIA RAIL COMPANY, Huntington, W. Va.

PRODUCERS OF ASSOCIATION MARKED RAIL STEEL REINFORCING BARS

THE SYMBOL

Product

RAIL STEEL REINFORCING BARS are one standard grade (A.S.T.M. Specification A16-14) and are the product of standardized manufacture throughout the associated industry. They are known commercially and technically by the name of RAIL STEEL and are not to be confused with bars known as "rerolled" that have no standard specification for quality or manufacture, nor are they to be confused with grades termed "rail steel equivalent," "rail steel quality" or similar substitutes.

Marking and Certification

Deformed rail steel reinforcing bars, produced by members of the RAIL STEEL BAR ASSOCIATION, are identified by a mark (the rail symbol) rolled on each bar—a permanent mark that cannot be erased or destroyed. This mark is an assurance to the engineer and architect that the bar was rolled in accordance with requirements of this associated industry to meet the standards for rail steel concrete reinforcement bars.

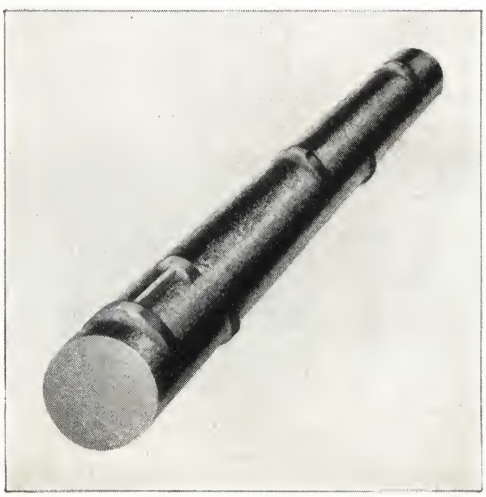
The Rail Steel Industry

The RAIL STEEL BAR ASSOCIATION is a manufacturers' organization of international scope formed twenty years ago for the purpose of co-operative research in production methods. This research and exchange of information have developed a standard of uniform quality throughout the associated industry. As a member of other national technical societies and engineering commissions this association has given extensive co-operation to the development of standards for better reinforced concrete construction.

"The Story of Rail Steel" is a three-reel industrial film showing a modern steel mill, the manufacture of rails, the rolling and fabrication of rail steel bars and the use of these bars in reinforced concrete construction. This film is furnished without charge on application to the educational department of the association.

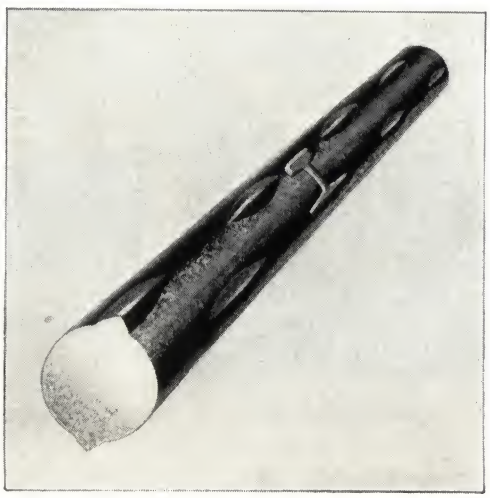
Handbooks and Literature

Handbooks, technical bulletins and other detailed information will be mailed by the association office on request.



Two Types of Deformed Rail Steel Reinforcing Bars

Illustrating the use of the Association symbol as a quality label to identify bars rolled by an associated mill.



SPECIFICATION AND DESIGN DATA

Recommended Architects' Specification

Reinforcement—All bars for concrete reinforcement shall conform in quality to the requirements of standards of the American Society for Testing Materials for Rail Steel Concrete Reinforcement Bars (Serial Designation A16-14) as rolled and marked by a member mill of the RAIL STEEL BAR ASSOCIATION or for Billet Steel Concrete Reinforcement Bars (Serial Designation A15-14). All bending and fabrication shall be done at the mill or warehouse of the bar manufacturer or on suitable fabricating equipment in accordance with established standards of the industry.

Standard Sizes and Areas

Rail Steel reinforcing bars are produced in eleven standard sizes in accordance with the Department of Commerce Simplified Practice Recommendation R-26-30 as follows:

Cross-sectional areas, sq. in.	Equivalent nominal sizes (rounds and squares), in.
.05	¼ round
.11	⅜ round
.20	½ round
.25	½ square
.31	⅝ round
.44	¾ round
.60	⅞ round
.79	1 round
1.00	1 square
1.27	1⅛ square
1.56	1¼ square

The Department of Commerce has also adopted a simplified schedule of standard bar sizes, pitches and diameters of spirals for varying percentages of reinforcement. This is known as Simplified Practice Recommendation No. 53 and may be obtained from the Superintendent of Documents or from this association. It is sometimes incorrectly believed that there exists a Department of Commerce Commercial standard for one grade of reinforcement. Such a standard was at one time published and circulated before final adoption but was subsequently rejected and recalled.

Standard Specification Requirements

It should be understood that Rail Steel is one of four standard grades of concrete reinforcement bars, namely: Rail Steel, structural grade billet, intermediate grade billet and hard grade billet. Quality requirements for each of these four grades will be found in the standards of four specification-making bodies. For a complete quality specification covering any one or more of these grades, it is only necessary to refer to one of the following standards:

(1) American Society for Testing Materials.
(2) Federal Specification 350a.
(3) Association of American Steel Manufacturers.
(4) Canadian Engineering Standards Association.

These standards are substantially equivalent in their requirements and a choice is therefore optional with the specification writer. The first two named are most widely used. As illustrated by the recommendation at the top of this page, the most efficient architects' specification is one which refers to one of these established standards and thereby automatically includes all requirements for source, minimum properties and inspection. Detailed requirements in architects' specifications are unnecessary and are oftentimes inaccurate and inefficient.

Minimum physical properties for Rail Steel required by these standard specifications are as follows:

TENSILE PROPERTIES

	Plain	Deformed
Tensile strength (lb. per sq. in.)	80,000	80,000
Yield point (lb. per sq. in.)	50,000	50,000
Elongation in 8 in. (per cent)	1,200,000 ÷ Tens. Str.	1,000,000 ÷ Tens. Str.

BENDING PROPERTIES

	Plain	Deformed
Bars under ¾ in.	180° bend, $d = 3t$	180° bend, $d = 4t$
Bars ¾ in. and over	90° bend, $d = 3t$	90° bend, $d = 4t$

Note: d—diameter or pin about which specimen is bent.
t—thickness or diameter of the specimen.

The standards also provide for inspection procedure, variations of weight, source of material and other qualifications.

Rail Steel Properties

Two fundamental properties—high strength and toughness—distinguish Rail Steel bars. It is a well-known metallurgical principle that "working" of steel—by rolling—refines the grain and produces what may be described as a more closely knit structure. A Rail Steel bar, in addition to the working that has already been given its raw material, receives the additional rolling necessary to reduce the slit-rail billets to bars.

The average tensile strength of Rail Steel reinforcing bars is 100,000 lbs. per sq. in. The average elastic limit is 64,000 lbs. per sq. in. which provides, in the design of reinforced concrete, a safety factor of 3.20 based on the unit working stress of 20,000 lbs. per sq. in. that is customarily permitted for Rail Steel bars. Balanced with this high elastic limit, the toughness or ductility of Rail Steel bars permits all fabrication and a maximum of resistance to all deformation that may be caused by structural stress.

Uniformity characteristics of Rail Steel show extremely low variation in any one lot of material. Mill tests made in 1931 under direction of the National Research Council show an average deviation of 2.9% for yield at point strengths and 3.6% for tensile strengths. These values demonstrate the high development of controlled manufacture in the associated Rail Steel Mills.

Design Considerations

Modern design standards favor high elastic limit and common practice assigns to Rail Steel bars the maximum allowable unit working stress of 20,000 lbs. in tension. This practice has a sound basis in the fact that the average yield point of this material (64,000 lbs.) provides a factor of safety in excess of three times the design value. Intermediate grade is quite generally used at the same working stress.

Tests and Research

Rail Steel bars have a background of tests and research that is conclusive evidence of the structural suitability of this material as well as of certain advantages to be gained by its use. These tests include many conducted under direction of the National Research Council, Bureau of Standards, American Concrete Institute, University of Illinois, Lehigh University, Illinois Highway Laboratory and other similar technical bodies as well as by the research organization of the industry itself.

These tests, both on bars alone and on structural units of reinforced concrete in which they have been embedded, have demonstrated and recommended as a consideration of importance in design, the high resistance of Rail Steel bars to impact or other similarly unusual loads that may be imposed on a concrete structure.

In the tests made in 1917 on the Western Newspaper Union Building at Chicago (University of Illinois Bulletin 106), the Rail Steel reinforcement not only withstood the enormous static test loads applied but, in the subsequent wrecking of that structure, the bars resisted the impact of wrecking apparatus and by necessity were eventually removed with an oxy-acetylene flame.

In a report of the Department of Commerce Building Code Committee (Bulletin BH-9) definite mention as a design consideration is made of the value of high tensile strength reinforcement, such as rail steel, in resisting crack formation in reinforced concrete structures. Recognition of rail steel as a standard grade of concrete reinforcement is emphasized in this report. Conclusions were based on experience of the committee, together with a consideration of tests made by the U. S. Bureau of Standards and other authoritative bodies.

In the American Concrete Institute column investigation, Rail Steel bars have shown maximum efficiency as reinforcement by reason of their high elastic limit. These tests included a study of columns having varying percentages of vertical reinforcement and using grades of steel of varying elastic limits. Details may be found in the American Concrete Institute Journal.

REPUBLIC FIREPROOFING COMPANY, INC.

Slagblok Fireproof Floor Construction

GENERAL OFFICES
31 Union Square
NEW YORK, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

Product

REPUBLIC SLAGBLOK FLOOR SYSTEM, consisting of Slagblok Units and Steel Bar Reinforcement for stone concrete fireproof floor construction.

Experience

We have furnished the material and service for the floor construction of more than 1500 buildings.

REPUBLIC SLAGBLOK FLOOR SYSTEM

System

The Republic Slagblok Floor System is a combination of precast slag concrete units surrounded by concrete ribs (poured at the job) in which the reinforcement is placed. It is used for both floor and roof slabs.

Each unit is composed of two blocks (see detail on following page) which are placed on the forms with the open ends abutting each other, thus making the horizontal dimensions of each unit 16x16 inches.

The ribs are usually 4 ins. wide and are run parallel to the supports in both directions 20 inches on centers.

The detail shows the simplest form of slab construction where the concrete ribs are poured flush with the top of the blocks.

It is frequently necessary to increase the thickness of the slab construction by providing a layer of concrete, poured with the ribs, over the entire slab surface. The thickness of this layer will depend on the factors entering into the design.

With a monolithic concrete layer over the Slagbloks the surface may be troweled to a smooth finish ready to receive carpets, linoleum or other finished wearing surface.

Design

The Slagbloks are made of slag concrete under a special patented process which results in high compressive strength and at the same time gives the Slagbloks a perfect bonding quality with concrete poured against them. For this reason the net area of the blocks is considered as a structural part of the slab in the design. The slabs are designed both as "one-way" and "two-way" construction—the two-way construction being the more economical under ordinary conditions.

Complete design information furnished on request.

Bond Tests

The excellent bonding qualities of the blocks have been proven by tests made by the Haller Testing Laboratories, Plainfield, N. J., and the E. L. Conwell Testing Laboratories, Philadelphia, Pa. Bond stresses as high as 850 lbs. were reached and in no case did failure occur at the bonding surfaces of the blocks.

Complete data regarding these tests will be furnished on request.

Slab Tests

Three slab tests have been made by the Columbia Testing Laboratories and the Pittsburgh Testing Laboratories.

These tests prove conclusively the combined action of blocks and concrete besides furnishing data for economical design of two-way slabs.

Copies of test reports will be furnished on request.

Approval

Slagblok construction has been approved by practically all of the major cities in the eastern part of the United States: i.e., New York, Boston, Washington, D. C., New Haven, Hartford, Albany, Syracuse, Rochester, etc.

Advantages

Flat Ceiling—This is obtained by locating beams at partitions. As a large variation in panel sizes may be handled economically with the Slagblok System it adapts itself for any usual room size—from rooms in hotels and apartment houses to large classrooms in school buildings.

Saving in Story Height—As all material entering into the construction of Slagblok floors is doing actual work, the system will give as thin a floor as can be used for a certain span. Compared with most other types of construction a greater ceiling height or decreased story height is obtained. In the latter case a saving in masonry is effected.

For a tall building it is often possible to add another story in the same building height.

Saving in Plaster—As Slagblok construction produces flat ceilings between beams, the plaster may be applied directly to the slab. The excellent plaster bond afforded by Slagblok obviates the necessity of any bond preparations.

Compared with short span slab and beam construction there is a substantial saving in plaster due to less areas and fewer arrises to plaster.

Compared with ribbed slab construction the saving in plaster is due to the omission of metal lath and thinner plaster.

A two-coat plaster job will give satisfactory results on Slagblok ceilings. As the material in the Slagblok is of the same nature and color as the concrete in the ribs, the danger of discoloration of the finished ceiling is reduced to a minimum, and entirely avoided wherever the standard requirements for a good plaster job are followed.

Pipes, Conduits, Etc. in Slabs—The System is particularly well adapted for monolithic finish as conduits, pipes and underfloor ducts can be easily installed in the slab construction.

The concrete ribs running in both directions give the system great flexibility for the mechanical layout.

Shallower blocks may also be used for part of the slab to provide additional space for mechanical work if required.

Rigidity—The reinforcement in both directions gives the System increased rigidity for transmission of horizontal forces, such as wind stresses. The two-way load distribution also results in greater capacity for concentrated loads.

Equal Resistance to Negative and Positive Moments—This is obtained through the use of equal wall thickness for top and bottom of blocks, and is a distinctive feature of the System.

No Uncertainty as to Concrete Quantities—As all units are completely closed the quantity of concrete required is independent of the consistency of the concrete.

Cost

Installed cost per square foot will vary with spans, loads, etc., but compares very favorably with other types of fireproof floor construction.

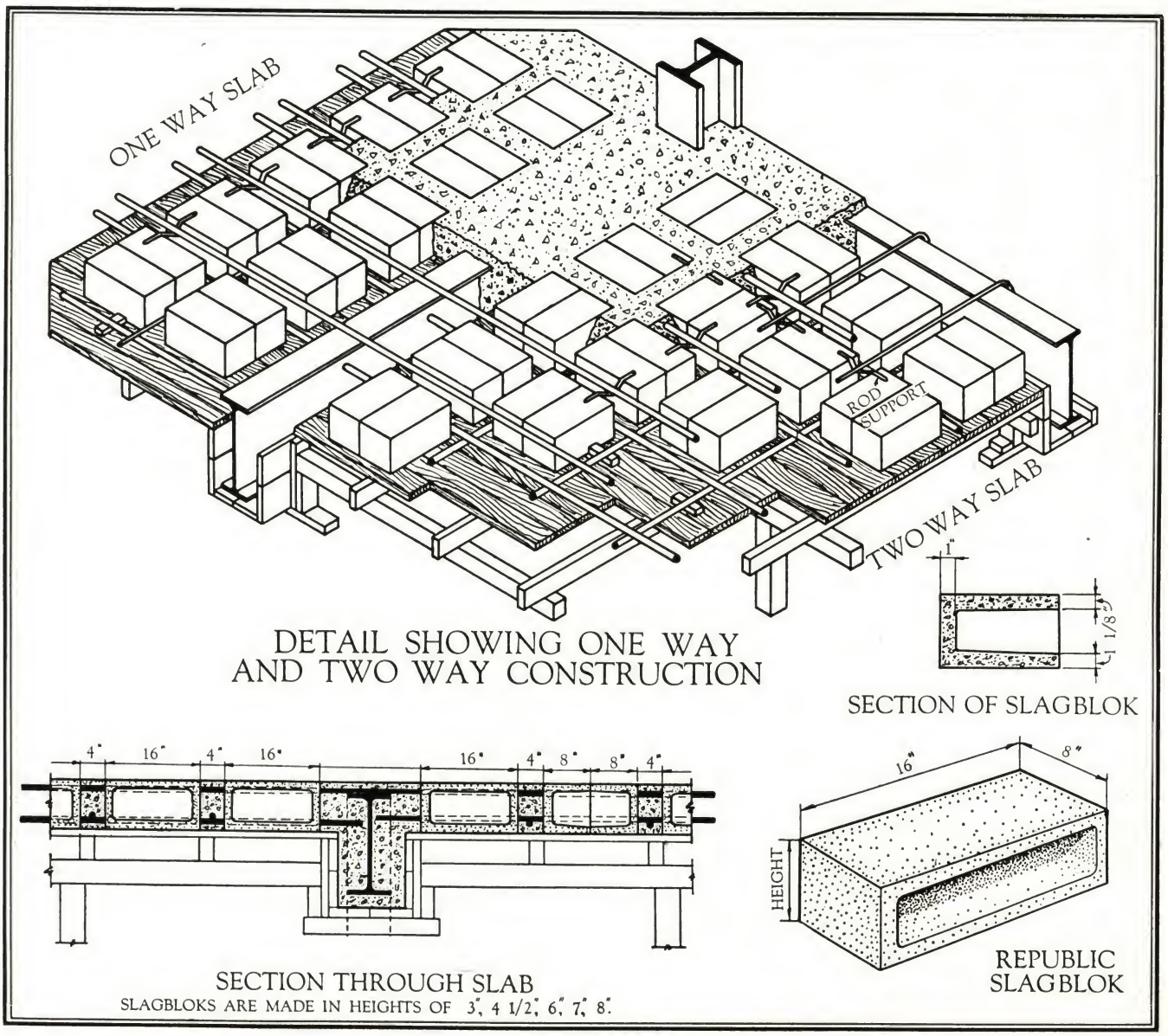
Service of the Company

The Republic Fireproofing Company, Inc. does not contract for installation. The Company sells the Slagbloks and the reinforcing bars for slabs, beams and columns and provides, without extra charge, all working drawings in connection therewith, and also furnishes inspection service in the field as may be deemed necessary for mutual protection of all parties concerned.

Our Engineering Staff will advise at any time regarding the use of the Slagblok System, and will furnish estimates on prospective operations.

References

Building	Architect
Waldorf-Astoria Hotel, New York, N. Y.	Schultze & Weaver
City Bank-Farmers Trust Co. Bldg., New York, N. Y.	Cross & Cross
Western Union Office Bldg., Boston, Mass.	Stone & Webster
American Security & Trust Co. Bldg., Washington, D. C.	York & Sawyer
New Haven Hospital, New Haven, Conn.	Henry C. Pelton
Adelphi College, Garden City, N. Y.	McKim, Mead & White
Hersh Store and Office Bldg., Elizabeth, N. J.	Myers & Shanley
One Beekman Place Apts., New York, N. Y.	Sloan & Robertson



DETAIL SHOWING ONE WAY AND TWO WAY CONSTRUCTION

SECTION OF SLAGBLOK

SECTION THROUGH SLAB

SLAGBLOKS ARE MADE IN HEIGHTS OF 3", 4 1/2", 6", 7", 8".

REPUBLIC SLAGBLOK

ESTABLISHED 1842

JOSEPH T. RYERSON & SON INC.

Reinforcing Steel, Metal Lath, Caisson Rings and Steel Products

GENERAL OFFICES
CHICAGO, ILL.

PLANTS

BOSTON, MASS.	CHICAGO, ILL.	CLEVELAND, OHIO	JERSEY CITY, N. J.	PHILADELPHIA, PA.
BUFFALO, N. Y.	CINCINNATI, OHIO	DETROIT, MICH.	MILWAUKEE, WIS.	ST. LOUIS, MO.

REPRESENTATIVES IN

DALLAS, TEX.	HOUSTON, TEX.	MINNEAPOLIS, MINN.	NEWARK, N. J.	SAN FRANCISCO, CAL.
DENVER, COLO.	LOS ANGELES, CAL.	NEW YORK, N. Y.	ROCK ISLAND, ILL.	TULSA, OKLA.

Products

CONCRETE REINFORCING MATERIALS, including: Plain and Deformed Reinforcing Bars, Triangle Wire Mesh, Electrically Welded Rectangular Mesh, Column Spirals, Continuous Wire Mesh Stirrups, Beam Wrapping, Fabricated Units, Road Center Strips, Wire Rods, Wire, Furring Channels and Angles; Miscellaneous REINFORCING ACCESSORIES, such as Bar Chairs, Bar Spacers, Bar Ties, Inserts, etc.

EXPANDED METAL PRODUCTS, including: Ryex Industrial Mesh, Ryex Expanded Metal Reinforcing, Metal Lath, Corner Beads, Metal Picture Moulding, Base Screed, Base Grounds, Rib Lath.

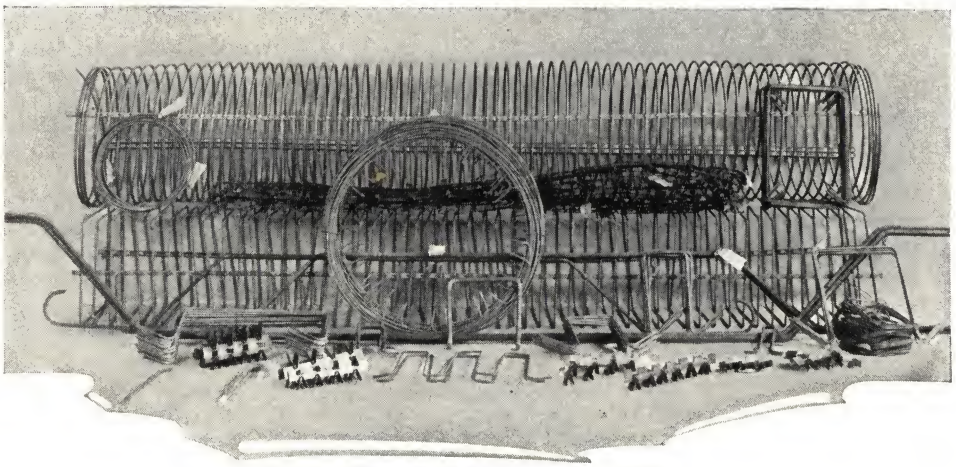
SAFETY TREADS and PLATES, including: Mason Safety Treads, Firmtread Floor Plates and Treads, Sheet Steel Subtreads and Risers.

IRON and STEEL PRODUCTS, including: Bars, Bar Shapes, Structurals, Rails, Plates, Sheets, Boiler Tubes and Fittings, Shafting, Chain, Rivets, Bolts, Nails, Refined Iron, Alloy Steel, Tool Steel, etc.

CAISSON RINGS.

SMALL TOOLS.

Also Steel Sheet Piling, Steel Shoring.



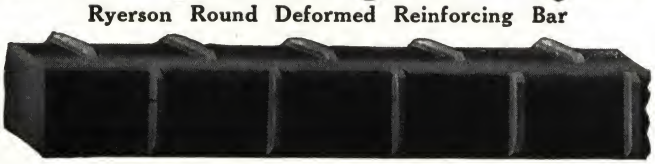
A Few Ryerson Reinforcing Products

Bars

At our ten warehouse plants located throughout the country, we carry a complete stock of plain and deformed bars, both round and square. These bars are rolled from new billet stock, conforming to standard specifications of the American Society for Testing Materials, Serial Designation A-15-30. Bars, of intermediate and hard grade, are carried in stock in lengths up to 60 ft.

Round deformed bars are carried in the following diameters: ⅜, ½, ⅝, ¾, ⅞ and 1 in. Square deformed bars are carried in the following sizes: ½, 1, 1⅛ and 1¼ in.

Ryerson Round Deformed Reinforcing Bar



Ryerson Square Deformed Reinforcing Bar

Bending and Fabricating

We have the most up-to-date machinery and other equipment for fabricating, and can bend bars to any shape required for beam, joist and slab rods, stirrups, ties, hoops, etc.

Spirals and Continuous Hooping

On our spiral machines we manufacture spirals for round columns, continuous uniform hooping for square and rectangular columns, and continuous single unit stirrups for beams and girders. Spirals are made from new first quality wire rod in sizes from ¼ to ⅝ in., inclusive.

Both round and square hooping can be collapsed for shipment.

Triangle Wire Mesh Reinforcement

We always carry on hand a large stock of triangle wire mesh for slab reinforcement. This material is carried in rolls in standard gauges and sizes of mesh and can be shipped at once. Electrically welded rectangular mesh is also in stock, or can be shipped direct from factory.

Road Strips and Highway Construction Material

We furnish completely fabricated material for reinforcing roads, culverts and bridges, including metal road strips and all necessary reinforcing fabrics, supports and spacers.

Accessories

In addition to bars and spirals, we carry complete stocks of all accessories such as beam, joist and slab bar spacers, bar and screed chairs, bar ties, wire, etc., also wire fabric and expanded metal for reinforcing roadways and for floor slabs, concrete pipe, etc., angles, channels and pencil rods for suspended ceilings, furring and similar purposes.

Ryex Expanded Metal Industrial Mesh

This material, used for window and skylight guards, tool room and other partitions, railings, lockers, machine guards, etc., is carried in stock in the following sizes:

Mesh, in.	Gauge	Width, ft.	Width, in.	Length, ft.	Length, in.
½	18	6	0	8	8
		4	0	8	8
¾	16	6	6	8	0
¾	13	6	0	8	0
		4	0	8	0
¾	10	4	0	8	0
¾	9	4	0	8	0
1½	13	8	0	8	0
		4	0	8	0
1½	10	6	0	8	0
		4	0	8	0
1½	9	6	0	8	0

By a special new process these sheets are now furnished without any burrs or sharp edges.

Ryex Expanded Metal Reinforcing

We are prepared to furnish from stock, expanded metal in meshes varying from .075 sq. in. per ft. of width to .60 sq. in. Length of sheets 8 ft. and 12 ft. Sheets 16 ft. long can be furnished from factory by special arrangement.

Metal Lath, Plastering Channels, etc.

We are in a position to furnish all the steel requirements for plastering. This service includes expanded metal lath, rib lath, corner bead, bullnose corner bead, picture mould, curved point base screed, base grounds, hot rolled channels, cold formed channels, pencil rods, angles, tees, flats, wire, etc.

¾-in. Rib Lath
Deep ribs and strong mesh eliminate the need of wood forms

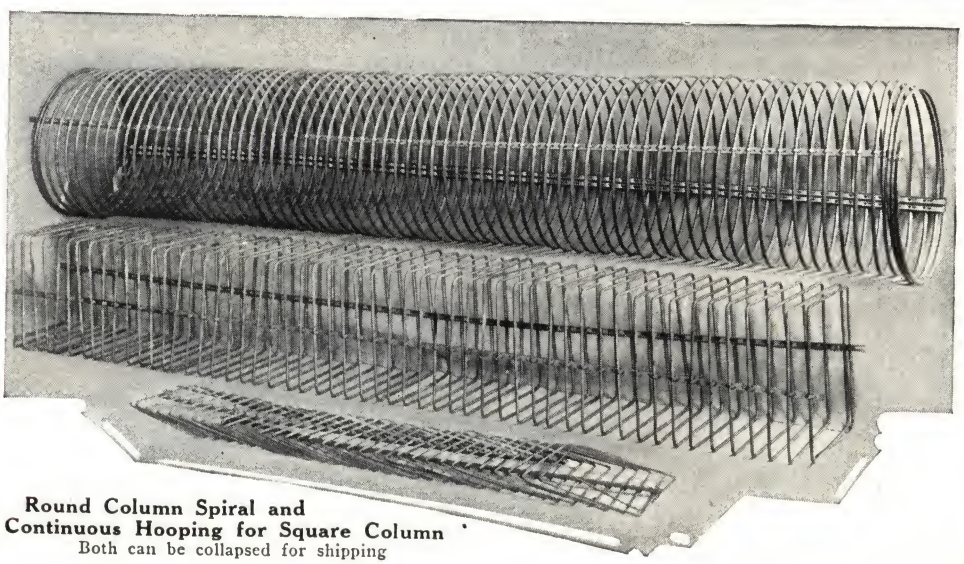
Immediate deliveries from our warehouse stocks or direct from factories in Chicago and the East.

Caisson Rings

We manufacture caisson rings rolled from flat bars with lugs formed by bending bar at right angles and punched for bolts.

We also make rings from standard channels with flanges of channels turned in. These rings have lugs made by welding bars at right angles to ends of channels. All welds are tested with a heavy sledge.

Channel rings are lighter, but more rigid than equivalent rings made from flat bars.

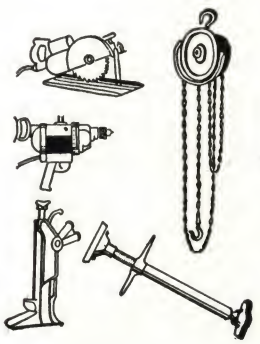


Round Column Spiral and Continuous Hooping for Square Column
Both can be collapsed for shipping

Shipping Bay in a Ryerson Plant
Reinforcing materials ready for loading

Small Tools

Prompt service on all the hundred and one small tools needed for construction work is another feature of our complete service to builders. Every tool is backed by the Ryerson Guarantee. If you haven't our tool catalogue and price list, write and we will mail them at once.



Portable electric saws, electric drills, trench braces, jacks, hoists, furnaces, reamers, rivet forges, riveting hammers, electric hammers, clamps, grinders, punches, shears, drift pins, etc., are a few of the items available.

Delivery

Our large stocks of bars and other material enable us to make exceptionally quick delivery on reinforcing material—all cut, bent, bundled and tagged ready for the forms. By use of special aluminum tags with stamped, raised letters and numerals, the identification marks showing the location in the building of each bundle can not be obliterated. These tags are not subject to rust. Specially designed 40-ft. trailers for tractors, with steel adjustable skids, enable us to haul the longest material and unload with a minimum of effort and without distortion or damage to the material. All of our Steel-Service Plants have private switch tracks connecting with trunk line railroads, affording exceptional service on freight shipments.

This Tag Identifies Each Piece

Ryerson Steel-Service

In addition to reinforcing materials we carry all kinds of steel products at each of our plants, thus giving the contractor a convenient source upon which to draw for such other steel as he may require on a job.

Bars	Babbitt
Shapes	Wire
Structurals	Turnbuckles
Rails	Corrugated roofing and siding
Shafting	Stair treads
Plates	Firmtread plates
Sheets	Boiler tubes and fittings
Rivets	Refined iron, etc.
Bolts	
Chain	

TRUSCON STEEL COMPANY

Manufacturers of a Complete Line of Permanent Building Products Including Concrete Reinforcements and Forms

YOUNGSTOWN, OHIO

Offices and Warehouses in Principal Cities—For list, see our pages on Steel Windows

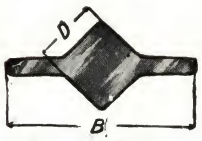
Products

KAHN TRUSSED BARS; RIB BARS; WELDED STEEL FABRIC; COLLAPSIBLE COLUMN HOOPING; RIBBED FLORETYLE; LOCKTYLE; SLOTTED INSERTS; ADJUSTABLE INSERTS; TAPPED INSERTS; CURB BARS; CHANNELPLATE FLOOR SYSTEM; TEEGRID BRIDGE FLOORS.

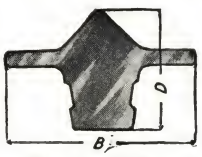
For other Truscon Products, see pages in this edition on Steel Joists, Steeldeck Roofs, Standardized Buildings and Structural Steel, Steel Doors, Steel Windows, Metal Laths and Accessories, Safety-Tread Steel, Ferroclad Insulation, as listed in Manufacturers' Index.

Kahn Trussed Bars

The Kahn Trussed Bar for reinforcing concrete consists of a main horizontal bar and rigidly connected diagonal shear members. The cross-section of the bar has two horizontal flanges projecting at opposite sides. These flanges are sheared up at intervals to form the rigidly connected diagonals, making a unit of main bar and shear members. Kahn Trussed Bars save steel, save labor of installing many loose separate bars, because shear members and main bar are handled as one piece, safeguard the structure, and make beams 12% to 30% stronger than where loose stirrups are used.



Section Kahn Trussed Bar



Section Kahn Trussed Bar

D x B, in.	Weight per linear foot, lb.	Area, sq. in.
½x1½	1.4	0.41
¾x2 3/16	2.7	0.79
1½x2¼	4.8	1.41
1¾x2¾	6.8	2.00
2 x3½	10.2	3.00

Rib Bars

The Rib Bar for reinforcing concrete is a special rolled section with a series of cross ribs designed to secure maximum grip on the concrete. Rib Bars are widely used for reinforcement of concrete slabs, also as bent bars in beams, vertical bars in columns and for reinforcement in domes, tanks, abutments, walls and concrete subject to tension and compression and to temperature expansion and shrinkage stresses.

Truscon Adjustable Inserts

Truscon Adjustable Inserts are made of pressed steel, and have the same simple method of application to concrete and adjustment for bolts as the slotted inserts, but without their wide range of adjustability. Made to carry ½, ⅝ and ¾-in. bolts.

Truscon Tapped Inserts

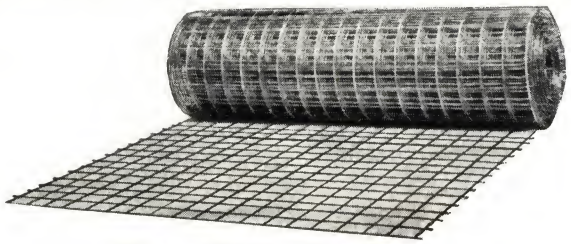
Truscon Tapped Inserts are made from pressed steel of highest quality, and furnished tapped for ½, ⅝ and ¾-in. bolts. Particularly adapted for work where arrangement has been determined before start of construction. Where required, this type of insert can be furnished tapped for ⅜ or ½-in. pipes as well as for ⅜-in. standard bolts.

Truscon Slotted Inserts

Truscon Slotted Inserts are attached to the forms and are completely embedded in the concrete construction. Only the narrow slot flush with the concrete is seen in the completed work. The bolt can be moved along this slot to any location, allowing wide variation in position. Truscon Slotted Inserts are used with equal success in ceilings, slabs, beams or columns. The anchors are integral with the insert and occur every 6 in. on each side.

Welded Steel Fabric

An ideal reinforcement for concrete pavements, roadways, floors and similar work. All members are accurately spaced and rigidly welded in place so that the reinforcement can be placed with the least amount of supervision and with absolute assurance that the steel will be exactly where specified in the concrete. A complete range of sizes for main and secondary members, with main members spaced either 4 or 6 in. apart, provides exactly the desired sectional area. The fabric may be obtained either in flat sheets or in rolls having 18-in. cores.



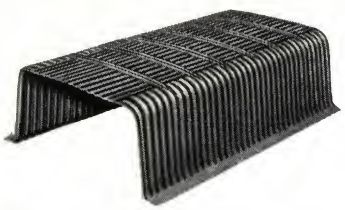
Truscon Welded Steel Fabric

Column Hooping, Collapsible

Truscon Collapsible Column Hooping, for reinforcing concrete columns, is shipped in the form of flat, circular coils of exact diameter and accurately spaced by means of special spacers.

Truscon Floretyle Construction

Truscon Floretyle Construction consists of rows of specially formed steel Floretyles separated by reinforced concrete joists and covered with a thin layer of concrete. Ribbed Steel Floretyles used in this construction are manufactured in powerful presses operated with multiple dies which insure accuracy and uniformity. Across the tops, deep stiffening ribs give the Floretyles exceptional rigidity. The corrugated sides, rounded corners and corrugated flanges along the bottom edge add to the stiffness and prevent deformation.



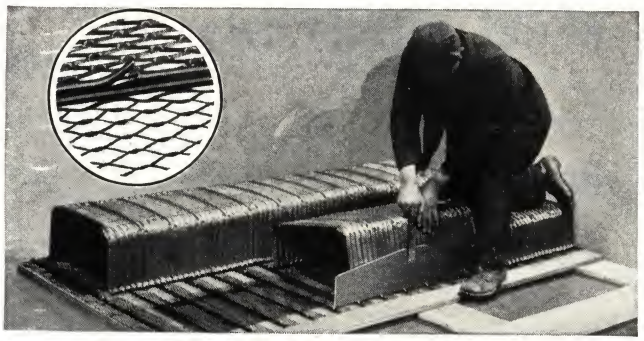
Properties of Ribbed Steel Floretyle—*Standard Heights*—4, 6, 8, 10, 12, 14 in.

***Standard Lengths*—** Nominal, 2 ft. 2 in. and 1 ft. 1 in.

Actual length is about 1 in. greater to provide for end lap. End caps to close the Floretyle furnished in all heights, and fit snugly.

Truscon Locktyle System

Truscon Locktyle consists of deep-ribbed steel Floretyle whose flanges are locked into the prongs of the ribs of Truscon Locktyle Lath. Locktyle construction is easily and speedily erected. It saves in concrete and plastering costs and insures true and straight concrete joists with positive attachment of the ceiling in reinforced concrete construction. Truscon Locktyle Lath is furnished in rolls 100 ft. long, 2 ft. wide. It consists of ribs ⅜ in. high, spaced 4.8 in. center to center, with a diamond mesh between the ribs.



Placing Floretyles in Locktyle Construction
Inset shows close-up of lath prong

Channelplate Floor System

(Patent Applied For)

The Truscon Channelplate Floor System is designed for medium and heavy loading, and offers important economies, especially where the total floor load exceeds 150 lbs. per sq. ft.

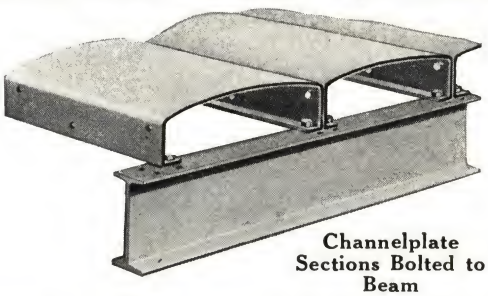
Description—This structural steel floor consists of a series of Channelplate sections bolted web to web and with the flanges bolted, riveted or welded at the ends of the Channelplate to the structural supporting frame.

The Channelplates are pressed from open hearth steel plates of varying thicknesses. When the web of the Channelplate is bolted to the web of the adjacent section, the double web and flanges form an I-beam section that occurs at intervals of 20, 22 or 24 in.

The top flange between I-beams is arched with a standard crown height of ¾ in., thereby providing unusual stiffness and a high resistance to impact or moving loads.

A wearing surface of concrete reinforced with welded steel fabric, asphalt mastic, or other materials as desired, is applied directly to the Channelplate construction.

Advantages—Channelplate floors are from 25 to 60 lb. per sq. ft. lighter than the ordinary types of floors used for medium or heavy duty loadings. The result is a worthwhile saving in



Channelplate Sections Bolted to Beam

the structural steel frame required for its support and in the total weight of the structure.

Channelplates arrive completely fabricated and are readily installed. They are self-supporting—there is no need of centering or other temporary supports. As soon as supporting frame has reached floor level, the Channelplates can be laid. They are erected by the same labor, and at the same time, as the structural steel. Being made of steel, heavily painted, there is nothing to prevent their erection in any kind of weather. Their strength is such that they can be laid temporarily, if desired, and used as working or storage platforms.

Details of standard sections and the several accessories are extremely simple. This simplicity results in numerous economies and imparts to the construction a rugged durability.

The Truscon Channelplate Floor System design conforms to the American Institute of Steel Construction specifications

Installing Channelplate Sections

and can easily be fireproofed according to local Underwriters' requirements.

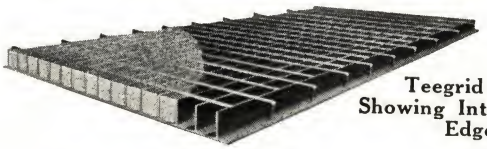
Truscon Teegrid Bridge Floors

(Patent Applied for)

Designed to meet the severe loading requirements and vehicular traffic of modern highway bridges while reducing the dead load by a considerable amount.

Description—Teegrid Bridge Flooring consists of load-bearing T-sections and load distributing bars at right angles to each other, with the intervening spaces filled with concrete vibrated into place. Teegrid incorporates the engineering design and field erection features which past experience proves are necessary and insures satisfactory performance with minimum of maintenance and a low initial cost.

The fabrication of Teegrid involves the welding of T-sections, flange to flange, with the stems extending upward. Teegrid



Teegrid Unit, Showing Interlocking Edge

bars are then pressure welded to the vertical stems, at 4-in. centers, with the flat side of the bar level with the top edge of the "T" stems, to form a rigid, solid slab unit.

The finished product is a solid, homogeneous frame with tremendous strength per unit of weight, presenting a steel armored surface to the traffic. Unit sections are 4 ft. wide (maximum) and the desired length. They may be shop-curved to meet conditions such as inclines and crowned roadways.

Holes are shop-punched in the "T" flanges at the bearing points in the supporting steel framing to facilitate plug welding or riveting during erection. An ingenious arrangement of the Teegrid bars along the outside edge of the unit develops a positive interlock at each joint when the concrete is vibrated in

Vibrating Concrete into Place on Teegrid Floor

place, thus insuring distribution of loads at the joints from one unit to the adjoining unit.

Advantages—Teegrid Bridge Floors offer the following advantages and features:

(1) An engineering design capable of carrying all types of bridge loading specifications.

(2) Maximum carrying capacity with minimum dead weight.

(3) Low initial cost of material, simple erection and minimum maintenance.

(4) Light weight effects considerable saving in bridge structure.

(5) Erection of truss members, floor framing and Teegrid by the structural steel erector.

(6) Absolute continuity of material and load distribution throughout entire structure.

(7) Concrete and steel form homogeneous plate.

(8) Elimination of field forms for concrete wearing surface with consequent savings and reduction of hazardous work.

(9) The erection of Teegrid units provides an immediate safe working floor.

(10) Concrete can be poured and vibrated in place as soon as Teegrid is erected, thus permitting the speedy opening of the bridge.

(11) A wearing surface armored with steel, offering great resistance to traffic abrasion.

WICKWIRE SPENCER STEEL COMPANY

GENERAL OFFICES
41 East Forty-second Street, NEW YORK, N. Y.

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CLEVELAND, OHIO, 1217 Guarantee Title Building
TULSA, OKLA., 314 East Archer Street
SAN FRANCISCO, CAL., 114 Townsend Street
SEATTLE, WASH., 1025 Sixth Avenue, So.
PORTLAND, ORE., 361 14th Street, No.

Product

CLINTON ELECTRICALLY WELDED WIRE FABRIC for Concrete Reinforcement.

For our pages on Wire and Iron Fences and Gates, Woven Wire Lath, and Metal Grilles, see Manufacturers' Index.

Clinton Electrically Welded Wire Fabric

Scope of Use—Clinton Electrically Welded Wire Fabric, a mesh reinforcement, is especially satisfactory for floors, walls, roads, sidewalks, sewers, reservoirs, levees and all forms of slab construction work.

When used to strengthen floor slabs the large longitudinal wires are located in the line of greatest tension. The transverse, or secondary, members, arranged at right angles to them, afford a most efficient means of distributing concentrated loads in a direction perpendicular to the main reinforcing members.

Because of its efficient lateral as well as longitudinal strength, Clinton Welded Wire Fabric prevents cracking due to changes in temperature.

Material—It is rectangular wire mesh with its points of intersection securely welded by a patented electrical process. It is furnished in virtually any size of wire.

The fabric is manufactured from a special grade of high quality steel wire possessing such strength, elasticity and ductility as to render it ideally suited to structural use. The wire possesses an average ultimate strength of 65,000 to 75,000 lb.

Finish—Clinton Electrically Welded Fabric is furnished either in plain steel or galvanized.

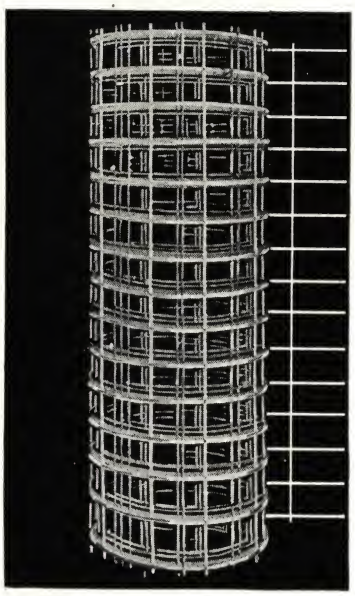
Economy and Accuracy of Installation

The fabric is delivered in rolls and may be laid in continuous sheets up to 200 ft. in length, or may be furnished in sheets of desired length. There are no weak points, no lapped ends, no waste. Great quantities can be laid quickly and accurately by unskilled labor, with the assurance that every strand is in its proper position. This renders it a simple, safe and most economical reinforcing material for all forms of slab construction.

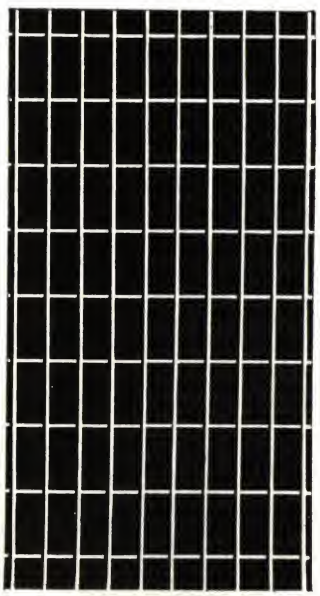
STANDARD SIZES—CLINTON WELDED FABRIC

Style No.	Spacing of wires		Size wires W&M gauge		Sec. area of steel per ft. width, sq. in.		Wt., per 100 sq. ft., lb.	Standard rolls	
	Longitud'nl, in.	Transverse,in.	Longitud'nl	Transverse	Longitud'nl	Transverse		Width, in.	Lgth., ft.
*216-28	2	16	2	8	.325	.015	119.4	60	150
*216-38	2	16	3	8	.280	.015	103.6	60	150
*216-49	2	16	4	9	.239	.013	88.5	60	150
*216-510	2	16	5	10	.202	.011	74.6	60	150
*216-610	2	16	6	10	.174	.011	64.7	60	200
*316-28	3	16	2	8	.217	.015	82.6	84	150
*316-38	3	16	3	8	.187	.015	72.0	84	150
*316-49	3	16	4	9	.160	.013	61.4	84	150
*316-510	3	16	5	10	.135	.011	51.8	84	150
*316-610	3	16	6	10	.116	.011	45.1	84	200
*416-38	4	16	3	8	.140	.015	56.1	84	150
*416-49	4	16	4	9	.120	.013	47.9	84	150
*416-510	4	16	5	10	.101	.011	40.4	84	200
*416-610	4	16	6	10	.087	.011	35.2	84	200
*416-711	4	16	7	11	.074	.009	29.7	84	200
*412-812	4	12	8	12	.062	.009	25.5	84	200
*412-912	4	12	9	12	.052	.009	21.8	84	200
*412-1012	4	12	10	12	.043	.009	18.6	100	300
*412-1212	4	12	12	12	.026	.009	12.6	100	400
412-55	4	12	5	5	.101	.034	48.4	72	200
412-66	4	12	6	6	.087	.029	41.6	72	200
412-77	4	12	7	7	.074	.025	35.4	72	200
412-88	4	12	8	8	.062	.021	29.6	72	200
* 59-1212	5	9	12	12	.021	.012	11.8	100	400
612-06	6	12	0	6	.148	.029	65.3	72	†
612-33	6	12	3	3	.093	.047	51.2	72	200
612-44	6	12	4	4	.080	.040	43.8	72	200
612-55	6	12	5	5	.067	.034	37.0	72	200
612-66	6	12	6	6	.058	.029	31.8	72	200
612-77	6	12	7	7	.049	.025	27.0	72	200
22-1010	2	2	10	10	.086	.086	60.3	56	200
* 22-1212	2	2	12	12	.052	.052	36.8	56	300
44-44	4	4	4	4	.120	.120	85.3	84	150
44-66	4	4	6	6	.087	.087	61.9	84	150
44-88	4	4	8	8	.062	.062	44.1	84	200
66-44	6	6	4	4	.080	.080	57.8	84	200
66-55	6	6	5	5	.067	.067	48.8	84	200
* 66-66	6	6	6	6	.058	.058	42.0	84	200
66-77	6	6	7	7	.049	.049	35.7	84	200
* 66-88	6	6	8	8	.041	.041	30.0	84	200
* 66-1010	6	6	10	10	.029	.029	20.7	96	300

*Denotes sizes ordinarily carried in stock. †Shipped only in flat sheets.



Roll of Clinton Electrically Welded Wire Fabric, 48-in. Width
Shipped also in sheets if desired



Clinton Welded Fabric
Also furnished in sheets when desired

CONVER STEEL & WIRE CO., INC.

Manufacturers of Wire and Flat Steel Products for Building Construction

TELEPHONE
MOtt Haven 9-1600

621-631 East 132nd Street, NEW YORK, N. Y.

Products

WIRE CLIP REINFORCEMENT for Concrete Fireproofing; FORM SPACERS.

Also Reinforcing Bar Cutters and Benders, Steel and Galvanized Mortar Boxes, Special Tools, Bridle Irons, Wall Ties and Ashlar Anchors.

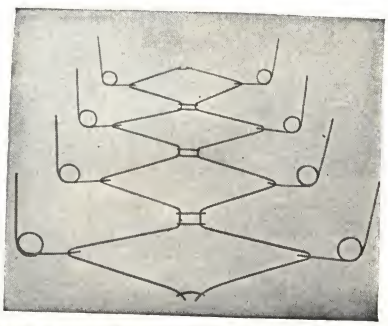
For our page on Ladder Stud, Hangers and Hairpins, Corner Bead, Base Bead, see Manufacturers' Index.

Concrete Soffit Clips and Fireproof Construction

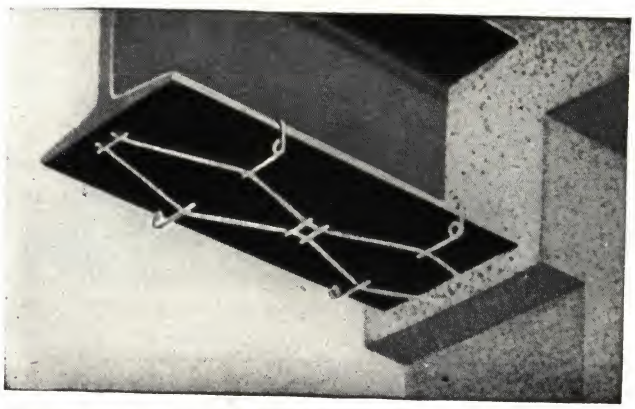
Proper soffit reinforcing is a detail of fireproof construction which is often considered a matter of secondary importance. As a result of vague specifications and lax requirements, the method of covering structural steel with concrete is too frequently left, in an indefinite manner, to the discretion of the general or fireproof contractor and the ultimate results are dependent upon his experience and integrity in this type of construction.

As a soffit reinforcement, no other reinforcing materials have met with greater success than our present well-known line of Reed Expansible, Economy and Master Clips. They are made from high grade steel with all members electrically welded and assure rigidity regardless of size or shape into which a strip may be cut. These clips may be adapted to the most intricate shapes with accurate and exact location.

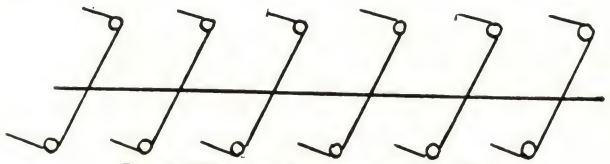
All beams may be wrapped with these clips enabling the contractor to use them with equal facility and economy in fireproofing either buildings or heavy bridge work. Their extensive use has proved them most efficient and satisfactory for reinforcing these thin protective layers of concrete.



Actual Perspective Photograph Showing Style B Clip Expanded 14 Inches



Illustrating Perfect Soffit Reinforcing Reed Clip on Beam



Reed Clips on Longitudinal Wire

Reed Clips

These clips are welded to a wire 5 ft. 6 in. in length. Fifty lengths or 250 ft. are packed in a bundle. Made in sizes from 3 in. and up. Double length wires are used in sizes over 9 in. For extremely wide flanges three or more longitudinal wires are furnished. Spacing can also be varied to suit special requirements.

Individual Clip

Can be used for Bethlehem, Carnegie or standard sections, also for channels and girders. The very best grade of drawn steel wire is employed in the manufacture of this clip.

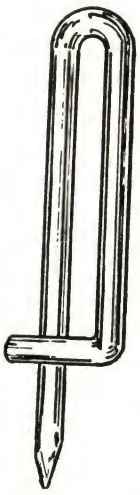
The reed clip owes its great advantage to the fact that it can be applied from one end of the beam or girder and worked along its entire length without the mechanic so much as moving from his position at the end of the member. The small loop in clip offsets it from face of flange.

Three Types of Form Spacers

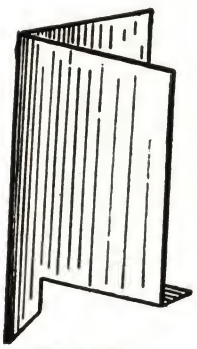
These three types of form spacers have proved themselves a boon to the fireproofer. They keep the forms an even distance away from the flanges of girders and columns and provide a smooth even finish to the job. They are accurate, economical and efficient.

The wire spacers come in all sizes from 1½ to 3 inches, of one gauge of wire only, thereby keeping their cost to a minimum. The slight opening between the parallel wires assures a positive bond and they will not, therefore, pull out of concrete when forms are stripped.

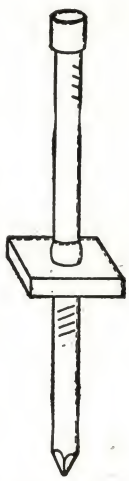
Xact Metal Form Spacers are made of 14-gauge specially treated sheet metal. The sharp wedge at the bottom permits these spacers to be easily driven into the lumber and a small lip prevents it from going beyond the required distance.



Economy Form Spacer



Xact Metal Form Spacer



Economy Form Spacer

MITCHELL-TAPPEN COMPANY

Standardized Metal Caging (S.M.C.)

15 John Street, NEW YORK, N. Y.

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BALTIMORE, MD., J. Bayward Embick, 813 American Bldg.
BOSTON, MASS., Robert B. Campbell, 49 Ellery Street
DALLAS, TEX., R. J. De Wees Co., 3015 Grand Avenue
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GREENVILLE, S. C., R. P. Sweeny Co.
INDIANAPOLIS, IND., Architectural Engineering Co., 105 Capitol Street
MIAMI, FLA., Brandt-Smith Co., 415 Miami Bank & Trust Bldg.
MINNEAPOLIS, MINN., Rockwell Engineering Co., 418 Exchange Bank Bldg.
MONTREAL, QUE., C. G. Porter & Co., 215 New Berks Bldg.
SAN FRANCISCO, CALIF., Gates-Tatterson Co., Inc., 346 Calle Bldg.
SEATTLE, WASH., H. E. Terrell, 1803 Fourteenth Avenue
SYRACUSE, N. Y., G. H. Parry, 703 Chimes Bldg.
TORONTO, ONT., H. A. J. Aldington, 43 Adelaide Street, W.
UTICA, N. Y., H. H. Frey, 1612 Holland Avenue

Importance of Standardized Metal Caging

Structural steel, to be properly protected from fire or corrosion, must be covered with approximately 2 in. of concrete.

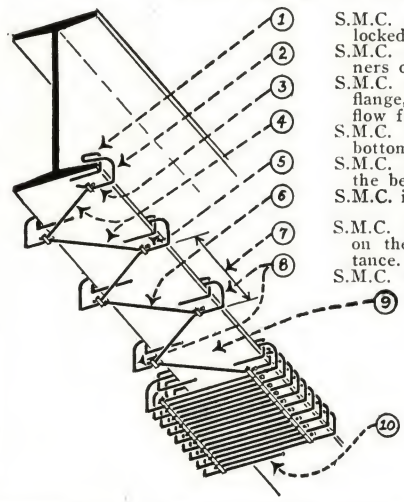
When fire hits the beam soffits, the corners of the soffits, unless properly protected and reinforced, will shatter and crumble off, exposing the steel beams to the full heat of the flames.

Vibration too is liable to cause improperly reinforced soffits to crack. The falling concrete not only leaves the steel unprotected and exposed to corrosion and fire, but also may do serious damage to persons and material underneath.

To use ordinary beam wrapping for soffit reinforcement is more or less a waste of money, *since ordinary beam wrapping does not reach out into the corners which are the weakest parts of the soffits.* For this reason, railroad engineers purposely omitted specifying concrete protection on the underside of steel members. But with the advent of S.M.C. they have specified it on more than 500 bridges.

S.M.C. extends both below and beyond the beam flange, holding the concrete firmly in place regardless of heat, vibration, knocks and cracks. For reliable fireproofing of steel, specify concrete reinforced by S.M.C. It offers, we claim, the best combination obtainable.

Advantages of S.M.C.



1. S.M.C. is securely anchored and locked to the beam flange.
2. S.M.C. extends out into the corners of the soffits.
3. S.M.C. projects below the beam flange, allowing the concrete to flow freely.
4. S.M.C. is entirely clear of the bottom of the beam.
5. S.M.C. is definitely offset from the beam at a fixed distance.
6. S.M.C. is continuously interlocked.
7. S.M.C. automatically spaces itself on the beam at the proper distance.
8. S.M.C. is alternately spaced on the beam.
9. S.M.C. allows the concrete to flow freely. There is nothing to obstruct it.
10. S.M.C. is delivered collapsible and it is easy to handle and apply.

S.M.C. is made from specially drawn No. 12 gauge galvanized wire, electrically welded to eliminate all possibility of its coming apart when applied. When being applied to the beam it automatically takes its proper position both below and beyond the beam flange, spacing itself out on the beam and requiring no further adjustment.

S.M.C. allows the concrete to flow freely to every part of the soffit. With S.M.C. there are no hollow soffits to patch and repair after the forms are pulled.

Standard Soffit Specification

All beam and channel soffits shall be reinforced with a continuous caging made of not less than No. 12 gauge galvanized wire with electrically welded joints and so manufactured that it will, when applied, automatically take a predetermined offset of at least ¾ in. below entire width of beam flange, and also beyond the edge of the lower beam flange, in order to insure proper reinforcement of the corners of the soffits. This reinforcement shall be so designed that it will not dam the flow of concrete and thus form cavities underneath the flange.

Where beams are in excess of 18 in. deep, the haunches shall be reinforced with No. 12 gauge wire running from the lower flange up over the top of the beam and bent over the opposite side. Channels shall be protected with concrete reinforced with material properly designed to meet the above requirements with channels.

On beams of less than 18 in. deep, the reinforcement shall be pulled out or adjusted as it is being applied to the beam in order to insure proper fit, not before.

SIZES OF S.M.C. FOR BEAM AND COLUMN FLANGES*

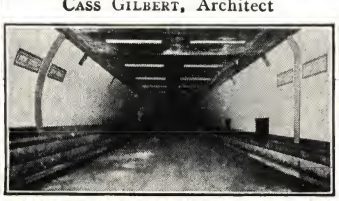
S.M.C. Size	Jaw opening, in.	Size of flange, in.			S.M.C. Size	Jaw opening, in.	Size of flange, in.		
		Width		Max. thickness			Width		Max. thickness
		Min.	Max.				Min.	Max.	
A	7⅜x ⅝	3	6¼	9/16	12	16⅜x1⅛	13½	15¼	1 1/16
B	10¼x ⅞	6⅛	9	13/16	12-1	16½x1 9/16	13½	15¼	1½
B-1	10¼x1 9/16	7	9	1½	12-2	16⅜x1 15/16	13½	15¼	1¾
C	13 x ⅞	9	11¾	13/16	12-3	16⅜x2 15/16	13½	15¼	2¼
C-1	13 x1 9/16	9	11¾	1½	13-1	18¼x1 9/16	15¼	17	1½
11	14⅝x1⅛	11¾	13⅜	1 1/16	13-2	18¼x1 15/16	15¼	17	1⅞

*FOR CHANNELS—One size Channel material covers all requirements.

Above left
New York Life Insurance Co. Building, New York, N. Y.
CASS GILBERT, Architect

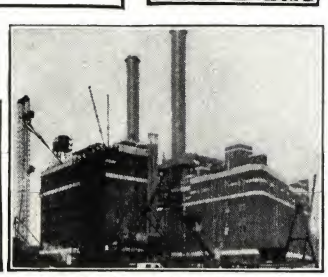
Above right
Penobscot Building, Detroit, Mich.
SMITH, HINCHMAN & GRYLLS, Architects and Engineers

Buildings for Duke University, Durham, N. C.
HORACE TRUMBAUER, Architect



Hudson River Vehicular Tunnel
NEW YORK and NEW JERSEY BRIDGE and TUNNEL COMMISSION

New York Connecting Railway Viaduct, Long Island City, N. Y.



Fourteenth Street East River Power Plant of New York Edison Co.
THOMAS E. MURRAY, INC., Engineers

Prominent Structures on Which Standardized Metal Caging (S.M.C.) Was Used

UNION STEEL PRODUCTS COMPANY

Reinforcing Steel Accessories

ALBION, MICH.

BRANCH OFFICES

CHICAGO, ILL., 1148 Builders' Building—Telephone, Randolph 6635

DETROIT, MICH., Penobscot Building—Telephone, Randolph 5500

Products

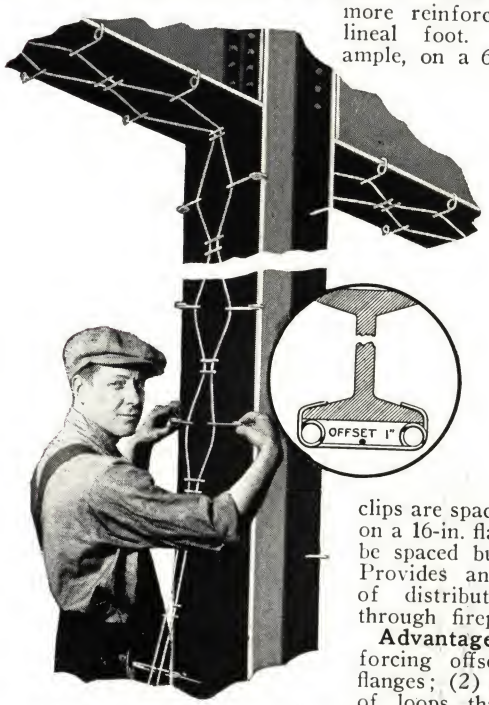
BAR SPACERS and SUPPORTS; BEAM CAGING; CONTINUOUS CHAIR STIRRUPS; SLEEPER ANCHORS; ANCHOR SLOT; CONCRETE ROAD ACCESSORIES.

For Union Steel Steel Joist and Metal Lath Accessories, see Manufacturers' Index.

Expansible Reed Clips

The Expansible Reed Clip is a perfect fireproofing reinforcement. It has been used on many of our biggest steel buildings. Reed soffit clips are continuous strips adjustable to beam or column flanges of any width.

Application—Two sizes perfectly wrap all flanges from 3 to 18 ins. wide. Clip is expanded, as shown, to fit flange width, shortening in greater widths to provide more reinforcement per lineal foot. For example, on a 6-in. flange clips are spaced 12 ins. apart, on a 16-in. flange they would be spaced but 8 ins. apart. Provides an ideal pattern of distribution of metal through fireproofing.



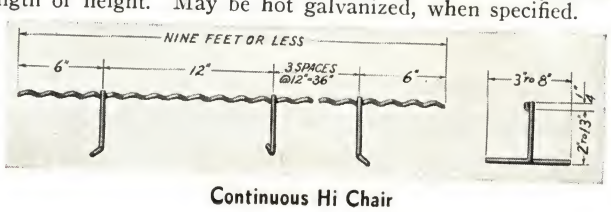
Advantages—(1) Reinforcing offset 1 in. from flanges; (2) gripping action of loops that holds reinforcing rigidly in place; (3) made in 4-ft. strips; (4) made of No. 12 galvanized hard steel wire; (5) electric welded at every joint; (6) reinforces wider flanges more thoroughly; (7) is much easier to handle on the job; and (8) costs less than usual approved forms of wrapping.

Sizes—US-1 Clips are 4 ins. wide and can be expanded to 12 ins. US-2 clips are 8 ins. wide and can be expanded to 18 ins. Stocked by building material dealers everywhere.

Union Continuous Hi Chair

Provides a rapid, accurate way of supporting and spacing bent up reinforcing steel. The Continuous Hi Chair costs no more than the old method of carrying bars and individual high chairs and produces a most acceptable job.

The Continuous Hi Chair is made of a heavy hard steel corrugated bar with legs welded every foot along its length. They are usually made in 5-ft. lengths, but may be made any desired length or height. May be hot galvanized, when specified.

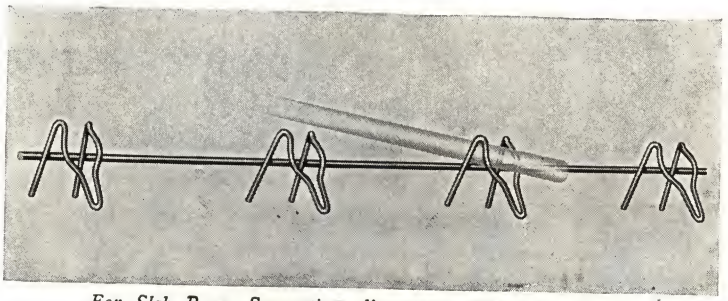


Continuous Hi Chair

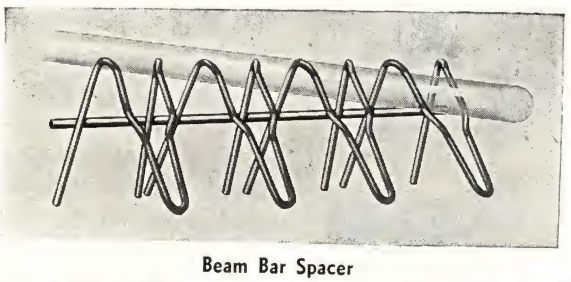
Snap-in Bar Spacers (Patented)

Union Snap-In Bar Spacers automatically space, support and tie bars in place. When snap-in spacers are specified perfect steel fabrication is assured.

Four applications of the snap-in principle are illustrated below for the following purposes:



For Slab Bars. Supporting clips are welded along the longitudinal rod any desired spacing. The steel setter merely places the continuous strips on the forms and snaps the bars in place. Each bar is rigidly held in place and supported by three legs directly under the bar. Snap-in Slab Bar Spacers are made in ½, ¾, 1, 1½ and 2-in. heights in any length. The snap-in clips will hold ⅜, ½ and ⅝-in. bars.

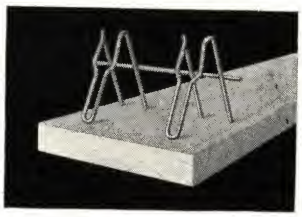


Beam Bar Spacer

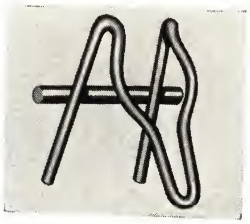
For Beam Bars. Clips may be spaced at any desired spacing and lengths made to fit the width of the beam. When two layers of bars are required in a beam, the snap-in spacers for top bars are made with two supporting longitudinal wires welded along the bottom of the spacer. Snap-in Beam Bar Spacers are made in 1, 1½, and 2-in. heights. The clips will hold ¾, ⅞, 1 and 1¼-in. round or square bars.

For Joist Bars. The bars are perfectly spaced from the sides and the bottom of the form and they cannot get out of place. The Snap-in Joist Spacer will not stop the flow of concrete and cause voids. Made for 4, 5, 6, and 7-in. joists, ¾, 1, and 1½-in. heights, and will hold ⅝ to 1-in. round or square bars.

Hi Chair. An individual chair that both supports and automatically ties the bar to the support. They are made of No. 7 hard steel wire, and made to hold bars from ⅜ to ¾ in. at any height from 1½ to 3 ins.



Joist Bar Spacer



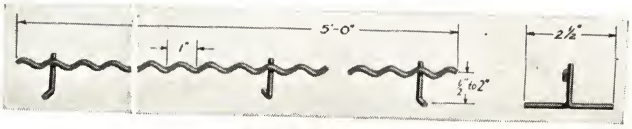
Individual Chair

Union Continuous Corrugated Slab Bar Spacers

The supporting bar on this continuous spacer is corrugated every inch so that by placing bars in the corrugations any desired spacing of bars may be secured.

They are made of heavy hard steel corrugated carrying bar with legs electrically welded every 5 ins. along its length.

They are stocked in 5-ft. lengths, and in ¾, 1, 1½ and 2-in. heights. May be hot galvanized when specified.



Slab Bar Spacers

FLOOR ACCESSORIES CO., INC.

Ankortite Shelf Angle Fixtures and Masonry Slots

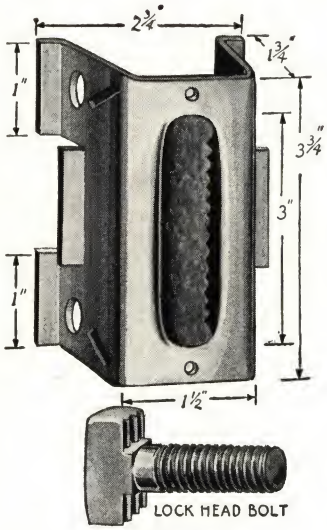
GENERAL OFFICE
KANSAS CITY, MO.

AGENTS IN PRINCIPAL CITIES

For Floor Joiners and Thresholds, Recessed Floor Bars and Terrazzo Dividing Bars, and Tackless Carpet Strips, see Manufacturers' Index

ANKORTITE SHELF ANGLE FIXTURES

Provide Adjustment of Bolts for Anchoring Shelf Angles, Lintels, Overhead Doors and Other Attachments to Concrete Beams or Columns



Patent Pending

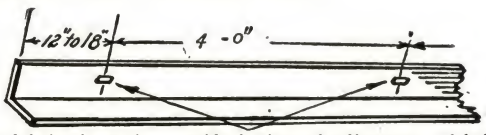
Bolt adjustment for anchoring shelf angles for carrying masonry facings is provided by Ankortite Shelf Angle Fixtures. The fixtures consist of a rectangular box inside of which are serrations meshing with notches on the bolt head and holding it firmly fixed when the bolt is tightened.

The fixtures are nailed inside the concrete forms and when the forms are removed they present a vertical slot 3 ins. long in the face of the concrete. The diverging slides and outwardly extended flanges give them a tremendous hold in the concrete—laboratory tests showing a load capacity of 20,850 lbs. per fixture.

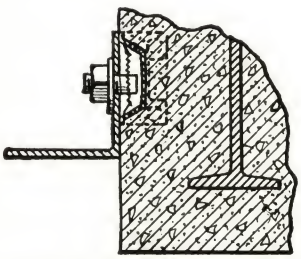
They are used in either steel frame or reinforced concrete construction and are generally spaced on 3 or 4-ft. centers. Their cost, therefore, is less per lineal foot of angle than ordinary bolts on 18-in. centers. In addition, they show a great saving in time and labor required to bore holes and fasten bolts in the forms; to enlarge holes in the angles to receive misplaced bolts, and to cut the masonry to fit fixed angles previously attached, since with this method the angles are placed as the masonry is built up, the angle being adjusted to its proper position as the bolts are tightened. Any necessity, therefore, for chipping or marring the masonry facing is eliminated.

The locking feature of the bolt in the fixture absolutely prevents any movement after the angle is attached, as the fulcrum pull of the angles meshes the notches tighter as the load increases.

Ankortite Shelf Angle Fixtures are made of .109-in. rust-resisting copper-bearing steel and may also be cadmium treated or zinc coated after forming, if desired. They are furnished with either ⅝ or ¾-in. lock-head bolts. Standard length of bolt is 1½ in. under the head. Longer bolts can be furnished when necessary at slight additional cost.



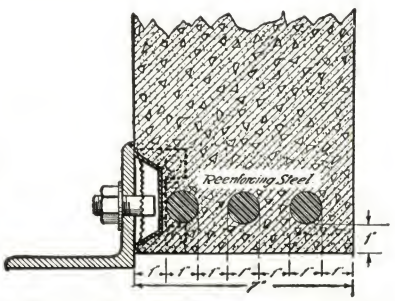
Slotted holes in angles provide horizontal adjustment of bolt and Ankortite Fixtures provide vertical adjustment



In steel frame construction the fixtures are placed in the concrete fireproofing. This eliminates costly brackets attached to the structural steel

Prices

Fixture complete with bolt, nut and washer:
Using ⅝x1½-in. bolt.....$20.00 per 100
Using ¾x1½-in. bolt.....$20.50 per 100
Cadmium or zinc coating.....$5.00 per 100 extra
Freight allowed on 100 fixtures or more.



Fixture does not interfere with re-enforcing rods, permitting them to be placed within 1 in. of face of concrete

Typical Specifications Shelf Angle Fixtures

For anchoring shelf angles and lintels, place and nail in an upright position in the concrete forms Ankortite Shelf Angle Fixtures as manufactured by the Floor Accessories Co., Inc., Kansas City, Mo. These fixtures to be spaced to correspond with the slotted holes to be punched in the angles.

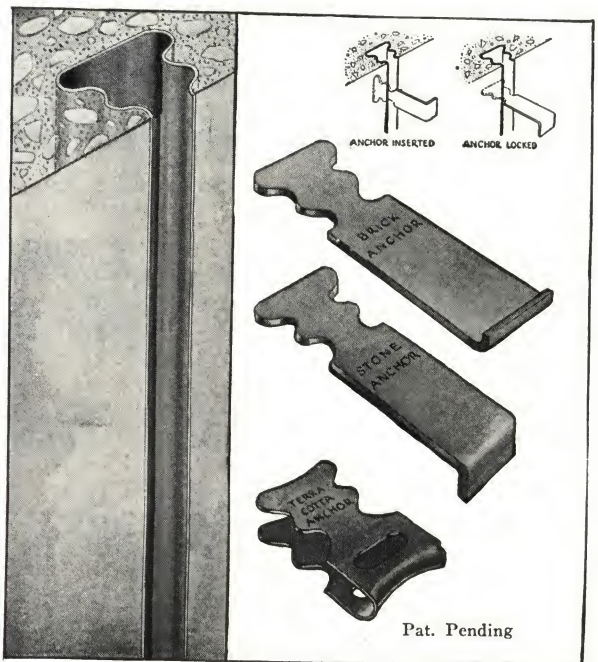
ANKORTITE MASONRY SLOTS

For Anchoring Masonry Facings to Concrete

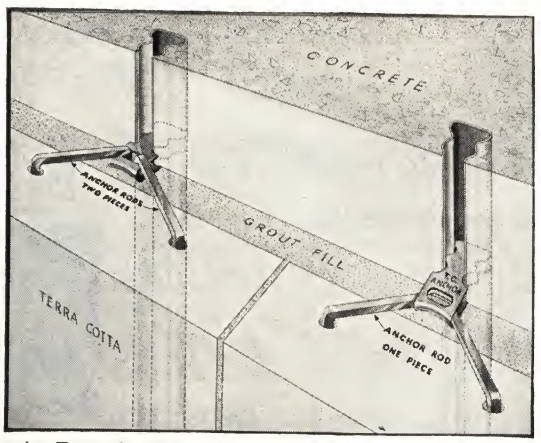
Ankortite Masonry Slots and Anchors provide an adjustable method of anchoring brick, stone and terra cotta to concrete and give the highest degree of strength with substantial economies in time and labor. The slot is nailed inside the concrete forms and becomes an integral part of the building. The anchors, which are keyed into the slot by a quarter turn, may be placed at any location as the masonry courses are built up, eliminating the necessity of measuring for course heights. Boring the forms is eliminated and a substantial saving is effected in stripping as well as in the salvage of the lumber, which is undamaged by holes.

The undulating sides give the slot greater anchorage in the concrete and provide more bearing surface for the anchors. The shoulders on the anchors conform snugly to the undulations in the slot and give a double hold without looseness.

The slot is made of rust-resisting copper-bearing cold rolled steel .025 in. thick and is further insured against rust or corrosion by a tight zinc coating evenly applied on all surfaces and on the exposed edges as well. The metal is formed in gradual bends so that this protective coating is not cracked in forming as is the case where galvanized metal is subjected to sharp breaks or corners.



Note: **Wood blocks conforming in shape to the slot and 1 in. long are furnished without charge to be inserted in the top end of each slot to prevent concrete from entering.**



Ankortite Terra Cotta Anchors consist of one piece only and will not turn or fall down when keyed into the slot. Anchor bars may be cut in two pieces and hooked into the anchor or they may be one piece with both ends turned down, bent in the center and looped through the anchor as shown in the illustration. They can be used with grout fill as thin as ½ in. or without any grout fill by allowing loop to extend into the mortar line.

Note: **The anchor bars are a separate item and are not included in the price of the terra cotta anchors.**

Anchors for brick, stone and terra cotta are made from rust-resisting copper-bearing steel 1⅛ in. wide by .109 in. thick and have a tensile strength of 3,400 lbs. per anchor. We also make them of $\frac{3}{16}$-in. diam. wire, which has a tensile strength of 1,933 lbs. All anchors have the cadmium rust-proof treatment after they are formed which protects the edges as well as the other surfaces.

Tests made by the Robert W. Hunt Company to determine the comparative strength of slots and anchors having plain sides and those having undulating sides showed the following result:

Plain sides, ultimate load.....1580 lbs.
(Anchor cupped and slipped out of slot.)
Undulating sides, ultimate load.....2770 lbs.
(Concrete failed. No distortion of slot or anchor.)

The concrete used in these tests was of 1:2:4 mix 40 days old. Thickness of anchors, .109 in.

Prices

Ankortite Slot, 10-ft. lengths.....$33.50 per 1000 ft.
(Longer or shorter lengths on specification)
Brick Anchors, 1⅛x.109x3¾ in. ..... 22.50 per 1000 pcs.
Brick Anchors, $\frac{3}{16}$-in. diam. wire by 3¾ in.. 15.00 per 1000 pcs.
Terra Cotta Anchors, 1⅛x1⅛ in. ..... 20.00 per 1000 pcs.
Terra Cotta Anchors, $\frac{3}{16}$-in. diam. wire by 1⅛ in. ..... 15.00 per 1000 pcs.
Stone Anchors, 1⅛x.109x3½ in. ..... 22.50 per 1000 pcs.
Stone Anchors, $\frac{3}{16}$-in. diam. wire by 3½ in.. 15.00 per 1000 pcs.
Longer stone anchors, per 1000 additional:
Flat metal, $1.50 for each extra inch.
Wire, $1.00 for each extra inch.
All prices are with freight allowed.

Note: **Anchor measurements are from face of concrete.**

Typical Specifications Ankortite Masonry Slots

In all concrete columns, beams or walls which are to be faced with brick, stone or terra cotta the contractor for concrete work shall furnish and vertically install Ankortite Masonry Slots. One slot to be placed in all columns up to .... in. wide and two or more slots in wider columns. In all beam faces and walls the slots shall be spaced on .... in. centers.

The masonry contractor shall furnish and install Ankortite Masonry Anchors suitable for the different types of masonry facing to be keyed into the slot wherever it occurs on each ... course height.

Ankortite Masonry Slots and Anchors are manufactured and marketed by the FLOOR ACCESSORIES CO., INC., Kansas City, Mo.

Note: **Customary spacing of slot is 12 to 17-in. centers, and for brick facing brick anchors are laid in every fifth course; stone and terra cotta anchors in each mortar line.**

THE BULL DOG FLOOR CLIP CO.

Floor Clips, Buck Anchors, Wall Anchors, Furring Anchors

108 North First Avenue, WINTERSET, IOWA

135 BRANCH REPRESENTATIVES AND 20 CONVENIENT DISTRIBUTING PLANTS

Product

BULL DOG FLOOR CLIP for anchoring Wood Floors to Concrete, with or without a fill.

Advantages of Bull Dog Floor Clips

(1) That the Bull Dog Method is practical is evidenced by the fact that more than 26,000,000 units are in use, in more than 8000 buildings.

(2) A one-piece clip, made of heavy 18 and 20 gauge galvanized iron. Shows no weakness, no joints or hinges to break or corrode. Easily placed by straightedge method.

(3) Affords adequate anchorage by engineer's test.

(4) *Dry rot* elimination is greatly enhanced because of dead air space rather than rot from moisture, and floor and sleeper deterioration from acid reaction.

(5) Proper size nails are furnished *free*. Friction-tight nail fitting guarantees rigid sleeper anchorage.

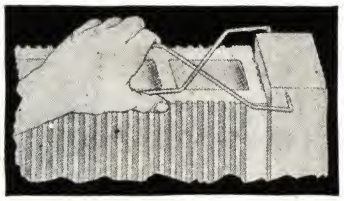
(6) Provide a perfectly firm, *level* floor. Abundant anchorage defeats all possibility of floor buckle, dome, or squeak.

(7) Save 5¢ per sq. ft. by avoiding the cost of material and labor for a concrete fill. Also save labor cost of beveling and shimming of sleepers.

(8) Can be placed for ½¢ or less each, and sleepers can be laid 50% faster than if anchored by a fill material. Standard clips spaced 16 in. on center require 576 anchors per 1000 sq. ft. of floor slab.

(9) Reduce dead load 18,000 lb. per 1000 sq. ft. of floor area, which provides also a saving in a proportionate amount of reinforcing steel.

(10) 135 representatives, also stocks are maintained at 20 points, making possible emergency delivery service, as required. Both junior and standard sizes for 2x2, 2x3, and 2x4 sleepers.



The New Bull Dog Buck Anchor

Literature provided

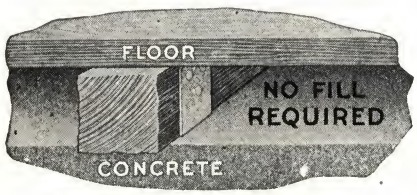
For floors where ordinances require a fill, or where a light clip is desired, the Bull Dog Junior effects a still greater saving in anchoring wood floors to concrete.

It is one-half the width of the regular Bull Dog Clip and is also made in three sizes, 2x2, 2x3 and 2x4.

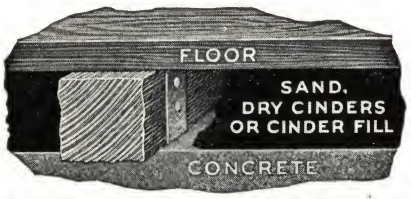
With a fill, we suggest spacing 16 in. and 2½ ft. which requires about 300 clips per 1000 sq. ft. of slab at a cost, including installation, of $9.00. This cost is more than offset in the time and expense of bracing the strips, beveling, etc., and a large saving in expense of fill, material and labor.

Nails Now Furnished without Charge

A sufficient quantity of friction tight nails are included in each shipping case (gratis) which insures solid anchorage of sleepers to floor clips.

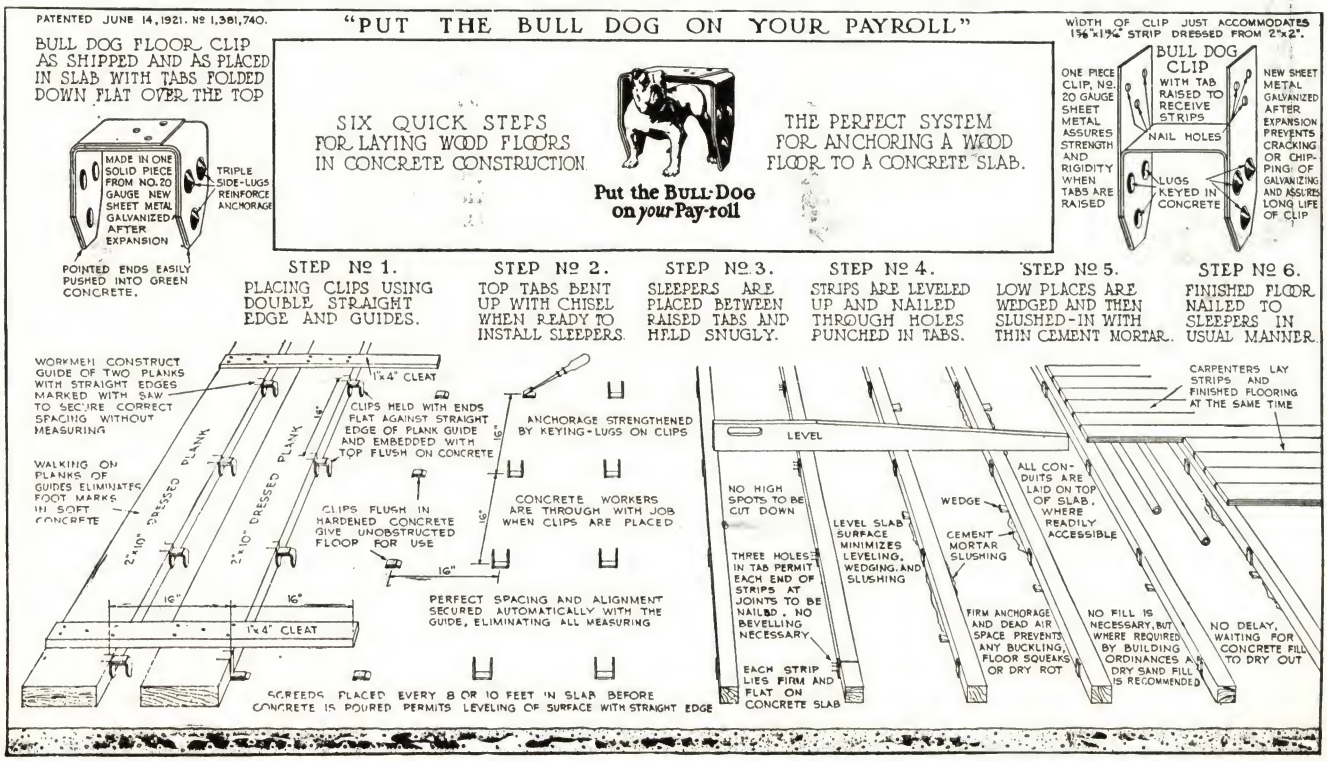


Bull Dog Standard without a Fill



Bull Dog Junior Where Fill Is Required

Users of Bull Dog Floor Clips are protected by reissue Patent 15881, July 29, 1924; Process Patent 15387430, May 19, 1925



BULL-DOG FLOOR CLIPS — INSTALLATION DATA.

MUNSON MANUFACTURING CO.

Manufacturer of "Grip-Tite" Veneer and Floor Anchors

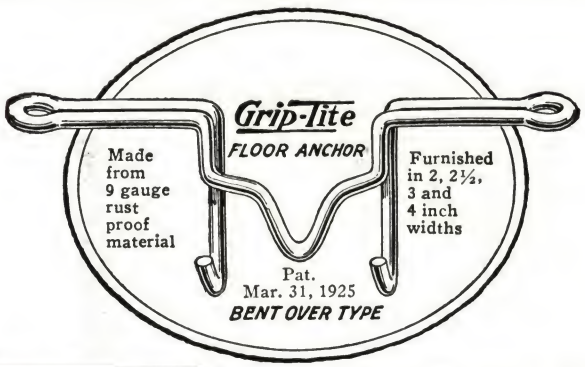
WINTERSET, IOWA

REPRESENTATIVES IN PRINCIPAL CITIES

Grip-Tite Floor Anchor

Grip-Tite

Grip-Tite Floor Anchors make it possible to efficiently and economically fasten sleepers to concrete base without beveling or without fill.



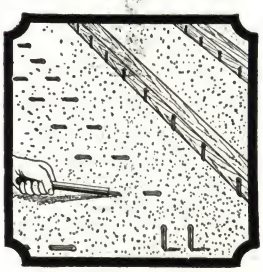
First insert anchors in wet concrete. This is quickly and accurately done by using a Plank Guide (blue print furnished free) and placing four rows before shifting

Strong and Positive—Note that the Grip-Tite Anchor has three members which are securely embedded in concrete when the slab is poured. Floors installed by the Grip-Tite method (as shown below) do not "move" or "squeak."

Advantages—The Grip-Tite method is permanent—no dry rot. It reduces dead weight about 18,000 lb. per 1,000 sq. ft. and saves from 30% to 50% in costs or about 5¢ per sq. ft. Thousands of satisfied users approve the Grip-Tite method.

Specifications—Furnish in place according to manufacturer's directions "Grip-Tite" Floor Anchors as manufactured by the MUNSON MANUFACTURING Co., of Winterset, Iowa, for attaching all sleepers where wood floor occurs over concrete. Drive wedges under sleepers from both sides to level. Nail anchors to sleeper. Slush a concrete grout of 1:5:8 mix under sleepers to give them a solid base their entire length.

Note: If a fill is required, a dry fill will prove very efficient and economical. Fill between sleepers to within ⅓ in. of top with (dry sand—dry-fill gypsum—insulex—cinder concrete—concrete of 1:5:8 mix, state which).



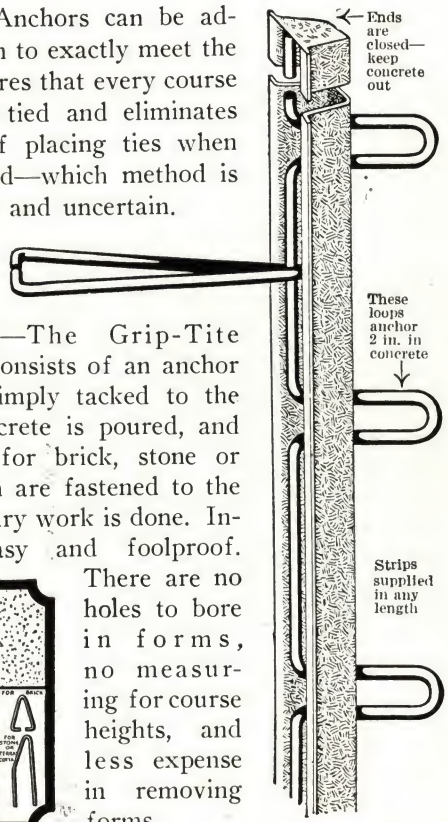
When ready to lay floor, raise the side loops of the anchor and place an ordinary 2x2, 3x3 or 4x4 between anchors. *No beveling is necessary*

Wedge sleepers up to level. Nail anchor to sleeper and grout with a rich mixture of cement. *No fill is necessary* but, if specified, a dry fill will prove advantageous and economical

Grip-Tite Veneer (Masonry) Anchor

Grip-Tite Veneer Anchors and Anchor Strip are an improved means of tying brick, stone or terra cotta veneers to concrete columns and spandrel beams. They are so designed that veneers and concrete structure become a rigid and united mass minimizing bulging, cracking, and damage of veneers.

Advantages—Anchors can be adjusted up or down to exactly meet the course. This assures that every course will be properly tied and eliminates the guesswork of placing ties when concrete is poured—which method is usually inefficient and uncertain.



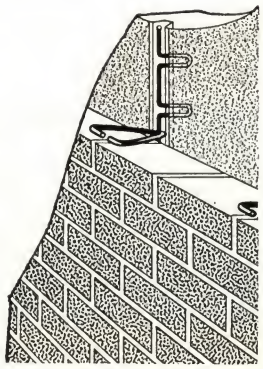
Installation—The Grip-Tite Veneer Anchor consists of an anchor strip which is simply tacked to the forms when concrete is poured, and special anchors for brick, stone or terra cotta which are fastened to the strip when masonry work is done. Installation is easy and foolproof. There are no holes to bore in forms, no measuring for course heights, and less expense in removing forms.

Installation with Stone or Terra Cotta

Specifications—Wherever brick, stone or terra cotta veneer occurs against concrete columns or spandrel beams, use "Grip-Tite" Anchor Strip and Veneer Anchors as manufactured by the MUNSON MANUFACTURING Co. of Winterset, Iowa, spacing same 12, 16, or 24 ins. (state which) on centers laterally.

For stone or terra cotta, use Special Stone or Terra Cotta Anchor in every joint.

For brick use Special Brick Anchor in every sixth or seventh course.



Installation with Brick

UNION STEEL PRODUCTS COMPANY

Steel Joist and Metal Lath Accessories

ALBION, MICH.

BRANCH OFFICES
CHICAGO, ILL., 1148 Builders' Building—Telephone, Randolph 6635 DETROIT, MICH., Penobscot Building—Telephone, Randolph 5500

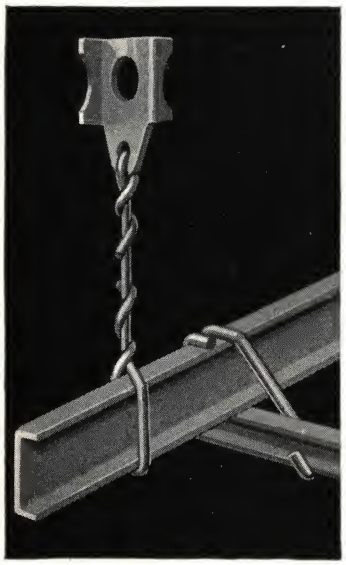
Products

CONCRETE INSERTS for SUSPENDED or ATTACHED CEILINGS; FURRING CLIPS; FURRING RODS; FURRING TIES; LATH CLIPS, etc. For Reinforcing Steel Accessories, see Manufacturers' Index.

Write for Complete Steel Joist and Metal Lath Catalogue.

Union Nailer Ceiling Insert for Suspended or Attached Ceilings Below Concrete Slabs

Suspended Ceiling—Drives into the forms like a nail and when forms are removed the driven blade with the hole in it is exposed to fasten the hanging wire. These inserts are as easily placed as a double-headed nail and yet they will suspend a load of 1000 lbs. when used with stone concrete. The hole in the insert is $\frac{5}{16}$ in. in diameter, therefore it will easily take up to a ¼-in. wire or rod. Made special with $\frac{7}{16}$-in. hole.



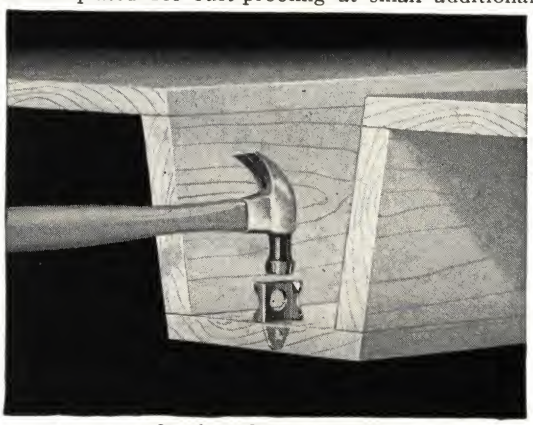
Suspended Ceiling Detail

Showing method of using Nailer Ceiling Insert and Channel Furring Tie to secure a strong solid ceiling

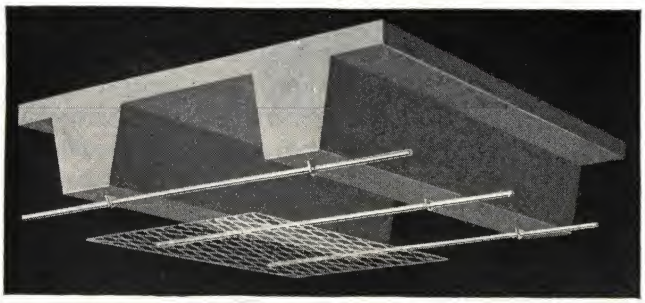
Attached Ceiling—A very economical and rigid attached ceiling may be secured by using the Nailer Ceiling insert in the bottom of concrete joists. Place these inserts every 16 ins. along the joist and line them up crosswise of the joists. When forms are removed, draw a pencil rod through the holes in the insert, then attach metal lath in the usual manner. This construction allows a suspension of ⅝ in. below the joist preventing joist streaks from weathering through the plaster. This also permits the use of flat lath instead of hi-rib. By this method a new and better ceiling construction is achieved—with the advantages of a suspended ceiling and the economy of an attached ceiling.

The Nailer Ceiling Insert may also be used to fur away from concrete walls. Drive the inserts into the wall forms from the inside, lined up vertically. When forms are removed insert pencil rods in the holes and attach lath.

The Nailer Ceiling Insert is made of 14-gauge hard steel. Can be cadmium plated for rust-proofing at small additional cost.



Simple as Driving a Nail



Advantages of a Suspended Ceiling—Economy of an Attached Ceiling

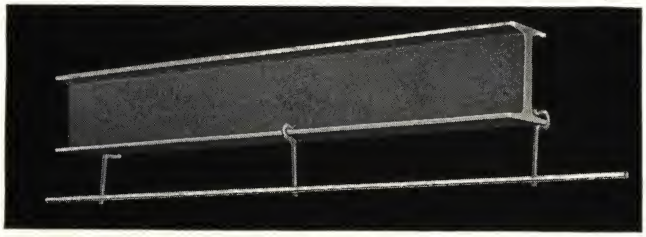
Union Continuous Suspended Furring Rod

For steel joist and Structural tie beams or channels.

The advantages of a suspended ceiling under steel joists are quite well known—such as, streaks in plaster eliminated, more fireproof, more soundproof, and provides greater ease in running conduit pipe, etc., below the joist. The suspended furring rod answers this suspended ceiling problem perfectly. Also very practical for suspending ceiling below structural tie beams.

The suspended furring rod is made of a ¼-in. pencil rod in 4-ft. lengths, with hanging wire or clips, with 1-in. to 36-in. suspensions welded on at every 16 ins. along its length. These clips are shaped so that they may be driven on the lower flange of the steel joist.

By driving these hangers on opposite edges of the joist flange, the longitudinal furring rod is sprung slightly so that it produces a tension to help hold the hanging wires on the joist flange, making it impossible for the suspended furring rod to ever come loose.

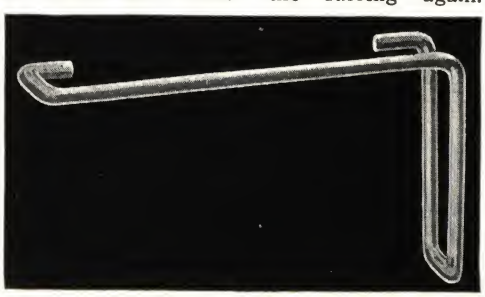


Suspended Furring Rod Is Made for Steel Joists and Structural Steel Beams and Channels

Union Channel Furring Tie

A quick and rigid method of tying furring channels to channel or angle runners. These ties are made similar to the bar ties that are used by the millions. With one motion and with one hand, the furring is tied to the runners. Take the tie in one hand, hook it under the furring channel, then bring the long arm of the tie over the runner and bend it down and under the furring again. Furring ties are faster than wire and assure rigid and uniform suspended ceilings.

Channel furring ties are made of No. 8 hard steel wire in all sizes. They can be made of galvanized wire for a slight additional cost.



Every Tie Uniformly Tight and Strong

UNIVERSAL FORM CLAMP COMPANY

Manufacturers of Concrete Accessories
977 Montana Street, CHICAGO, ILL.

Products

MASONRY ANCHOR SLOTS; BAR BOLSTERS; BAR SPACERS.

Also Continuous Sleeper Anchors, Form Clamps, Cone Nuts and other Concrete Accessories.

Masonry Anchors and Slots

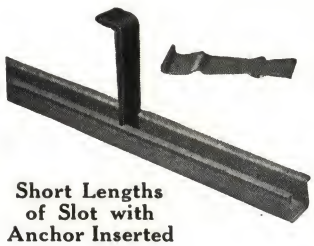
Use—Universal Anchor and Slot provides the modern method of tying brick, terra cotta, stone or tile to concrete. It provides a most substantial bond giving the highest possible degree of strength and safety and affords substantial economies in time and labor.

Advantages—Since the slot remains in the concrete it forms an integral part of the structure which can never work loose. Anchors may be inserted at any height and it is not necessary to bend or distort anchors to make them fit. Measuring course heights, boring and drilling of forms is eliminated, and a substantial time saving is made when forms are stripped. In addition, form costs are substantially reduced since forms are left unmarred by holes.

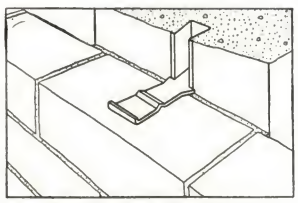
The Universal Anchor Slot has an extra wide flange which gives it complete freedom from distortion and prevents concrete from filling the slot. It is furnished in 10-ft. lengths.

Installation — The length of slot is cut the required length and nailed to the form with the open side down. When forms are stripped the slot remains in the concrete permitting the anchors to be inserted at any point as the masonry is built up.

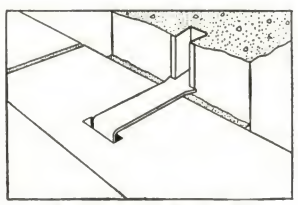
Specifications — Universal Anchor Slot as manufactured by the UNIVERSAL FORM CLAMP COMPANY, shall be installed vertically in all concrete columns, beams or walls which are to be faced with brick, terra cotta, or stone.



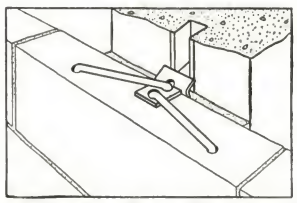
Short Lengths of Slot with Anchor Inserted



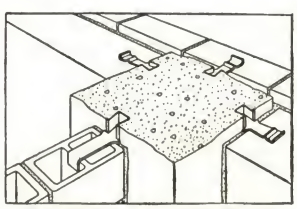
Anchoring Brick to Concrete
The anchor can be inserted at any height desired



Anchoring Stone to Concrete
A twist of the wrist puts the anchor in the slot at any course height



Anchoring Terra Cotta and Tile to Concrete
Two rods placed in holes in the anchor which may be inserted at any height hold the terra cotta or tile tightly to the concrete



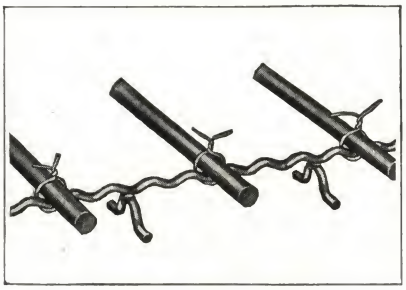
On Columns with Brick Facing
Anchors in columns with brick facing and tile partition showing the versatility of Universal Mortise Anchor and Slot

The contractor for concrete work shall furnish and install one slot in all columns up to 16 in. wide, and in wider columns, two or more slots shall be installed. Slots shall be installed in all beam faces and walls as required by the mason contractor.

The mason contractor shall furnish and install sufficient Universal Anchors to properly anchor masonry as approved by architects.

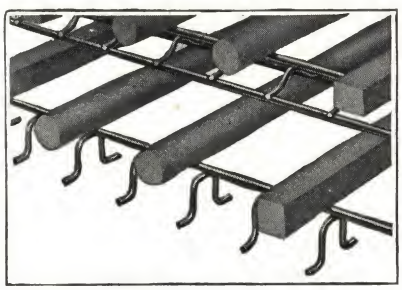
Slab Bar Bolster

This bolster is designed to avoid the inconvenience of prespaced devices. The corrugations 1 in. apart with welded legs 5 in. on center act as a guide to the steel setter and prevent the bars from slipping after wiring. This one type supports all slab steel regardless of spacing.



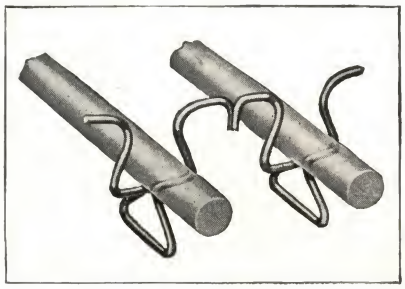
Beam Bar Bolster

This extremely strong beam bar bolster is cut to length on the job to fit individual beams. It is stocked in 5-ft. lengths. The welds are never in shear and carry no load. It properly supports the bars in any beam, regardless of spacing. Interference with flow of concrete is reduced to a minimum.



Spring Joist Bar Spacer

The joist spacer here illustrated meets every condition demanded in a self-locking device. Bars up to 1⅛ in. are locked in place after being pushed into the seat. The spring acts from the top to the very bottom of the spacer. Wide supporting legs are directly under the bars.



THE V-W VENTILATOR COMPANY

Tiger Floor Clips

ADams 3054

473 East Broad Street, COLUMBUS, OHIO

Tiger Floor Clip Features

Lowest Cost—The fact that Tiger Floor Clips are lower in price, netting a material saving on construction work, is a decided advantage.

Easily and Inexpensively Placed—Tiger Clips are easily and speedily placed in fresh concrete. Just shove in place and and that is all until time to place sleepers.

Set Flush—"Tigers" set flush with the surface of the concrete slab without obstruction during other phases of construction.

Cannot Loosen or Pull Out—Tiger Clips are guaranteed not to loosen or pull out. Examination of their construction will prove that they are built so as to become firmly embedded in the concrete. Tests have proven that they last as long as concrete.

Suggested Specification

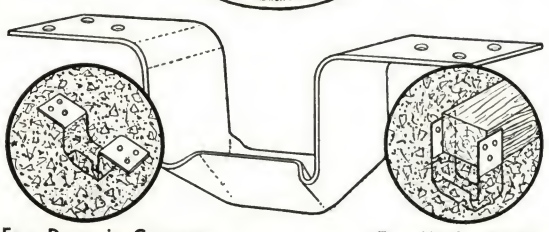
In concrete upon which wood flooring is to be built, before concrete has set, insert Tiger Floor Clips, manufactured by THE V-W VENTILATOR COMPANY, Columbus, Ohio. Clips are to be made of electro-zinc-coated No. 20 gauge metal, 1¼ in. wide; the two vertical members of the clip must be connected below the surface of the concrete so that clips cannot be loosened or pulled out after concrete has set.

Sleepers ..... in. wide by ..... in. high to be spaced ..... in. on center, clips to be spaced ..... in. on center along sleepers and staggered.

Other V-W Products

For V-W Built-in Ventilators and V-W Window Ventilators, see Manufacturers' Index

TRADE V-W MARK VENTILATOR THE V-W VENTILATOR CO. COLUMBUS O.



Ears Down in Concrete — Ears Up for Nailing

Placing Tiger Floor Clips

A simple guide can be made by using two planks, spaced 12 in. apart from left edge to left edge, and held by strips that extend 12 in. past the left edge of plank; 16-in. marks for placing are staggered on the two planks so that two rows can be laid simultaneously.

For spacing sleepers 16 in. on centers, space boards 16 in. from left edge to left edge and extend strip 16 in. past left edge. For 24-in. placing, mark the guide boards accordingly. See diagram below.

Quickly Placed with Paddle

Notice in diagram below how small paddle pushes "Tigers" easily into concrete.

Many contractors use pliers, holding the clip with the pliers at the narrow cup-like section, as they push it into the concrete.

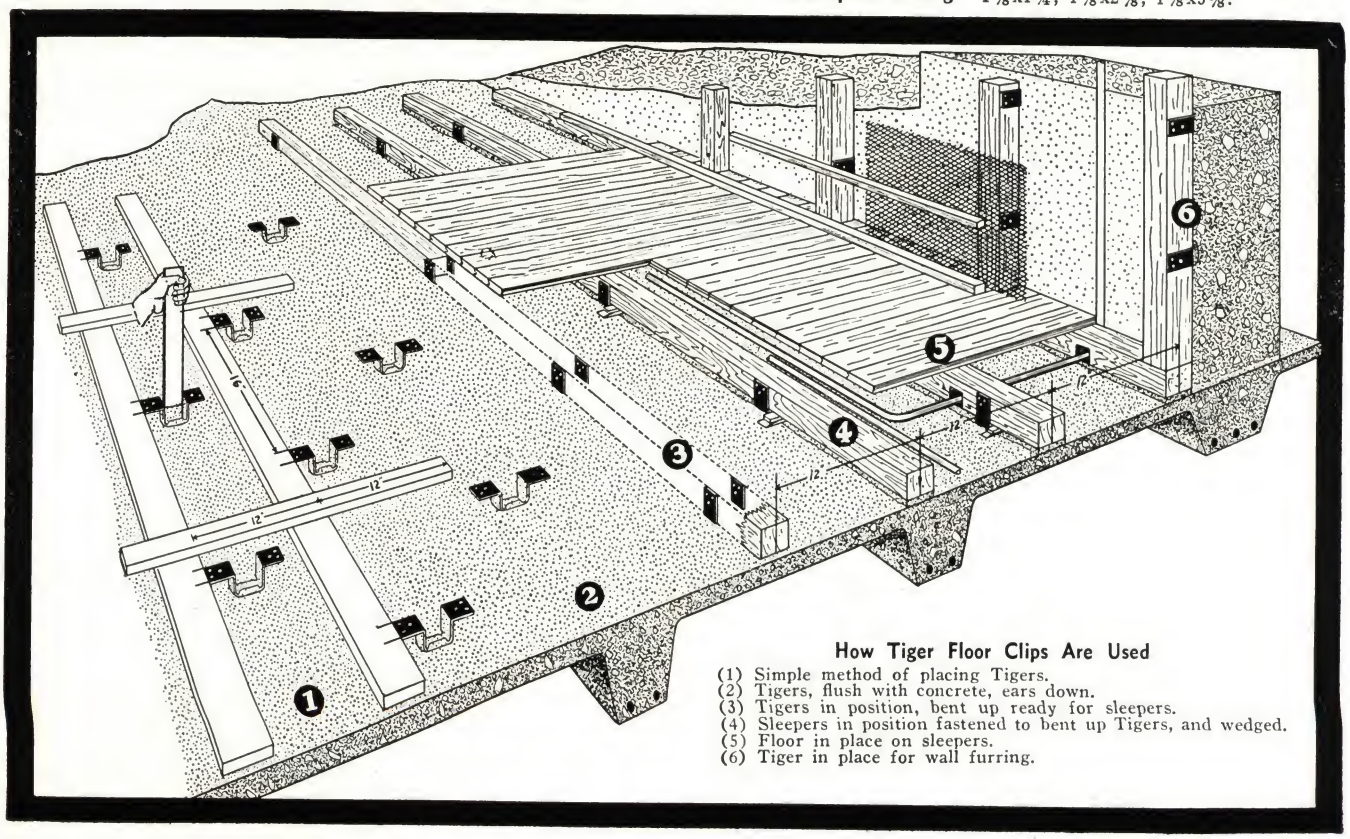
As paddle or pliers are removed, concrete flows in, filling the cup and securely holding the clip in place.

These methods are much speedier than by hand.

HOW TO CALCULATE THE NUMBER OF CLIPS REQUIRED

Sleeper spacing, in., o.c.	Clip spacing, in., o.c.	Number of clips per 1000 sq. ft.
12	16	800
16	16	600
12	24	550
16	20	500
16	24	400

Price—$25.00 per thousand.
Standard sleeper sizes, in.: 1⅝x1⅝, 1⅝x1¾, 1⅝x2⅝, 1⅝x3⅝.



How Tiger Floor Clips Are Used

(1) Simple method of placing Tigers.
(2) Tigers, flush with concrete, ears down.
(3) Tigers in position, bent up ready for sleepers.
(4) Sleepers in position fastened to bent up Tigers, and wedged.
(5) Floor in place on sleepers.
(6) Tiger in place for wall furring.

J. B. EURELL COMPANY

Gypsum Floor and Roof Construction

225 South Fifteenth Street, PHILADELPHIA, PA.

BRANCH OFFICES

RICHMOND, VA., 1223 Mutual Building

PHILLIPSBURG, N. J., 656 Columbus Avenue

Products

SUSPENSION SYSTEM, POURED-IN-PLACE GYPSUM FLOORS and ROOFS.

Description of the Suspension System

The suspension system and the formulæ used are based upon the simple principles of the suspension bridge. Cold drawn, twisted steel cables are laced across the floor or roof and are securely anchored at both ends to the wall purlins or beams. The cable spacing is such that the cables bear the entire designed load with a factor of safety of four. Steel transverse rods deflect the cables in the center of each arch and give them initial tension.

Advantages

Strength—Since the steel cables alone are considered, the gypsum being ignored, in calculating the strength of the slab, different commercial loads are taken care of by varying the cable spacing.

Light Weight—The suspension system gypsum slab weighs but 4½ lb. per sq. ft. per in. of thickness. Average floor slabs are 4 in. thick; average roof slabs are 3 to 3½ in. This weight, combined with beam spacings averaging 6 to 7 ft., produces remarkable savings in the amount of steel used in the building framework.

Speed of Construction—The wooden forms used in pouring the slab may be stripped one hour after pouring and the slab will be capable of bearing the full designed strength. Practical construction men can appreciate what this means in the way of rapidity of construction.

Fire Resistance—Numerous official tests have demonstrated that a gypsum slab will resist intense fires for long periods and not only effectually prevent the spreading of the fire, but also suffer but small damage to itself, which is easily repaired.

Heat Insulation—As a heat insulator, gypsum is more than three times as effective as stone or cinder concrete. No other fireproof material is nearly as effective as a heat insulator. This means saving in heating plant investment and in fuel bills. It also means freedom from condensation drip from the underside of roof slabs.

Durability—Suspension type gypsum roofs installed over thirty years ago are in a condition equal to that of the day they were installed.

Other Advantages—In addition, gypsum suspension slabs are elastic and free from expansion or contraction strains. Gypsum slabs lend themselves readily to alterations, such as cutting holes for stairways. Gypsum is also a sound-deadening material.

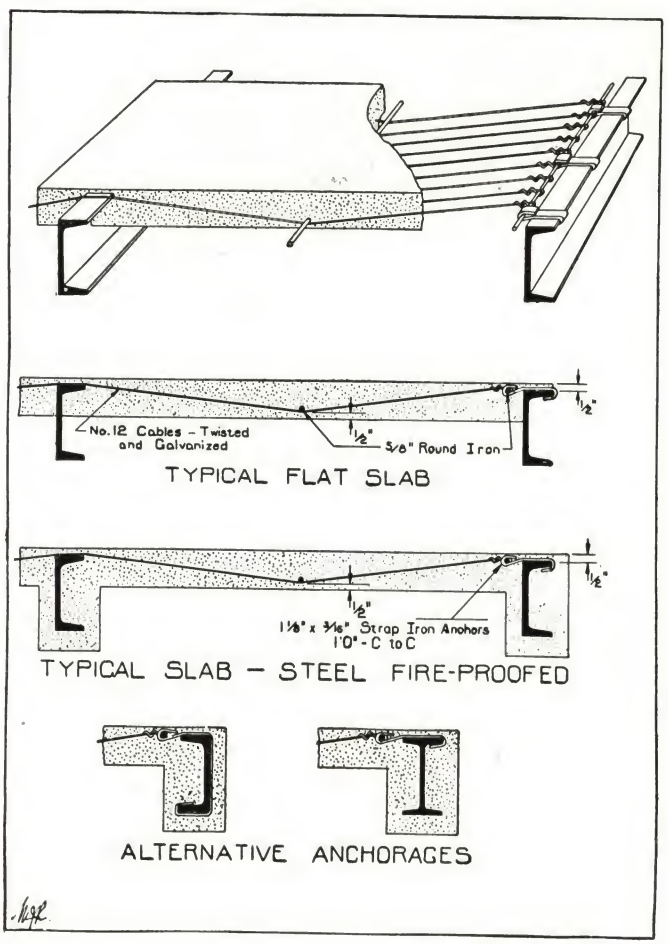


TABLE OF TOTAL LOADS
FLOOR AND ROOF CONSTRUCTION
SUSPENSION TYPE

Unit Working Stress = 20,000 Lbs. per Sq. In. for Steel
Cables Composed of 2 No. 12 Cold Drawn Galvanized Steel Wires Twisted
Cable Tension = $T = 2 \times .00874 \times 20{,}000$ lbs. = 350 lbs./Cable.

$$W = \frac{1152Td}{bL\sqrt{L^2+16d^2}}$$

W = Total Safe Load, Lbs./Sq. Ft.
d = Deflection of Wires, Ins.
b = Cable Spacing, Ins.
L = Clear Span, Ins.

	Slab thickness inches	Cable spacing inches	Clear Distance Between Flanges of Beams													
			3′-6″	4′-0″	4′-6″	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	8′-6″	9′-0″	9′6″	10′0″
Roofs Only	3	1	450	345	273	221	183	154	131	114						
		1¼	360	276	218	177	147	124	105	91						
		1½	301	230	182	147	123	103	88	76						
		1¾	258	197	156	126	104	88	75	65						
		2	225	172	137	110	92	77	65	57			←Roofs only→			
		2¼	200	153	122	99	82	68	58	51						
		2½	180	138	109	88	74	61	53	46						
		2¾	164	125	100	80	67	57	48	41						
	d = 2	3	150	115	91	74	61	52	44	38						
	3½	1	556	430	340	275	227	193	165	141	124	109	96			
		1¼	445	343	272	220	182	154	132	113	99	87	77			
		1½	370	285	226	184	152	128	110	95	82	73	64			
		1¾	317	245	192	155	130	110	94	82	71	62	55			
		2	278	215	169	138	114	96	82	71	61	55	48			
		2¼	247	191	150	123	102	85	73	63	54	49	42			
		2½	222	171	136	110	91	77	66	57	50	44	38			
		2¾	202	155	124	101	83	70	59	52	45	39	35			
	d = 2½	3	185	143	113	92	76	64	55	47	41	36	32			
Floors and Roofs	4	1	658	508	403	330	270	230	195	169	148	129	115	102	93	83
		1¼	527	406	322	264	216	184	156	135	118	103	91	82	75	67
		1½	438	338	268	220	180	153	130	112	98	86	77	69	62	56
		1¾	376	290	230	188	154	131	111	97	84	74	66	59	53	48
		2	328	254	201	165	135	115	98	84	74	64	57	52	46	41
		2¼	292	226	178	147	120	102	87	75	65	57	51	46	41	37
		2½	264	203	165	131	108	91	78	67	58	52	46	41	37	34
		2¾	240	185	147	120	98	83	71	61	54	47	42	37	34	31
	d = 3	3	219	169	134	110	90	77	65	57	49	43	38	35	31	28
	4½	1	757	583	466	382	313	264	226	195	172	150	134	120	107	97
		1¼	605	467	373	305	251	212	181	155	137	121	107	96	86	78
		1½	505	389	310	255	209	177	150	130	114	101	89	79	72	64
		1¾	432	334	266	218	179	151	129	111	98	86	77	69	61	56
		2	378	292	233	190	157	132	113	97	85	76	67	60	54	48
		2¼	336	260	207	169	140	118	101	86	76	67	59	54	48	43
		2½	303	234	186	152	126	106	90	78	68	60	54	48	43	38
		2¾	275	213	170	139	114	96	82	71	62	56	49	43	39	35
	d = 3½	3	252	194	155	127	104	88	75	65	57	50	45	40	35	32
	5	1	853	660	528	433	358	302	259	224	196	173	153	136	122	111
		1¼	682	528	423	347	286	242	207	179	156	138	123	109	98	89
		1½	569	441	352	288	239	201	172	150	130	115	102	91	81	74
		1¾	487	378	302	247	205	172	147	128	111	98	87	78	70	63
		2	427	330	264	216	179	151	129	112	98	86	77	68	61	56
		2¼	380	294	235	193	159	134	115	100	86	77	68	60	55	50
		2½	341	265	212	173	144	120	104	90	78	69	61	55	49	44
		2¾	310	241	192	157	130	109	94	82	71	62	56	50	45	40
	d = 4	3	284	220	176	144	120	101	86	75	65	58	51	45	41	37
	5½	1	944	738	592	483	402	340	290	252	220	193	171	153	138	125
	6	1	1032	807	648	531	442	374	321	278	243	214	190	170	153	138

Specification

The floor [roof] construction shall be Poured-in-place, Suspension System, Gypsum Slab. No. 12, cold drawn, twisted steel cables shall be laid over the tops of the beams [purlins] and secured to the wall beams [end purlins] by means of strong strap anchors and anchorage rods. These cables shall be laid parallel .... inches apart (see table) and shall be tied down in the center of each arch by means of iron rods running parallel to the structural beams. The wooden forms shall be placed so that they are ½ in. below the cables at the point of greatest deflection. Gypsum concrete, composed of calcined gypsum and not more than 12% by weight of soft wood chips, shall be poured-in-place and be troweled to an even surface ½ in. above the tops of the beams [purlins], ready to receive the sleeper fill [grading] [waterproofing] [slate] [tile]. The slab shall carry the specified live load of .... pounds per square foot with a factor of safety of 4.

Some Recent Installations

United States Bureau of Standards, Washington, D. C.
War Department, United States Government
Bethlehem Steel Company, Inc., Bethlehem, Pa.
Baldwin Locomotive Works, Eddystone, Pa.
Pennsylvania Railroad Company, Philadelphia, Pa.
Ingersoll-Rand Company, Phillipsburg, N. J.
Atmospheric Nitrogen Company, Hopewell, Va.
Convention Hall, Philadelphia, Pa., Philip H. Johnson, Architect
Autocar Co., Philadelphia, Pa., Ballinger Co., Architects
Philadelphia Rapid Transit Company, Philadelphia, Pa.
University of Pennsylvania, Philadelphia, Pa., Gravell & Duncan, Engineers
Scottish Rite Temple, Baltimore, Md., Clyde N. & Nelson Friz, Architects
Johns-Hopkins Hospital, Baltimore, Md.

KEYSTONE GYPSUM FIREPROOFING CORPORATION

Marbridge Building, 34th Street and Broadway
NEW YORK, N. Y.

BRANCH OFFICES

BOSTON, MASS., 8 Beacon Street
PHILADELPHIA, PA., North American Building
QUEBEC, QUE., 140 St. John Street
MONTREAL, QUE., 306 New Birks Building
WASHINGTON, D. C., 2525 Pennsylvania Avenue, N. W.

Products

The erection of the METROPOLITAN SYSTEM of GYPSUM FIREPROOF FLOOR and ROOF CONSTRUCTION.

Metropolitan System of Gypsum Fireproof Floor and Roof Construction

The principle of this system is that of the suspension bridge. It is a gypsum slab poured in place on parallel and uniformly spaced cables, the ends of the cables securely and rigidly anchored to the frame of the building. Enough cables are put in to carry the total load, with a factor of safety of 4, without regard to the compression value of the Metropolitan composition.

The composition is 87½% calcined gypsum, and 12½% wood planer chips.

The practical advantages of the system have been demonstrated over a period of forty years in hundreds of installations throughout the United States and Canada, under a wide extreme of climatic conditions.

Meritorious Features of the Metropolitan System

Safety and Strength—The metal construction makes the Metropolitan system one of the safest types of roof and floor construction. Stresses are calculated by approved engineering formulae. The cables carry all the load. The Metropolitan composition is used merely to protect the wires and structural framework against fire and corrosion and to distribute the load.

Economy of First Cost Due to Light Weight and Rapidity of Construction—Metropolitan composition weighs less than 5 lb. per sq. ft. per inch of thickness. For floors minimum thickness is 3½ in.; for roofs, 3 in. The light weight permits lighter beams and wide spacing, thus saving tons of steel. This feature makes it particularly advantageous in additional story work. In existing structures, this extreme lightness permits the replacing of less sturdy floors without either strengthening existing frames or overloading them.

The fact that Metropolitan gypsum composition sets within 30 minutes after the slab is poured, and forms can be dropped within 60 minutes, leaving slab good for calculated loads, makes for rapid construction—a prime factor in construction economy. The Swarthmore Apartments in Philadelphia, Pa., stand as a monument to the speed with which the system may be installed. This job was put up, 12 floors and roof, in fourteen working days.

Non-conductivity, Insulation and Fire Resistance—The high insulating value of Metropolitan gypsum composition as a roof material effects a saving in cost of the heating plant. Condensation of moisture on the undersurface is eliminated.

It is a fire resistant of the highest quality. Complete reports of fire tests conducted for the New York and Toronto building bureaus gladly furnished.

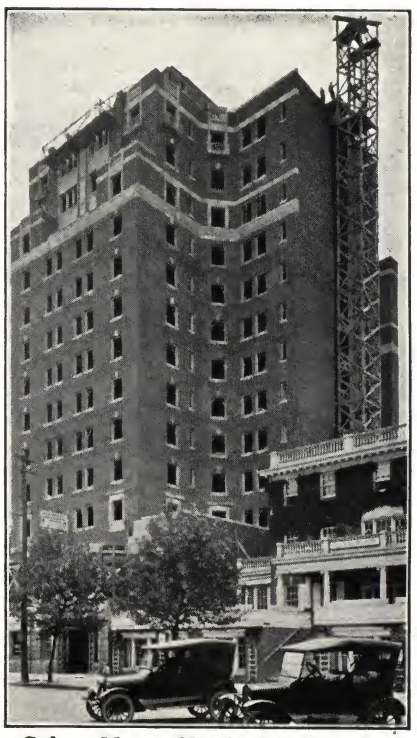
Sound Deadener—Gypsum has excellent sound deadening properties. In the Metropolitan composition full advantage is taken of this characteristic.

Durability—Metropolitan floors and roofs have been in active service, under severe conditions, for nearly forty years and are today, without exception, in as good a condition as when installed. Frequently sections have been cut out of Metropolitan floors which have been installed for many years, and in every case, the embedded beams and girders, as well as the steel cables, have been found in perfect condition.

Low Maintenance—Elasticity is necessary to good roof and floor construction. Shocks, vibrations and unequal stresses are likely to crack an inelastic construction. The wood filler in the Metropolitan composition provides elasticity and Metropolitan roofs and floors remain intact under the severest conditions, thus eliminating the annoyance and expense of constant repairs.

Service—This company contracts for entire installation of both floor and roof arches. They regard each contract as a sale of service in addition to sale of material and workmanship. Nor is delivery of service completed with acceptance of contract. It is a service, in other words, rendered not only *during* the work but *before* and *after* its execution.

Guaranteed Construction—The KEYSTONE GYPSUM FIREPROOFING CORPORATION guarantees every square foot of floor or roof construction they install against failure from any cause, under the conditions for which it was designed.



Colton Manor Hotel, Atlantic City, N. J.
Twelve Metropolitan floors and roof

Where the Metropolitan System Is Used

The Metropolitan system is in thoroughly satisfactory use in innumerable hotels, clubs, schools, hospitals, churches, apartment houses, theatres, office buildings, power plants, paper mills, machine shops, garages and manufacturing buildings.

Information for Designing

Services of Engineering Department—Our Engineering Department should be consulted before steel design of building is completed. We will gladly send our engineers to confer with you without expense or obligation.

Economical Spans—The construction can be installed between supports spaced up to 9 ft. in clear. Our experience has shown that under average conditions a spacing of 6 ft. 6 in. to 7 ft. is the most economical.

Waterproof Roofing—Any standard type of waterproof roofing may be successfully applied to our metropolitan system. The form most generally applied, however, is a 3-ply built-up roofing.

Specifications

Fireproof Floors and Roofs—After forms or centers have been placed in proper position, cables, each composed of two No. 12 (or equivalent) galvanized wires twisted, shall be carried over the tops of the beams or purlins to outside wall beams or end purlins and be secured to them by strong hooks or anchors. These cables shall be laid parallel, 1 to 3 in. apart, according to spans and loads, and shall pass under round iron bars, midway between the purlins, so as to cause the cables to deflect uniformly. The Metropolitan composition shall then be poured-in-place, and brought to an even surface about ½ in. above the top of the beams, forming a slab ready to receive [sleeper fill or grading] [finished roofing or grading] and with the underside left as smooth as practicable. The slab shall be designed to carry safely the live load with a factor of safety of 4.

Note: For fireproof floors, fireproofing beams and girders (not trusses) shall be used, according to the local building laws.

Cables composed of 2-No.12 Cold Drawn Galvanized Steel Wires Twisted

Cable = 2 x .00874 @ 20000#/□" = 350#

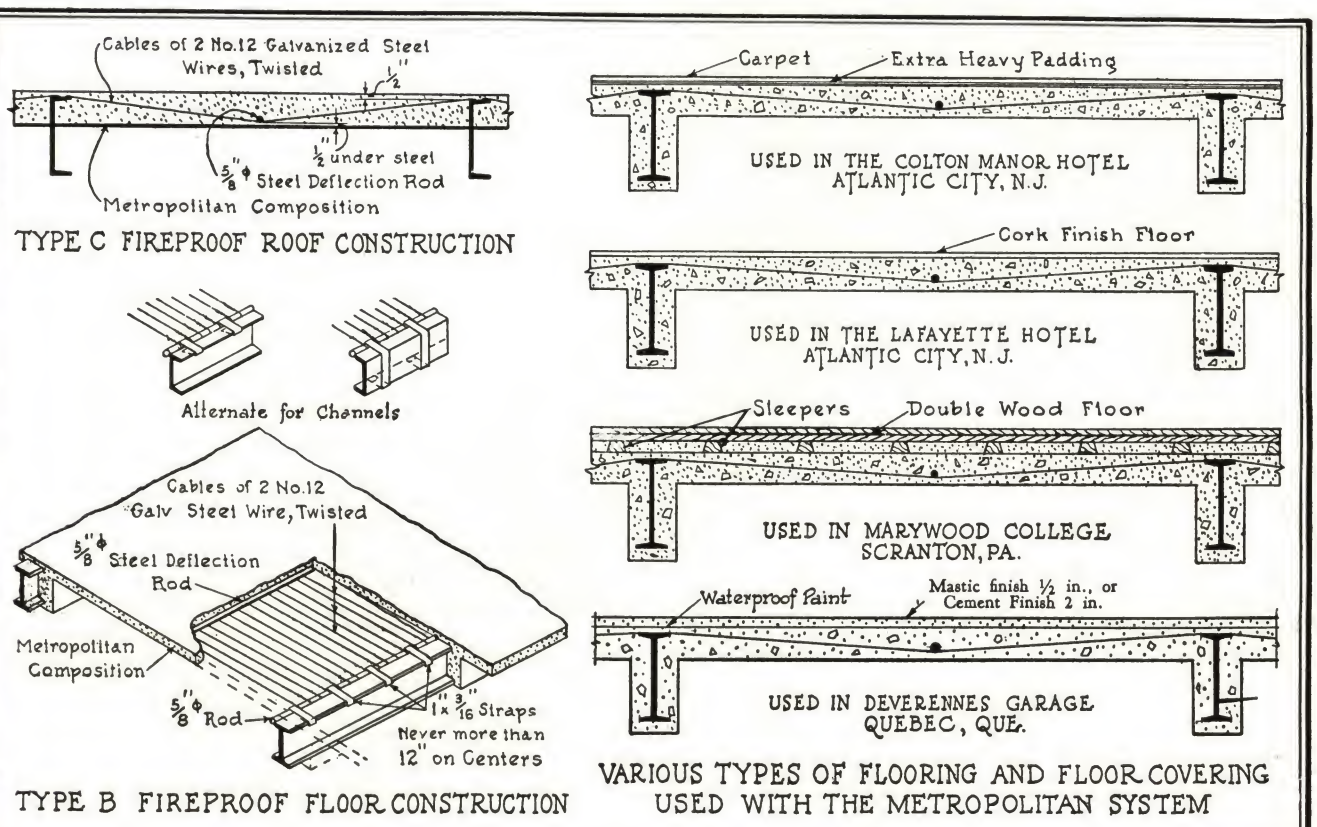
$W = \frac{1152\,Td}{bLYI^2 + 16d^2}$ — 20000#/□" — NO. 12.

ROOFS

SLAB THICKNESS	CABLE SPACING	CLEAR DISTANCE BETWEEN FLANGES OF BEAMS 3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"
3	1	450	345	273	221	183	154	131	114						
	1¼	360	276	218	177	147	124	105	91						
	1½	301	230	182	147	123	103	88	76						
	1¾	258	197	156	126	104	88	75	65						
	2	225	172	137	110	92	77	65	57						
	2¼	200	153	122	99	82	68	58	51						
	2½	180	138	109	88	74	61	53	46						
	2¾	164	125	100	80	67	57	48	41						
	3	150	115	91	74	61	52	44	38						
3½	1	556	430	340	275	227	193	165	141	124	109	96			
	1¼	448	343	272	220	182	154	132	113	99	87	77			
	1½	370	285	226	184	152	128	110	95	82	73	64			
	1¾	317	245	192	155	130	110	94	82	71	62	55			
	2	278	215	169	138	114	96	82	71	61	55	48			
	2¼	247	191	150	123	102	85	73	63	54	49	42			
	2½	222	171	136	110	91	77	66	57	50	44	38			
	2¾	202	155	124	101	83	70	59	52	45	39	35			
	3	185	143	113	92	76	64	55	47	41	36	32			

FLOORS — ROOFS

SLAB THICKNESS	CABLE SPACING	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"
4	1	658	508	403	330	270	230	195	169	148	129	115	102	93	83
	1¼	527	406	322	264	216	184	156	135	118	103	91	82	75	67
	1½	438	338	268	220	180	153	130	112	98	86	77	69	62	56
	1¾	376	290	230	188	154	131	111	97	84	74	66	59	53	48
	2	328	254	201	165	135	115	98	84	74	64	57	52	46	41
	2¼	292	226	178	147	120	102	87	75	65	57	51	46	41	37
	2½	264	203	165	131	108	91	78	67	58	52	46	41	37	34
	2¾	240	185	147	120	98	83	71	61	54	47	42	37	34	31
	3	219	169	134	110	90	77	65	57	49	43	38	35	31	28
4½	1	757	583	466	382	313	264	226	195	172	150	134	120	107	97
	1¼	605	467	373	305	251	212	181	155	137	121	107	96	86	78
	1½	505	389	310	255	209	177	150	130	114	101	89	79	72	64
	1¾	432	334	266	218	179	151	129	111	98	86	77	69	61	56
	2	378	292	233	190	157	132	113	97	85	76	67	60	54	48
	2¼	336	260	207	169	140	118	101	86	76	67	59	54	48	43
	2½	303	234	186	152	126	106	90	78	68	60	54	48	43	38
	2¾	275	213	170	139	114	96	82	71	62	56	49	43	39	35
	3	252	194	155	127	104	88	75	65	57	50	45	40	35	32
5	1	853	660	528	433	358	302	259	224	196	173	153	136	122	111
	1¼	682	528	423	347	286	242	207	179	156	138	123	109	98	89
	1½	569	441	352	288	239	201	172	150	130	115	102	91	81	74
	1¾	487	378	302	247	205	172	147	128	111	98	87	78	70	63
	2	427	330	264	216	179	151	129	112	98	86	77	68	61	56
	2¼	380	294	235	193	159	134	115	100	86	77	68	60	55	50
	2½	341	265	212	173	144	120	104	90	78	69	61	55	49	44
	2¾	310	241	192	157	130	109	94	82	71	62	56	50	45	40
	3	284	220	176	144	120	101	86	75	65	58	51	45	41	37
5½	1	944	738	592	483	402	340	290	252	220	193	171	153	138	125
6	1	1032	807	648	531	442	374	321	278	243	214	190	170	153	138



DETAILS SHOWING ADAPTABILITY OF THE METROPOLITAN SYSTEM

A Few Representative Installations of the Metropolitan System

State Office Building, Richmond, Va.
Richmond Trust Co., Richmond, Va.
Marywood College, Scranton, Pa.
Title Guarantee and Trust Co., New York, N. Y.
42 Broadway Building, New York, N. Y.
60 Wall Building, New York, N. Y.
Colton Manor Hotel, Atlantic City, N. J.
Lafayette Hotel, Atlantic City, N. J.
Levin Apartment Hotel, Atlantic City, N. J.
Thalheimer Store, Richmond, Va.
Sauvegarde Life Insurance Building, Montreal, Que.
Technical High School, Toronto, Ont.
Elks Club, Scranton, Pa.
Germantown Hospital, Germantown, Pa.
Overbrook Apartments, Overbrook, Pa.
Corcoran Art Gallery, Washington, D. C.
General Electric Building, Buffalo, N. Y.
Wesleyan Building, Boston, Mass.

LATHROP-HOGE GYPSUM CONSTRUCTION CO.

Gypsum Floors and Roofs

Neave Building, CINCINNATI, OHIO

BRANCH OFFICES

CHICAGO, ILL., 105 West Monroe Street
PITTSBURGH, PA., 615 Fulton Building
PHILADELPHIA, PA., 1700 Sansom Street
DETROIT, MICH., 439 Penobscot Building
NEW YORK, N. Y., 347 Madison Avenue

Products

MONOLITHIC GYPSUM FLOOR and ROOF CONSTRUCTION:

Standard Suspension Type.

Hoge Rail Type (U. S. Patent 1464711; Canadian Patent 241477).

Enclosed Rail Type (U. S. Patents 1721393, 1814387; Canadian Patent 254632).

Preformed Rail Type Floor and Roof Slabs (U. S. Patent 1688723).

Construction Service

This company, backed by over 15 years' experience in gypsum construction, is at your service for advice and estimates for the above types of construction installed complete in any part of the world.

Advantages of Rail Types

The rail types of construction have all the advantages of light weight, rapid erection, high insulation properties, fire resistance, vibration resistance, permanence, strength and excellent undersurface appearance.

The simplicity of the rail designs permits adaptation to any layout of supports by varying the size of rails in accordance with standard structural design. Rails bear on walls and no special bracing of purlins is required as with other designs.

In replacement of old roofs and floors where applications to framing are difficult, or where a uniform paneled undersurface is desired, its use has been found particularly advantageous.

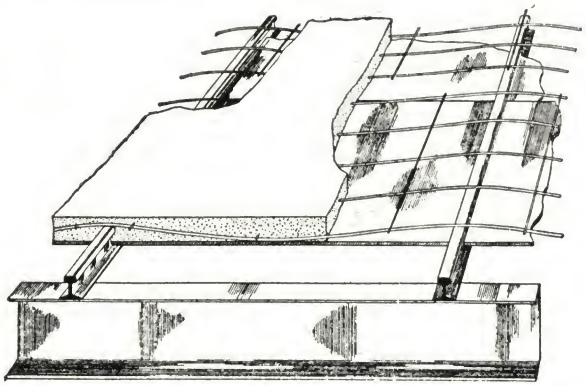
Rail Type of Monolithic Gypsum Floor and Roof Construction

The Standard Suspension type of gypsum slab construction was the only type of poured-in-place or monolithic roof and floor slab construction extensively used until the rail types were originated and developed by this company a few years ago.

Specifications and list of representative installations of the Standard Suspension type of construction sent on request.

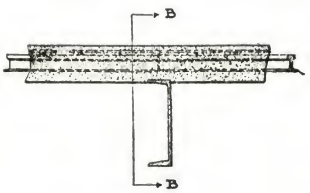
While this company is prepared to install the Suspension type where specified or on rare occasions where it fits special conditions, the approval of architects, engineers, and owners throughout the United States and Canada is convincing proof that the Hoge and the Enclosed Rail Types are well suited to the great majority of conditions, and conform readily to the standards of design and appearance required by architects.

Hoge Rail Type—In the Hoge Type small A.S.C.E. rail sections are laid about 32 in. apart on the top of walls, beams or purlins spanning the distance between beam or wall supports. On the lower flanges of the rails are supported ⅜-in. standard gypsum board, Celotex or other composition board, with joints made over purlins to form a solid undersurface, paneled by the lower flanges of the rails. The rails are designed to carry all loads, which are transferred to them by continuous mesh reinforcement running across and resting over top of the rails. Standard gypsum composition is poured in place over the gypsum board or Celotex, and finished smooth to the required slab thickness, ready to receive the roof or floor finish. The undersurface can be left with the attractive composition board finish or may be decorated as desired.

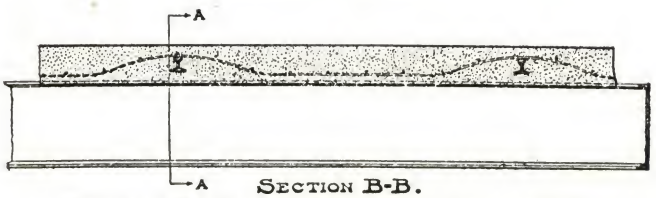


Hoge Type of Monolithic Gypsum Floor and Roof Construction

Enclosed Rail Type—Where fireproofing or greater insulation value is desired, the rails are supported on the purlins or blocked above the top of purlins with insulating material. Removable forms are so placed as to permit covering the bottom of the rails with ¾ in. or more of gypsum composition, leaving a solid, plain gypsum undersurface even with the top of the purlins, the full thickness of the slab being above the superstructure, yielding maximum insulation value.



SECTION A-A.



SECTION B-B.

Details of Enclosed Rail Monolithic Gypsum Slab Construction

Specifications for Monolithic Gypsum Floor and Roof Construction

Hoge Type—The floors and roofs named herein shall be the Hoge Type Monolithic Gypsum Board and Rail Construction as furnished by the LATHROP-HOGE GYPSUM CONSTRUCTION Co., Cincinnati, Ohio.

Standard rail sections designed to carry all loads between supports shall be laid on the top of walls, beams, or roof purlins at sufficient spacing to receive ⅜-in. standard gypsum board carried on the lower flanges; gypsum board shall be butted tightly to form an even undersurface and braced in place if necessary to prevent buckling; galvanized mesh reinforcement of a minimum area per foot of the slab cross section of .026 in. shall be stretched over the tops of rails and allowed to sag to near the top of gypsum board, forming a continuous reinforcement at right angles to the direction of the rails.

Standard gypsum composition containing at least 85% calcined gypsum shall be mixed with water to a medium quaking consistency and poured into place, forming a solid reinforced slab 2½ in. thick, including the gypsum board. The top surface of slab shall be left ready to receive the finish desired, such as fill, grading or waterproofing.

Overhangs in direction of span of rails shall be formed by extending same to required distance beyond the last purlin. Other overhangs shall be reinforced on the cantilever principle with reinforcement embedded in the adjacent main slab and secured to the steel of the same.

Curbs, walls, mullions, etc., shall be constructed with gypsum board facing and gypsum composition poured or plastered to regular thickness on the outer surface; or such curbs, walls, mullions, etc., may be constructed of precast gypsum blocks, all joints to be struck and outer surfaces on roofs left ready for waterproofing or other finish.

Note: The words Celotex or other composition board may be substituted for Gypsum Board in the above specification when this type of undersurface is desired.

Enclosed Rail Type—The floors and roofs named herein shall be the Enclosed Rail Monolithic Gypsum Slab Construction as furnished by the LATHROP-HOGE GYPSUM CONSTRUCTION Co., Cincinnati, Ohio.

Standard rail sections designed to carry all loads between supports shall be set on walls, beams, or roof purlins at proper elevation to provide at least ¾-in. covering of gypsum under their bottom flange. Across these rails shall be stretched galvanized mesh reinforcement, having .026 in. minimum area per foot of slab cross section, and allowed to sag to within ¾-in. of temporary wood or other forms, making a continuous reinforcement at right angles to the rail subpurlins.

Standard gypsum composition containing at least 85% calcined gypsum shall be mixed with water to a medium quaking consistency, and poured into place on the forms, completely enclosing the rails to form a slab 3 in. thick (or more where specified). The top surface of slab shall be left ready to receive the finish desired, such as fill, grading, or waterproofing.

Overhangs in direction of span of rails shall be formed by extending same to required distance beyond the last purlin. Other overhangs shall be reinforced on the cantilever principle, with reinforcement embedded in the adjacent main slab and secured to the steel of the same.

Curbs, walls, mullions, etc., shall be constructed with gypsum composition as above, sufficient steel reinforcement being provided to stiffen against wind pressure or other loading. Or such curbs, walls, mullions, etc., may be constructed of gypsum composition blocks laid up in gypsum mortar, all joints to be struck, and outer surfaces on roofs left ready for waterproofing.

Typical Installations

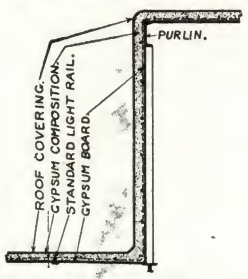
Hoge Type

INSTALLATION	SQ. FT.
John Van Realty Co., Cincinnati, Ohio	130,000
Clinchfield Railroad Co., Erwin, Tenn.	93,000
Pullman Car Co., Pullman, Ill.	300,000
J. P. Devine Mfg. Co., Mt. Vernon, Ill.	90,000
Bessemer Gas Engine Co., Grove City, Pa.	44,000
Fraser Co., Ltd., Madawaska, Me.	240,000
White Motor Co., San Francisco, Calif.	35,000
Coshocton Iron Co., Monongahela, Pa.	75,000

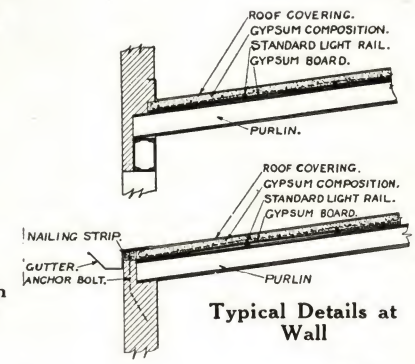
Installations of the Hoge type may be seen in every section of the United States.

Enclosed Rail Type

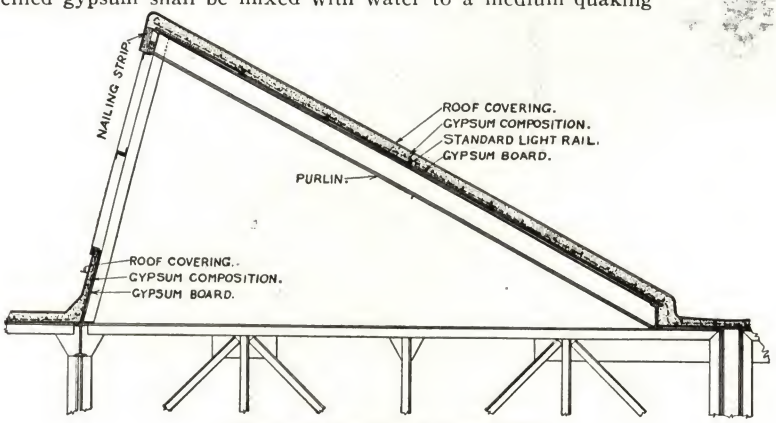
Port Alfred Pulp & Paper Co., Port Alfred, Que.	135,000
Newfoundland Power & Paper Co., Corner Brook, N. F.	43,000
Southern International Paper Co., Bastrop, La.	98,000
Southern International Paper Co., Camden, Ark.	85,000
Southern Kraft Corp., Panama City, Fla.	210,000
United Paperboard Co., Lockport, N. Y.	46,000
E. B. Eddy Co., Hull, Que.	35,000



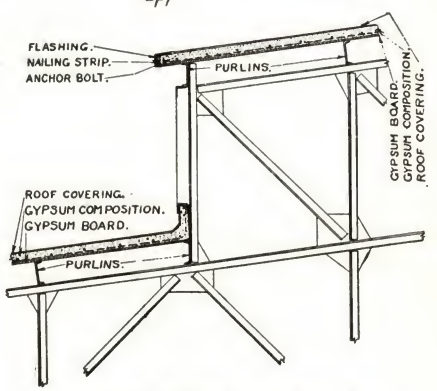
Typical Section Through End Wall of Sawtooth



Typical Details at Wall



Typical Sawtooth Construction

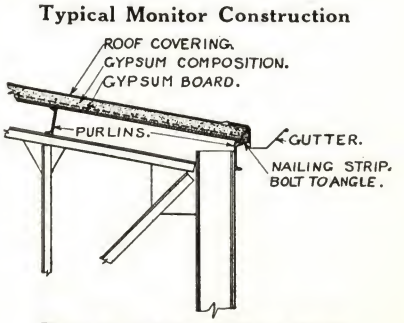


Typical Monitor Construction

SAFE LOAD FOR RAIL TYPE SLABS

Rails 32" o.c. $S = 18000$ lb per sq. in. $M = \frac{WL}{10} = SI/X$ For Rail Spacing of 24" Multiply Table Values by 4/3 For Rail Spacing of 36" Multiply Table Values by 9/9

SPAN / RAIL SECTION	4'0	4'6	5'0	5'6	6'0	6'6	7'0	7'6	8'0	8'6	9'0	9'6	10'0	10'6	11'0	11'6	12'0	12'6	13'0	13'6	14'0	14'6	15'0	15'6	16'0
8#	119	94	77	63	53	46	39							Slab Weight 12 lb per sq. ft											
12#			153	126	107	90	78	68	60	53	47	40													
16#					167	141	122	107	93	83	74	67	60	55	49	44									
20#	Slab Weight = 14 #/a'				197	169	148	130	115	103	91	83	76	69	63	58	54	50	46						
25#	Slab Weight = 15 #/a'						186	164	144	130	115	106	97	87	79	72	67	62	58	54	50	47			
30#	Slab Weight = 16 #/a'									192	165	150	137	124	113	105	97	89	82	76	71	66	62	59	



Typical Details of Eave Purlin

CASTONE PRODUCTS COMPANY

Manufacturers of "Castone" Roofing Tile
29th Street at B Avenue
CEDAR RAPIDS, IOWA

Products

"CASTONE" ROOFING TILE for commercial and public buildings and residences, including Channel Flat, Interlocking, Spanish, French and Single Tile types.

Also "Castone" Ornamental Building Trim and "Metal Crafters" Ornamental Iron Work.

"Castone" Tile

All "Castone" Tile are of one thickness regardless of span. This outstanding feature simplifies the structural steel layout, eliminating the necessity of placing purlins at two different elevations where the spans vary in length. Ordinarily a roofing tile would require a greater depth to assure greater strength where a longer span was used. "Castone" obtains this required strength through added reinforcement, leaving the depth of the tile constant.

Estimates and Proposals Furnished

"Castone" Engineers will be glad to go over your blue prints and advise what savings in your structural sheet can be made through the use of "Castone" Roofing Tile. They will prepare for you a revised layout of roof purlins for the new arrangement. Recommendations will be made as to the length that will meet the load-carrying requirements and complete specifications and cost estimates will be submitted.

DESCRIPTION OF "CASTONE" CHANNEL TILE

Made of either light weight or concrete aggregate, weighing from 12 to 27 lbs. per sq. ft. The tile are laid directly on steel purlins usually spaced not to exceed 8 ft. on centers. Can be installed any season of the year regardless of weather, so long as the supporting steel is not encrusted with ice.

The tile being of uniform thickness, regardless of length, allows the purlins to be fabricated at a uniform height. This simplifies the structural steel layout.

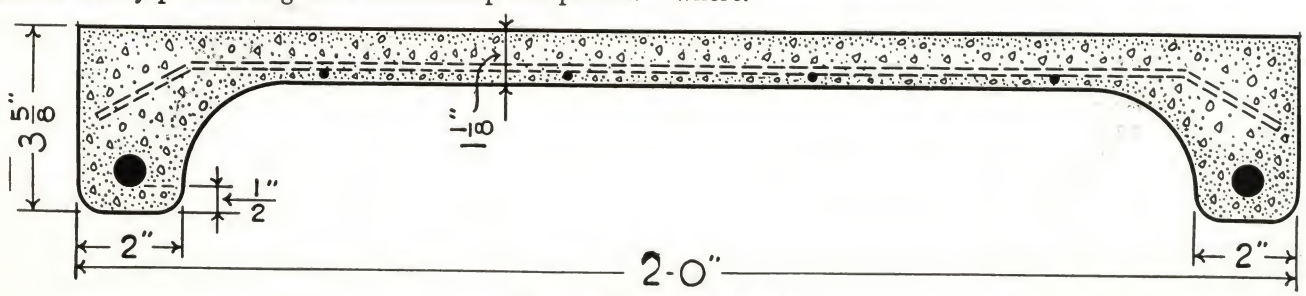
The ceiling finish presents a bone white surface and, where tile are left exposed, need not be painted unless desired.

We also furnish channel tile with closed ends which form a complete panel. This type adds greatly to appearance of ceilings which are to be left exposed.

A Test Load for "Castone" Channel Tile
It is not unusual for "Castone" roofing tile to withstand a 400-lb. per sq. ft. load

CONDENSED SPECIFICATION FOR "CASTONE" CHANNEL TILE

All channel roof tile to be precast light weight (concrete) aggregate. The leg of each tile to be not less than 3⅝ ins. in depth and reinforced with one deformed bar, the web with a sheet of galvanized wire welded mesh accurately placed. Tile to be cast and vibrated in steel moulds to a dense and smooth surface and as nearly perfect as good workmanship will permit. Closed end tile to be furnished in rooms where ceilings are to be exposed. All tile to carry a uniform load of 60 lbs. per sq. ft., with a safety factor of 4 without failing. All joints to be cemented on the upper side with asphaltic cement and left in a smooth, clean condition to receive the composition roofing specified elsewhere.



"Castone" Channel Tile Detail

FEDERAL-AMERICAN CEMENT TILE COMPANY

Precast Reinforced Concrete Roof Slabs

EXECUTIVE OFFICES
608 South Dearborn Street, CHICAGO, ILL.

SALES OFFICES

ATLANTA, GA. BIRMINGHAM, ALA. BOSTON, MASS. BUFFALO, N. Y. CHICAGO, ILL. DETROIT, MICH. DULUTH, MINN. MINNEAPOLIS, MINN. NEW YORK, N. Y. PHILADELPHIA, PA. PITTSBURGH, PA. WASHINGTON, D. C.

PLANTS NEAR: CHICAGO, NEW YORK, PITTSBURGH and BIRMINGHAM

Featherweight Concrete Insulating Roof Slabs

These slabs represent the latest development in permanent, fireproof, no-maintenance roof construction. They are precast of Haydite aggregate (trapped air cells) instead of sand, *weigh as low as 10 lb. per sq. ft.,* are strong, and possess new insulating value. Featherweight Slabs go on the same light steel frame that carries other roofs. Used for flat or sloping roofs. Composition covering is required.

Featherweight Nailing Concrete Slabs

Form a fireproof concrete deck to which slate, ornamental tile, copper or other roofing can be directly nailed.

Featherweight Interlocking Slabs for Pitched Roofs

Form a complete waterproof roof, entirely eliminating all composition covering. Their attractive red color enhances the appearance of the building.

Featherweight Glass Insert Slabs

When used in combination with Featherweight Interlocking Slabs for top lighting, these slabs form an ideal "daylight roof." Can be distributed to admit light over entire floor space, or concentrated over any operation. Glass is embedded in the concrete during manufacture.

Federal Cork Insulated Slabs

Afford a splendid superinsulation for use in extreme conditions, as for instance on certain types of paper mill buildings.

The Roof for Permanence

Featherweight Slabs are made of the most indestructible of all commonly used materials—reinforced concrete. They are not affected by heat, cold, ice, snow, fire, water, acid fumes, gases, or any other destructive forces. They actually grow stronger with age.

Laid directly on structural steel, they make a light weight, fireproof construction requiring no painting, repairing or replacement.

The slabs carry a load well above all building code requirements.

Federal is the lowest cost permanent roof obtainable today. Over two hundred million square feet are in use.

Service and Structural Details

All Federal roofs are installed and fully guaranteed by us. Our engineers will gladly suggest the most economical layout of both steel and slabs, without charge or obligation. "Catalog and Roof Standards" on request.

Standard Specifications

Featherweight Concrete Insulating Roof Slabs

The roof decks are to be Precast Featherweight Concrete Insulating Channel Slabs 2¾ in. deep for spans up to 6 ft. 4 in. and 3½ in. deep or more for longer spans. The web thickness is to be a full one inch, composed of an approved brand of portland cement and the highest grade Haydite aggregate in a mixture of one part of cement to four parts of aggregate accurately graded and thoroughly mixed and vibrated so as to obtain the greatest possible density. Each leg is to be reinforced with one deformed bar accurately centered so as to have at least one-half inch of dense, impervious concrete on all sides. The web of the slab is to be reinforced with a sheet of *galvanized welded* wire mesh accurately centered.

All joints of the channel slabs are to be cemented on the upper side with an approved brand of asphaltic cement and the finished deck to present a smooth surface ready for the application of the composition covering.

Standard slabs to carry 250 lb. per sq. ft., ultimate load uniformly distributed when resting on supports spaced the same as the purlins. No warped, cracked or broken slabs are to be placed in the roof. All slabs to be as nearly perfect as good workmanship will permit.

All slabs to be natural water and air cured under cover where a constant temperature is maintained of not less than 65° F.

The contractor shall submit details of precast slabs for approval before proceeding with manufacture.

All slabs are to be erected by or under the supervision of the manufacturer in a thorough, workmanlike manner.

Featherweight Nailing Concrete Roof Slabs

Standard Slabs to carry 250 lb. per sq. ft. ultimate load uniformly distributed when resting on supports spaced the same as the purlins. All slabs to be as nearly perfect as good workmanship will permit and no cracked, broken or warped slabs are to be placed in the roof. This contractor shall submit details of precast slabs for approval before proceeding with manufacture. All slabs are to be erected by or under the supervision of the manufacturer, in a thorough, workmanlike manner.

Where specified, the roof-decks are to be precast Featherweight *Nailing* Concrete flat slabs of Haydite aggregate designed for the spans shown, with a top section of 1¼ in. of Nailing Concrete cast integral with the Featherweight Concrete bottom section.

Featherweight Interlocking and Glass Insert Slabs

All slabs to carry 250 lb. per sq. ft. ultimate load uniformly distributed when resting on supports spaced the same as the purlins. All slabs to be as nearly perfect as good workmanship will permit and no cracked, broken or warped slabs to be placed in the roof. This contractor shall submit details of precast slabs for approval before proceeding with manufacture. All slabs are to be erected by or under the supervision of the manufacturer in a thorough, workmanlike manner.

Where specified, sloping roofs are to be Featherweight Reinforced Concrete Interlocking Slabs, the exposed surface of which is to present a smooth, permanent, red finish, and this color to penetrate the top one-half of the slab.

Each slab is to be reinforced with a sheet of galvanized cold drawn wire mesh accurately centered in the slab. The longitudinal wires to be spaced not more than 2 in. apart and cross wires woven around the longitudinal wires.

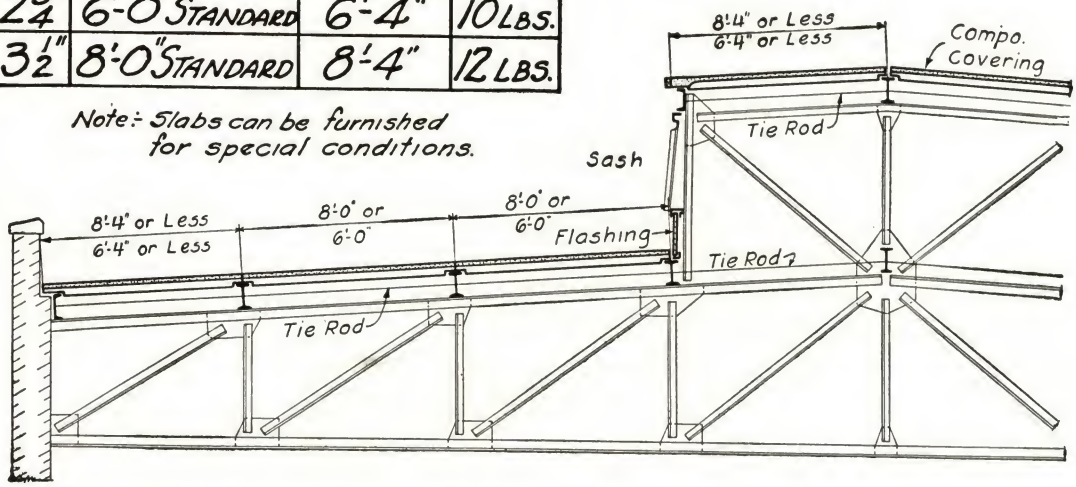
The longitudinal joints to be cemented with a high grade oil cement and a weather cap coat of highest grade elastic compound. The lap or cross joint to be a squeeze joint of high grade oil cement.

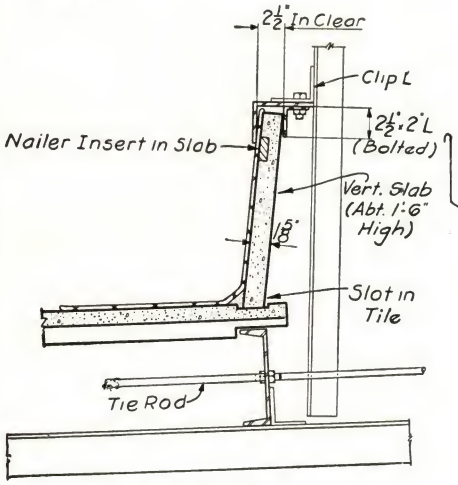
All trimmings, such as ridge roll, flashing slabs, finishing slabs, sawtooth ridges and ventilator collar slabs of the same specification as above, to be furnished as shown on the drawings.

Where shown on the drawings, Glass Insert Slabs are to be furnished. Each slab is to have a sheet of ¼-in. wire glass 21x35 in. embedded in the concrete with an expansion cushion, during the process of manufacture of the glass insert slab, thus becoming an integral part thereof.

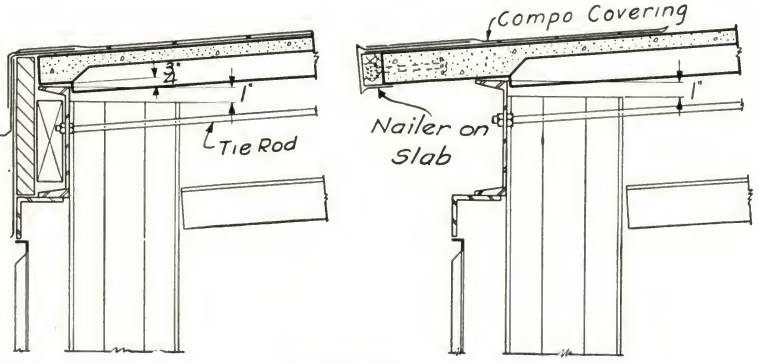
Depth	Length	Maximum Length	Weight Per Sq. Ft.
2¾"	6'-0" Standard	6'-4"	10 Lbs.
3½"	8'-0" Standard	8'-4"	12 Lbs.

Note:- Slabs can be furnished for special conditions.

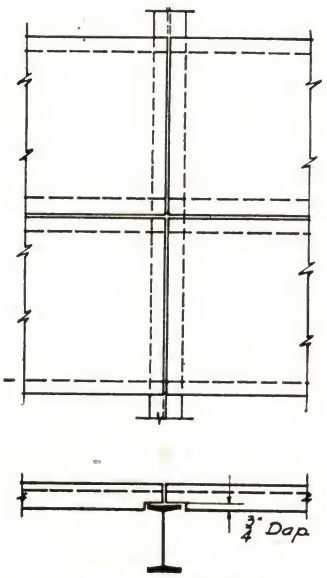




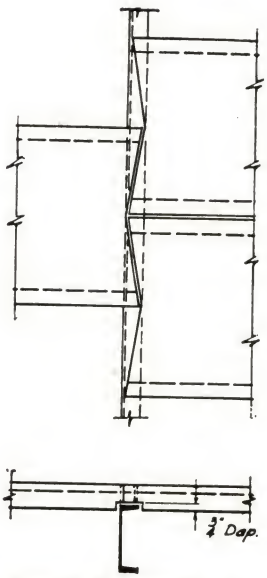
Flashing Detail



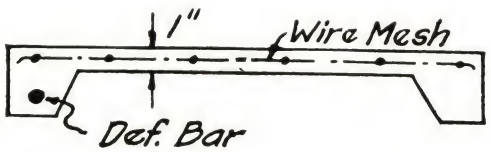
Eave Details



Construction on I-beam Purlins



Dovetail Construction on Channel Purlins



Featherweight Concrete Insulating Roof Slabs

Essential Data

Adapted to all roof decks, flat or sloping. Composition or other covering required.

Space channel or I-beam purlins 6 ft. for standard 2¾ in. channel slabs, maximum 6 ft. 4 in.—weight 10 lbs. per sq. ft. Space 8 ft. for standard 3½-in. slabs, maximum 8 ft. 4 in.—weight 12 lbs. per sq. ft.

Ultimate load 250 lbs. per sq. ft.

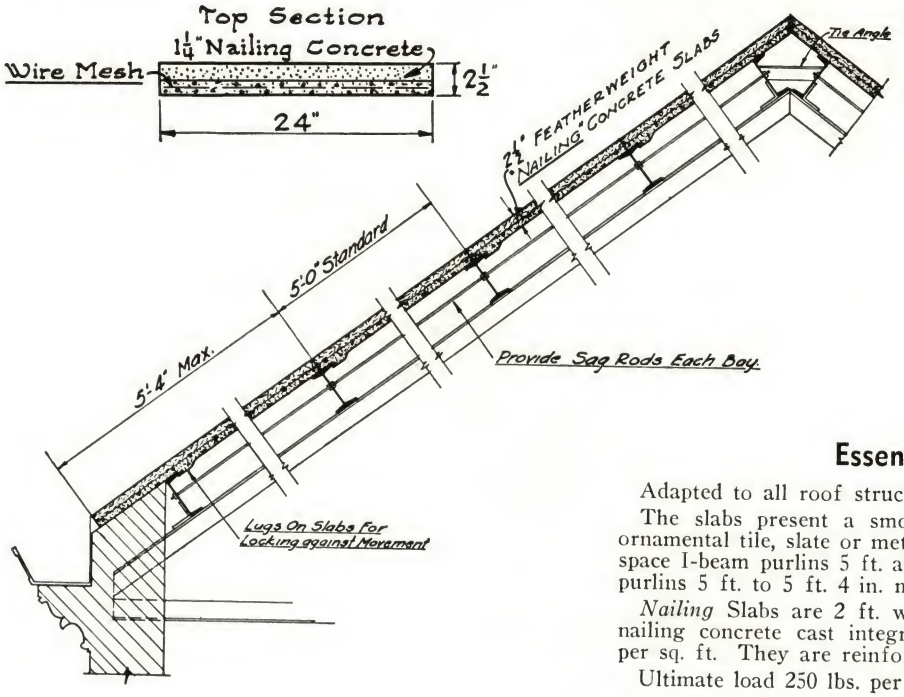
All joints are cemented on upper side with asphaltic cement and the finished deck presents a smooth surface for application of composition covering.

Slabs reinforced with deformed bars in legs and galvanized welded wire mesh in web.

The slabs present a finished ceiling effect on the underside.

See Specifications on preceding page

DETAILS OF FEATHERWEIGHT NAILING CONCRETE SLABS



Ornamental roof nailed directly to this deck.

Essential Data

Adapted to all roof structures of any slope.

The slabs present a smooth surface for application of ornamental tile, slate or metal. For standard *Nailing Slabs,* space I-beam purlins 5 ft. apart. (For longer lengths space purlins 5 ft. to 5 ft. 4 in. maximum.)

Nailing Slabs are 2 ft. wide, with a layer of 1¼ in. of nailing concrete cast integrally on top and weigh 18 lbs. per sq. ft. They are reinforced with galvanized wire mesh.

Ultimate load 250 lbs. per sq. ft.

DETAILS OF FEATHERWEIGHT INTERLOCKING AND GLASS INSERT SLABS

Essential Data

For use on slopes of not less than one-sixth pitch (4-in. rise in 12).

No composition covering required.

Weight 14 lbs. per sq. ft.

Standard dimensions 52 in. long, 24 in. wide, 1⅛ in. thick.

Space channel purlins 3 ft. 9 in. to 4 ft. ½ in. back to back for stock length 52-in. tile. Maximum purlin spacing 5 ft. for special lengths.

Ultimate load 250 lbs. per sq. ft.

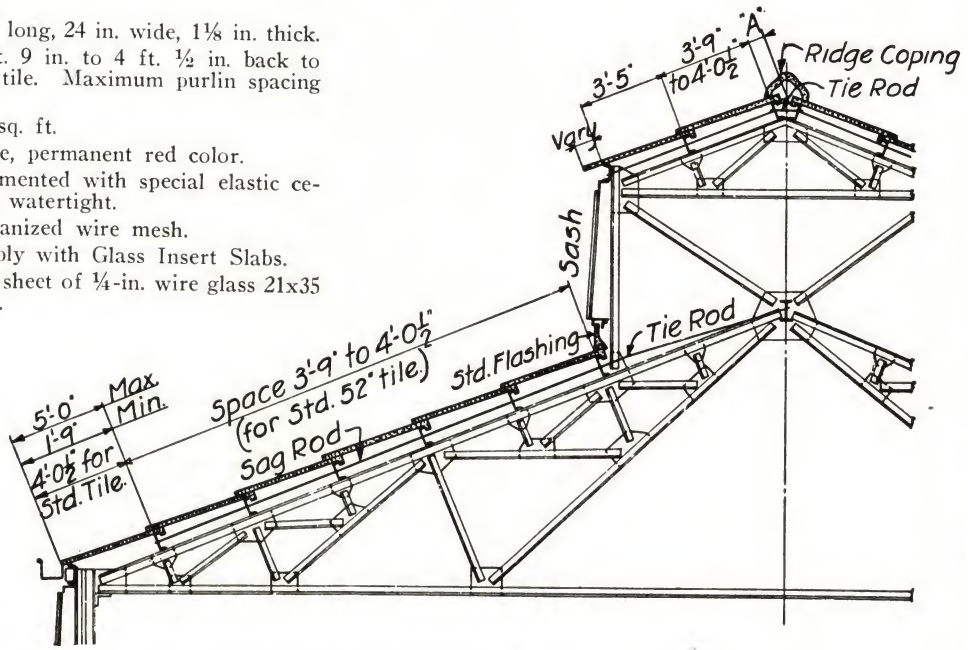
Impervious slabs—attractive, permanent red color.

All joints and overlaps cemented with special elastic cement—guaranteed absolutely watertight.

Slabs reinforced with galvanized wire mesh.

May be used interchangeably with Glass Insert Slabs.

Each Glass Insert Slab has sheet of ¼-in. wire glass 21x35 in. embedded in the concrete.



See Specifications on second preceding page

STRUCTURAL GYPSUM CORPORATION

Manufacturers of Gypsteel Gypsum Pre-cast Floors and Roofs

GENERAL OFFICE
LINDEN, N. J.
(Telephone Linden 2-3700)

FACTORIES: LINDEN, N. J. and AKRON, N. Y.

BRANCH OFFICES

NEW YORK, N. Y. BOSTON, MASS. PHILADELPHIA, PA. BUFFALO, N. Y. SCRANTON, PA. SYRACUSE, N. Y. NEWARK, N. J.

Products

GYPSTEEL GYPSUM PRE-CAST ROOFS and FLOORS.

For Gypsteel Gypsum Partition Tile, Beam and Column Covering and Gypsteel Gypsum Plasters, see Manufacturers' Index.

The many advantages of gypsum for floors, roofs and walls are recognized today more than ever before.

Gypsteel gypsum products enable the designer to achieve maximum efficiency in building design with numerous economies that, we believe, no other type of construction gives.

TRADE-MARK

Services

This Corporation welcomes the privilege of consulting with architects, engineers and builders as to the best methods of utilizing its various types of roofs and floors on any building.

Through affiliated companies it submits proposals for the installation of its products by experienced workmen.

GYPSTEEL PRE-CAST FLOORS AND CEILINGS

PATENTED

What Gypsteel Pre-cast Floor Construction Is and Does

The Gypsteel Pre-cast Floor System combines the calculable strength and safety of steel supporting-members with the unsurpassed fire-resistive properties and lightness of gypsum. It embodies many distinctive advantages unobtainable in other methods of fireproof construction. It has been in constantly growing use for the past eight years.

Gypsteel Pre-cast Floor Construction consists of Standard structural rolled steel sections, or welded, open-web steel joists, on top of which are placed Gypsteel Pre-cast Floor Slabs, and from which are suspended Gypsteel Pre-cast Ceiling Slabs by hangers.

The steel work of the floor is thereby completely fireproofed by a blanket of gypsum 2½ in. above and 2 in. below. The steel rods in the floor slabs are tied together to form continuous reinforcement throughout, imparting the strength and safety of a continuous beam, and holding each slab firmly in place. All slabs being grouted in, the floors and ceilings become practically monolithic.

The completed structural floor is then ready to receive the finished flooring. The ceiling is ready for plaster.

Photographs and details showing exact method of installation of Gypsteel Pre-cast Floor Construction will be found on following pages. Complete bulletin will be mailed on request to our nearest office.

Gypsteel Floor and Ceiling Slabs are made of a particularly high grade calcined gypsum, mixed with a small percentage of fiber and the proper proportion of water. The fiber acts as a binder, and imparts to the slabs their peculiar toughness.

Where They Are Used

Gypsteel Pre-cast Floors are approved for live loads up to 150 lbs. per sq. ft. They are used in schools, hospitals, apartment and hotel buildings, office buildings, public buildings, homes and wherever flat ceilings are desired.

As a result of the standard fire, water and load tests, Gypsteel Pre-cast Floor Construction is approved by the building departments of the principal cities as standard fireproof construction for floors, in buildings of the first class.

Gypsteel Pre-cast Floors Meet All Requirements of a Fireproof Floor Construction

Mere incombustibility is but one of several essential qualifications for a satisfactory fireproofing material.

To perform its proper function in a modern building, a fireproofing material must be more than incombustible.

It must be *fire-resistive,* possessing a degree of non-conductivity of heat that will effectively protect the supporting structural steel work from injury under the most severe conditions of fire.

It should also possess a sufficiently low coefficient of expansion to insure against serious injury, throughout the unchecked duration of a severe fire, and also during the subsequent application of a stream of water at high pressure.

Gypsteel Pre-cast Floor Construction meets all of the very exacting requirements of modern fireproofing. In addition, it embodies many distinctive advantages and economies that cannot be obtained by other methods, as explained on the next page.

GYPSTEEL PRE-CAST FLOORS AND CEILINGS HAVE 12 MAJOR ADVANTAGES

(1) Economy and Uniformity

Standard sizes and quantity production mean moderate cost. Rigid chemical and mechanical control and inspection assure uniform quality.

(2) Strength and Safety

The definite, calculable strength of steel members, combined with conservatively designed slab-span, provide a wide margin of safety. In official load tests failure of the floor slab did not occur until the load had reached almost *ten times* the designed live load of 150 lbs. per sq. ft.

(3) Speed and Ease of Installation

Pre-cast slabs are shipped to the job dry, ready for erection. Simple operations, requiring a minimum of labor, no form work.

(4) Winter Work

Winter has no effect upon the progress of a building when Gypsteel Pre-cast Floors are used. The floors and ceilings can be installed in any weather when men can work. The absence of water enables work on Gypsteel Pre-cast Floors to be conducted on the coldest days.

(5) Fire Protection

The superiority of Gypsteel lies not merely in its incombustibility but, more particularly, in its insulating efficiency, which protects the structural steel against injurious temperatures during a fire; and its freedom, under high temperatures, from the expansion, cracking, spalling, or fusing frequently experienced with other materials. It is approved as fireproof for buildings of the first class, for live loads up to 150 lbs. per sq. ft., by the building departments of the principal cities.

(6) Lightness

The extremely light weight of Gypsteel (21 lbs. per sq. ft. total for floor and ceiling slabs), compared with any other flat-ceiling fireproof construction, permits a substantial saving in the tonnage of columns, girders and footings. In a ten-story building with columns spaced 20 ft. on centers, the saving in dead load effected by Gypsteel Pre-cast floors, as compared with other typical long-span floors, is from *fifty* to *sixty tons* at each column footing.

(7) Sound Insulation

With Gypsteel Pre-cast Floor Construction, the total of 4½ in. of solid gypsum slabs, together with the dead air space between the floor and ceiling slabs, affords a *high degree of insulation against the transmission of sound from floor to floor.*

(8) Heat Insulation

The superior insulating efficiency of Gypsteel Floors means added comfort for the occupants, and less expense to the owners for heating.

(9) Savings in Plaster

Gypsteel ceilings require no bond coat. Gypsum plaster forms a natural chemical bond with a Gypsteel Ceiling.

(10) Alterations and Additions

The light weight of Gypsteel Floors frequently permits adding additional stories to old buildings without strengthening the existing columns or foundations.

For alterations during occupancy, the elimination of form work, drip, etc., when Gypsteel is used, is important.

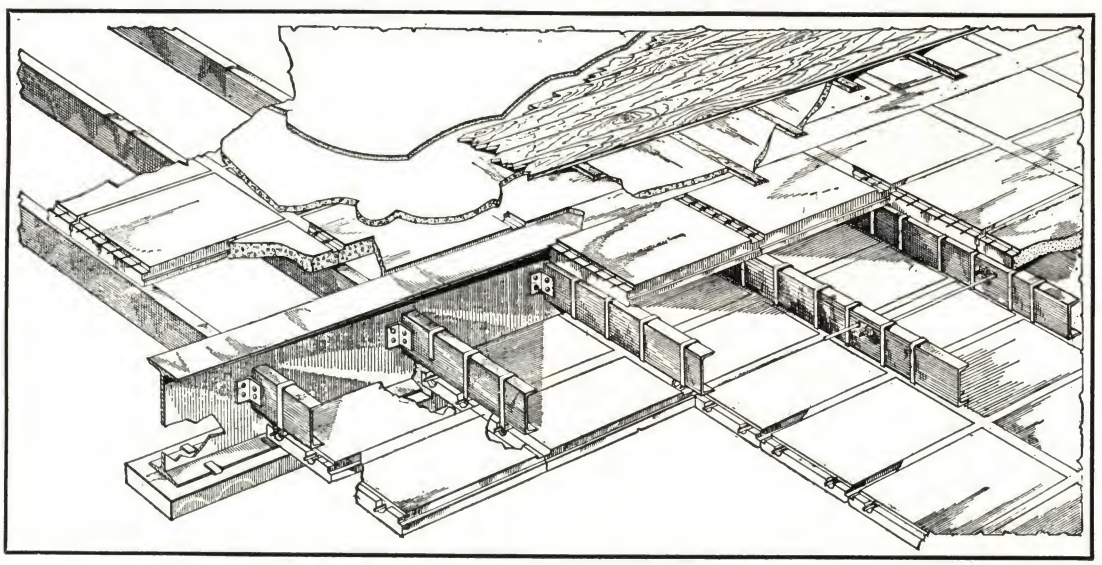
Gypsteel Pre-cast Floors are particularly well adapted for use in installing mezzanines, balconies, loggias, etc., in existing buildings, or for additional floors above the existing structure.

(11) Facilitates Work of Other Trades

The use of Gypsteel Pre-cast Floors facilitates the work of other trades in the usual course of building construction. The cinder fill or finish on top of the floor may be laid at once, and ceilings may be plastered immediately. The ease with which Gypsteel Slabs can be cut, sawed or bored greatly simplifies and speeds up the installation of plumbing, heating and electrical work.

(12) Makes Joist Construction Fireproof

Gypsteel Pre-cast Ceilings are accepted as full-protection fireproofing in the larger cities, and therefore enable the use of steel joists in buildings beyond the height limitation for these members where metal lath ceilings are used.

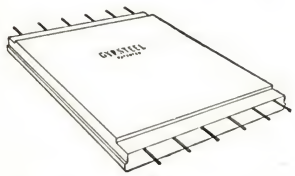


Cutaway View of Gypsteel Pre-cast Floor Construction

COMPONENT PARTS OF GYPSTEEL PRE-CAST FLOOR AND CEILING CONSTRUCTION

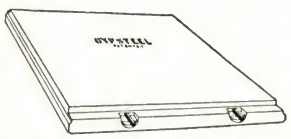
Floor Slabs

The floor slabs used in Gypsteel Pre-cast Floor Construction are 30 in. long, 24 in. wide and 2½ in. thick, reinforced with 6 cold drawn steel wire rods, $\frac{3}{16}$ in. in diameter, spaced 4 in. on centers, each rod emerging from both ends of slabs within ¾ in. of top surface, and projecting about 2½ in. The rods are rigidly restrained in the mould while slab is cast, assuring uniformly correct position.



Ceiling Slabs

Gypsteel ceiling slabs (standard size) are 30 in. long, 24 in. wide and 2 in. thick, reinforced with two steel bars, ⅜x¼ in., projecting beyond each end of the slab. These bars are rigidly held in the proper position in the mould while being cast, assuring accurate alignments. Slabs are also made 24 and 36 in. long.



Soffit Slabs

Gypsteel soffit slabs, 2 or 3 in. thickness, and in varying widths to fit girder flanges, have two pairs of projecting steel straps, ½x⅛ in., embedded in the slab and projecting from the top surface. These projections are securely clamped around girder flanges. Soffit slabs extend not less than 1½ in. beyond the edges of the girder flanges.

Haunch Slabs

Gypsteel haunch slabs are solid, 2 in. thick by 12x30 in.

Hangers

Steel hangers, made in various types to suit the standard rolled and open-web welded sections commonly used as floor members, support the ceiling slabs. They are bent to automatically give the correct alignment of ceiling slabs as they are hung on the job.

Bearing Plates

Bearing plates, so designed as to hold themselves in position, can be supplied for use where flange widths of structural members provide insufficient bearing.

Grout

Gypsteel gypsum grout is used for grouting the floor and ceiling joints. Haunch blocks are set in Gypsteel gypsum mortar.

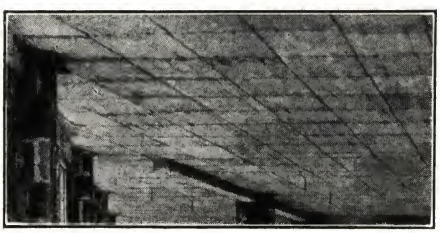
INSTALLATION OF GYPSTEEL PRE-CAST FLOORS AND CEILINGS

Ceiling Slabs Are Hung and Fastened

Projecting rods of each ceiling slab are inserted in slots of hangers, which are then clamped to the steel member. Rods of opposite slabs are fitted into same slots, each slot holding two rods projecting in opposite directions. The portion of the hanger projecting beyond the member is hammered around and under its top flange, forming a secure anchorage. Soffit Slabs are fastened against lower flanges of girders in a similar way, and securely clamped. All joints in ceiling are grouted from above.

Ceiling Is Completed

A flat, regular ceiling is the result, ready for the brown and finish coats of plaster. Grouting seals all joints against passage of heat or flames from below. The bottom of hangers slip into pockets in the slabs, keeping them *out* of the joint, and protecting them by the slab from fire below.



Floor Slabs Are Placed and Tied

Floor slabs are placed from the center of one floor member (these may be standard rolled sections or welded, open-web steel joists) to center of next member with projecting steel rods turned up. These rods are then securely tied together with a mechanical device and hammered down into recesses.

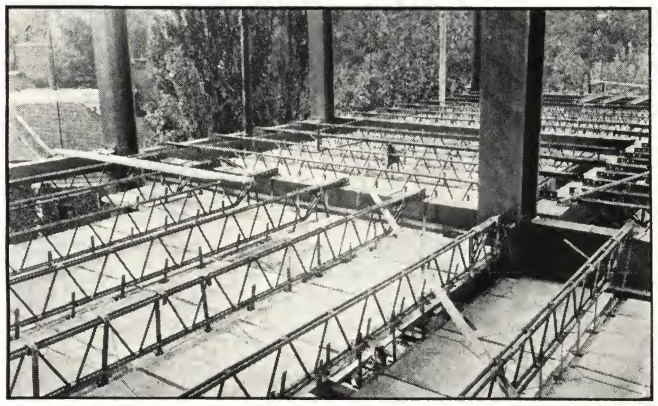
Floor Is Completed

The recesses are grouted, as with the ceiling slabs, and the result is an unbroken flat floor surface ready for the cinder fill or finish floor. The natural bond between the slabs and the gypsum grout, together with the continuity of the steel rods which are tied between slabs, give, in effect, a monolithic construction.

Gypsteel Pre-cast Ceilings Remove Several Limitations on Steel Joist Construction

The problem of using steel joist floor construction, and making it completely fireproof at a practical cost, is solved. Where building codes do not accept metal lath and plaster ceilings, but call for fireproofing the structural steel, a *practical* and *economical* method is to completely fireproof the joists from below with 2-in. Gypsteel Pre-cast Ceiling Slabs. The joists may be fireproofed from above by a concrete or gypsum floor. The Gypsteel Pre-cast Ceiling thus provides an unbroken fireproof protection of 2 in. of solid gypsum, complying with the strictest building code.

The architect or engineer who desires to use steel floor joists for their lightness, convenience and economy, but have his building of the fireproof type, uses Gyp-



Open-web Joists Fireproofed from Below with Gypsteel Pre-cast Ceiling Slabs

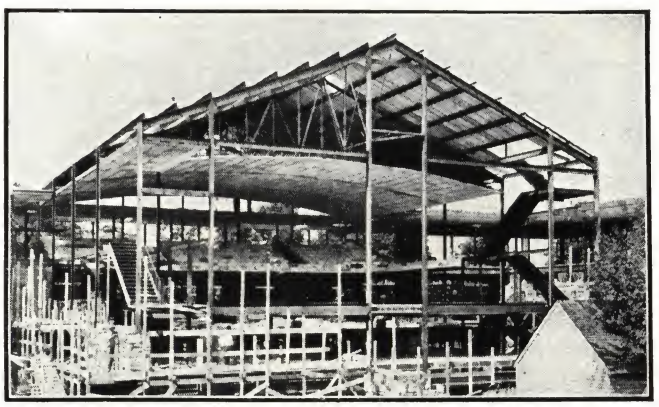
steel Pre-cast Ceilings. Their installation is easy and rapid, and the system is moderate in cost.

Fireproofing Roof Girders and Trusses with Gypsteel Pre-cast Ceiling Slabs

A thoroughly practical and economical method for fireproofing girders and trusses supporting roof construction is shown here. The use of Gypsteel Pre-cast Ceiling Slabs hung directly from a series of light steel angles or channels supported on the bottom chords of the trusses eliminates much of the dead load and expense of encasing the individual members.

The result is a ceiling ready for brown coat of plaster, with all steel work above completely protected from fire from below by the Gypsteel Ceiling. Metal lath and furring is eliminated. A Gypsteel Roof will likewise protect the steel from above.

This type of construction is approved by the build-



Illustrating Use of Gypsteel Pre-cast Ceiling Slabs for Fireproofing Roof Trusses from Below

ing departments of the principal cities, and provides an attractive flat ceiling with all truss work concealed.

Literature—Complete catalogue on Gypsteel Pre-Cast Floors, and Architects' Service Sheets are available on request.

Specifications for Gypsteel Pre-cast Floors and Ceilings

Floors and ceilings shall consist of Gypsteel Pre-cast Floor Construction, manufactured by STRUCTURAL GYPSUM CORPORATION.

Ceiling Slabs—Gypsteel Pre-cast Ceiling Slabs (factory moulded), 2 in. thick, shall be suspended underneath the steel floor members to form a flat ceiling and to fireproof the supporting steel. The ceiling slabs shall be reinforced with ¼x⅜-in. flats running lengthwise and projecting from the ends of the slabs about 1 in. When erected, the slabs shall be hung from their reinforcing by heavy slotted hangers formed from ⅛x1-in. flat steel, securely attached to supporting steel members.

Beveled ribs shall be moulded along the sides of the slabs at the bottom edges. The ribs on adjacent slabs, abutting each other, shall form an open joint ½ in. in width extending downward from the top surface. The ends shall be rabbetted to form slots about 2 in. wide by ½ in. deep extending across the full width of slab. All joints shall be filled solidly with gypsum grout, thus completely sealing them.

Floor Slabs—Shall be 2½-in. thick Gypsteel Pre-cast Floor Slabs moulded at the factory. These slabs shall be reinforced with $\frac{3}{16}$-in. cold drawn wire rods, spaced 4 in. on centers, each reinforcing rod emerging from the ends of the slab within ¾ in. of the top surface, and projecting about 2½ in.

The slabs shall be set in place upon the steel members, each slab spanning one of the 2 ft. 6-in. spaces. The projecting ends of opposite rods in abutting slabs shall be tied together with a mechanical device, furnished by the STRUCTURAL GYPSUM CORPORATION, by means of which these rods shall be drawn up taut at their connections. When tied, the ends of the rods shall lie in depressions formed by the rabbetted ends of the slabs. Ribs similar to those on the ceiling slabs shall form open joints at the sides. All joints shall be filled solidly with gypsum grout, and so leveled off as to form an unbroken surface with the tops of the slabs.

Girder Fireproofing—The projecting webs and flanges of the girders shall be fireproofed by applying, to their soffits, Gypsteel Pre-cast Soffit Slabs, 2 in. in thickness; these slabs shall contain ½x⅛-in. flats, passing transversely through the slabs not less than ½ in. above the lower surface, and the ends of which shall project through the upper surfaces of the soffit slabs and shall be clamped over the girder flanges. Plastic gypsum shall then be deposited in the spaces between the top surfaces of the soffit slabs and the adjacent ceiling slabs, and shall be left square and flush with the outside edges of the soffit slabs. This construction shall give a minimum protection of 1½ in. beyond the outside edges of the steel.

On deep girders and trusses, there may be substituted, for the plastic grout, built-up walls of Gypsteel blocks, not less than 2 in. in thickness, supported by the bottom flanges of girders or trusses and soffit slabs, and laid in gypsum cement mortar.

Insert in Steel Specifications—

Complete steel erection diagrams and shop details prepared by the steel contractor shall be submitted to and approved by the STRUCTURAL GYPSUM CORPORATION for details affecting the Gypsteel Floor and Ceiling Construction (but not for design), before proceeding with fabrication.

Insert in Plastering Specifications—

All ceilings shall be formed of Gypsteel Pre-cast Ceiling Slabs.

Plaster shall consist of gypsum cement mortar mixed in the proportions of 1 part of neat gypsum plaster to not more than 2½ parts clean, sharp sand, by weight. Where necessary, Gypsteel slabs shall be sprinkled slightly with water to reduce suction.

A bond coat is unnecessary on Gypsteel ceiling slabs. The brown coat may be applied directly to the slabs, of sufficient thickness to take up any slight irregularities, but not less than ½-in. thickness at any point. Brown coat shall be laid on with sufficient pressure to force well into all joints and fill same solidly.

Bring brown coat to a straight and even surface to receive finishing coat. Darby lightly and use water sparingly.

***Note:** No lime shall be used in first coat.*

After brown coat has set, any type of finishing coat may be applied, including gypsum finish, lime putty finish gauged with gypsum gauging plaster, sand float finish, Keene's cement finish, etc.

GYPSTEEL PRE-CAST GYPSUM ROOFS

General—Three Types

Gypsteel Pre-cast Roofs are constructed with Long Span Slabs and Short Span Slabs. These roofs have 13 major advantages of construction, economy and upkeep, but their methods of installation are different. Each has certain characteristics making it most adaptable to particular kinds of construction.

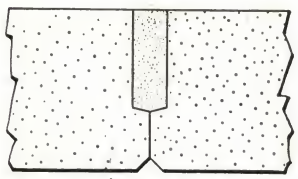
Gypsteel Long Span Suspension Type Pre-cast Roof consists of slabs up to 7 ft. long, spanning the distance between and resting on the top flanges of the main roof purlins. No secondary steel framing is required. The purlins may be spaced to suit the convenience of design up to 7 ft.

Gypsteel Short Span Pre-cast Roof consists of slabs 30 in. in length, resting upon and supported by the bottom flanges of subpurlins, usually tees, angles, light rails, or the Gypsteel subpurlin of exclusive design.

Gypsteel Assembled Pre-cast Roof is a combination of Long Span and Short Span roofs. Standard 30-in hollow short span slabs are assembled in the factory between special rolled steel subpurlins, properly designed to carry the total roof load, thus combining the economies of quantity manufacture of a standard-size product, with the simplicity of long span slab erection.

The composition of which all Gypsteel slabs are made is purest calcined gypsum, with which is mixed a small percentage of fiber that acts as a binder and imparts to the slabs their peculiar toughness and elasticity.

A highly important and patented detail of all Gypsteel Pre-cast Slabs is the narrow beveled rib moulded along the sides at the bottom edges. These ribs on adjacent slabs abut each other, forming an open joint ½ in. wide extending downward from the top surface more than two-thirds of the slab depth. This slot, when solidly filled with Gypsteel gypsum grout, makes a tight, sealed joint that prevents the asphalt or pitch of the waterproofing from seeping through the side joints when it is softened by the sun in warm weather.



Section Through Abutting Gypsteel Pre-cast Slabs
Showing patented side joint sealed with grout

Where Each Type Is Used

For maximum economy and simplicity of construction the Gypsteel Assembled Roof is recommended for all general roof construction.

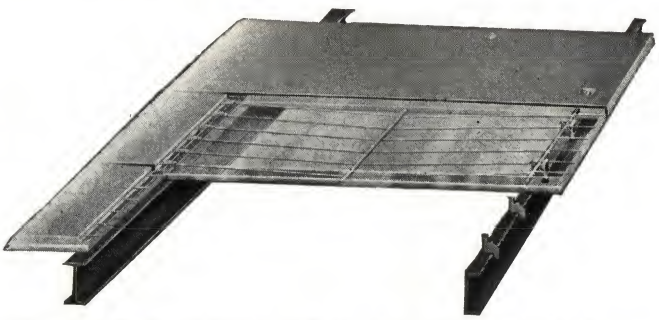
Where the paneled effect in the ceiling made by the exposed bottom flanges of the Gypsteel subpurlins may not be acceptable, or where manufacturing processes producing high temperatures and humidities may cause excessive condensation to form on the subpurlins, the Gypsteel Suspension Type Long Span Roof is offered. This system, with its smooth ceiling formed by slabs passing entirely over the supporting steel, gives an unusually pleasing appearance and the highest possible insulation.

For curved surfaces, very irregular roofs, or those with numerous hips, valleys or dormers, the Gypsteel Short Span Roof is most adaptable.

Gypsteel Pre-cast Roofs are used for all types of industrial buildings, apartment houses, churches, clubs, garages, hospitals, hotels, office buildings, public buildings, schools, theatres and similar buildings.

What Gypsteel Suspension Type Pre-cast Long Span Roofs Are and How Installed

Gypsteel Suspension Type Pre-cast Roof Construction consists of closely spaced steel cables in deflection and tension, embedded in and entirely supporting pre-cast slabs of Gypsteel gypsum composition, as illustrated in the phantom drawing.

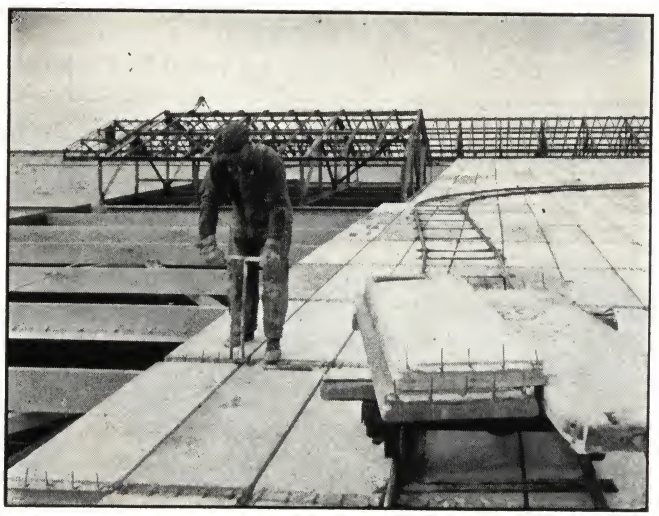


Phantom View of Gypsteel Suspension Type Pre-cast Long Span Roof Construction
Showing cable ties, anchorage and grouted ends, side joints, anchor slots, cables in deflection and tension running through slabs, ends of cables tied together and hammered down in depression between slabs

The Gypsteel slabs are moulded at the factory in steel forms, in which the steel cables are placed and held in uniform deflection and tension. Each cable in the finished slab emerges within ¾ in. of the top of the slab surface, and projects not less than 2½ in. beyond the ends of the slab.

The slabs are laid from center to center of the main roof purlins, abutting cables are twisted together and hammered down into the recesses, while at the sides of the building they are securely anchored to the steel frame. All joints are then grouted to form, in effect, a monolithic roof. As soon as grout has set, waterproofing may be applied. There is no waiting for the roof to dry out, or for forms to be stripped.

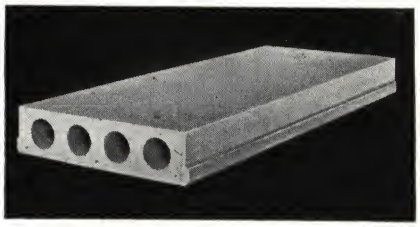
Gypsteel Suspension Type Pre-cast Roofs are suitable for all classes of roofs not excessively steep in pitch, and having rectangular areas.



Installation of Suspension Type Roof
Projecting cables are tied together, hammered down, and joints grouted

What Gypsteel Pre-cast Short Span Roofs Are and How Installed

Gypsteel Pre-cast Short Span Roofs consist of reinforced rectangular solid or hollow slabs of Gypsteel composition manufactured in standard length of 30 in. only. The solid slabs are 24 in. wide and come in 2½, 3 or 3½-in. thickness. The hollow slabs are 12 in. wide and 3-in. thick. These slabs are set on subpurlins which span the distances between and rest upon the main purlins or trusses, to the top flanges of which the subpurlins are either bolted, clipped or spot welded. The simplicity of its design and installation permits speedy erection with inexperienced labor.



3-in. Hollow Short Span Slab

Short Span roofs are particularly adaptable to buildings where the pitch is unusually steep or cut up by hips and valleys, or where there are dormers or many other irregular openings. Supported by Gypsteel subpurlins where the main purlins are not over 7 ft. 9 in. on centers, or by 16-lb. light rails if the spans are greater, they are very economical on the usual factory or flat pitched type of roof.

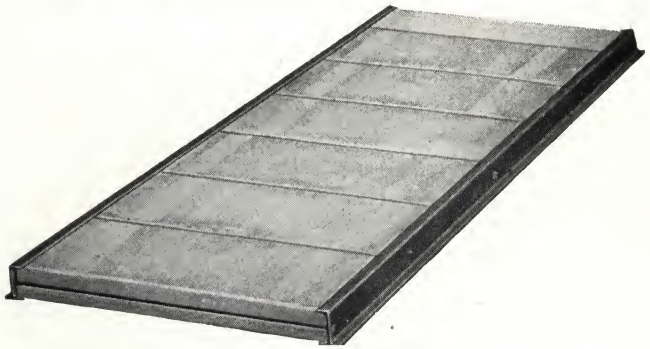
Installation of Gypsteel Pre-cast Short Span Roof

The slabs are set on the flanges or horizontal legs of light rail, tee, angle or Gypsteel subpurlins, spaced about 30½ to 31½ in. on centers—each slab spanning one of the subpurlin spacings. The spaces between the ends of the slabs, and over the intervening railheads, stems of tees, or vertical legs of angles, are solidly filled with gypsum grout, which is leveled flush with the top surface of the slabs.

What Gypsteel Pre-cast Assembled Slab Roofs Are and How Installed

Gypsteel Pre-cast Assembled Roofs give maximum economy and simplicity, combining the advantages of Long Span and Short Span roofs, as already described.

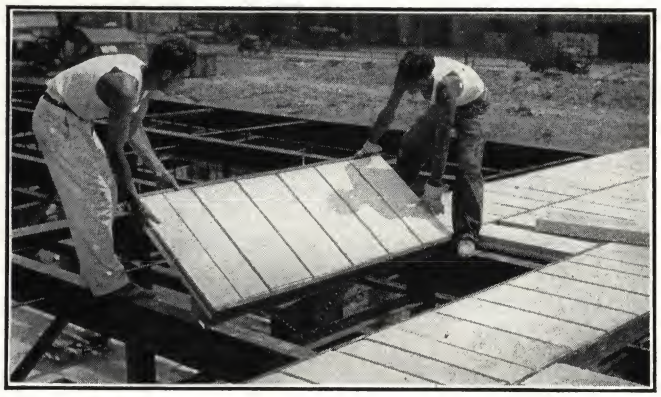
Gypsteel Pre-cast Assembled Roofs are recommended for all types of rectangular shaped roofs, pitched or flat, where conditions of high humidity are not normal in the building. As the slabs are hollow, they are not recommended where copper, slate, or tile roofing is to be nailed direct to the slabs.



Assembled Slab

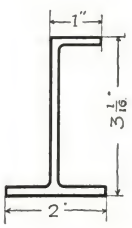
Showing hollow short span slabs between patented Gypsteel subpurlins

Standard Gypsteel Pre-cast 30-in. hollow roof slabs are assembled *at the factory,* between Gypsteel subpurlins of exclusive design, to form units 30 in. wide that span the distance between and rest upon the top flanges of the main roof purlins. Of rolled steel, the strength of these subpurlins is readily calculable, and is more than twice as great as any section of equal weight that can be used for similar purpose. Based upon accepted engineering design, this construction will safely carry a live load of 30 lbs. per sq. ft. on purlin spacings up to 7 ft. 9 in.



Installing a Gypsteel Pre-cast Assembled Slab Roof

The complete units are erected in continuous lines approximately 30½ in. apart. The space between is then filled with Gypsteel Pre-cast Short Span hollow slabs, which rest upon the outstanding lower flanges of the factory assembled units. All joints between the sides and ends of the slabs are then flushed full with gypsum grout, which is brought level with the top surfaces of the slabs.



ELEMENTS OF GYPSTEEL SUBPURLINS

Weight per linear foot	2.64 lbs.
Area	.775 sq. in.
Moment of inertia	1.079 in. 4
Section modulus	.603 in. 3

TOTAL LOAD CARRYING CAPACITY IN POUNDS PER SQUARE FOOT

Based on 30-in. spacing

M = WL/8 S = 18,000 Maximum deflection .268 in.

Span	5′–0″	5′–6″	6′–0″	6′–6″	7′–0″	7′–6″
Load, lbs. sq. ft.	115	95	80	68	59	51

GYPSTEEL PRE-CAST ROOFS HAVE 13 MAJOR ADVANTAGES

(1) Fire Resistance

The gypsum composition used in Gypsteel Pre-cast Roofs is universally accepted as the highest class fireproofing material. Gypsteel Pre-cast Roof Construction provides such high resistance to fire that insurance underwriters offer rates on buildings with Gypsteel Roofs, unsprinklered, that are as low as the rates quoted for wooden roofs with automatic sprinklers.

(2) Savings in Fuel and Heating Plant

Because gypsum is an unusually effective heat insulator, Gypsteel Pre-cast Roofs bring a substantial saving in fuel consumption and original investment for heating equipment.

We have available upon request, copies of a report of Prof. Chas. L. Norton on the relative effectiveness of various roofs in preventing condensation and heat loss, containing formulae and tables from which may be readily determined the saving in fuel and heating equipment by using Gypsteel Pre-cast Roofs.

(3) Preventing Damage from Condensation and Drip

Condensation occurs when the temperature of the underside of a roof falls but a few degrees below the room temperature. This fall in temperature is the result of heat-loss *through* the roof deck, or the flow of the indoor heat to the colder outdoor air.

By reason of its high insulating value, a Gypsteel Pre-cast Roof prevents condensation from forming under conditions of humidity and differences in indoor and outdoor temperatures that would cause drip from other types of roofs. The condensation points under wide ranges of humidity and temperature are charted for Gypsteel and other types of roofs in the report of Prof. Chas. L. Norton, a copy of which will be sent upon request.

Condensation and drip must be prevented if damage to machinery and goods, as well as roof repairs and replacements, are to be avoided. Where the humidity within a building might cause condensation to form upon the bottom flanges or subpurlins supporting the roof, this condition may be avoided by using the Gypsteel Suspension Type Roof which spans the distance between and passes over the top flanges of the main roof purlins.

(4) Strength and Safety

Each type of Gypsteel Pre-cast Roof is based upon the most conservative design. The load carrying members supporting the Assembled Construction are rolled steel sections, the capacity of which is calculated in accordance with the standard practice of the A. I. S. C. The pre-cast slabs used in both this and the Short Span Construction *span only 30 in.* and by actual tests of recognized laboratories will *safely sustain many times the normal roof loads.*

The Long Span Suspension Type Construction is based upon the principle of the suspension bridge; continuous cold drawn steel cables, anchored at the eaves to the steel frame, carry the entire load. The compressive value of the Gypsteel Composition is not considered as in reinforced concrete design.

(5) Economy—Lightness

The extremely light weight of Gypsteel Pre-cast Roofs permits of a substantial reduction in the weight of supporting steel, and in the foundation, as compared to many other types of fireproof roof construction.

This saving in structural steel, combined with the moderate cost of Gypsteel slabs resulting from quantity production by modern machinery, makes them one of the most economical of fireproof, insulating roofs.

(6) Attractive Appearance

The smooth undersurface of Gypsteel Pre-cast Roof Slabs gives an attractive appearance, reflects a maximum amount of light, and does not collect dirt or dust.

(7) Speed and Ease of Installation

Absence of form work and drip during installation makes Gypsteel Pre-cast Roofs easy and rapid to install. The almost incredible speed with which Gypsteel Pre-cast Roofs can be installed represents a real, calculable saving to both owner and contractor. There are no forms to erect or strip, no concrete to set. Since no water is employed in the installation of Gypsteel Roofs (except the negligible quantity used to mix the grout for the joints) no time is wasted in waiting for slabs to dry. Roof decks can be laid and the work carried ahead as rapidly as the steel work permits. Waterproofing can follow the erection of the roof slabs at once.

(8) Winter Work

Gypsteel Pre-cast Roofs can be installed in any weather in which men can work, so long as supporting steel is not encased in ice. Absence of water from the operation makes winter work practical and results certain.

(9) Non-corrosiveness

The gypsum composition used in Gypsteel Roof Construction is an effective preservative against corrosion of the encased steel. Gypsum slabs removed from buildings during alterations, after having been in place for more than 20 years, have in all cases shown the encased cables to be entirely free from corrosion.

(10) Durability and Longevity

A Gypsteel Pre-cast Roof is *permanent.* It eliminates repairs, maintenance and renewals. It offers an ideal surface for application of waterproofing.

(11) Cooler in Summer

Comparative tests under identical conditions have shown that the temperature beneath a Gypsteel Pre-cast Roof is substantially lower in summer than that below many other roofs.

(12) Non-expansiveness

Because gypsum has a coefficient of expansion of practically zero, Gypsteel Pre-cast Roofs do not crack or spall due to extreme variations in temperature. This property of Gypsteel Roofs is particularly important in industrial buildings having an unbroken stretch of roof area many hundreds of feet in length.

(13) Resistance to Vibration

Gypsteel Pre-cast Roofs do not crack under the vibration of roof structure frequently encountered in certain industrial processes. They resist vibration because of their toughness and elasticity. Gypsteel composition is sufficiently elastic to absorb or cushion vibrations and pulsations without any tendency to crack or spall.

DETAILS AND SPECIFICATIONS OF LONG SPAN, SHORT SPAN AND ASSEMBLED SLAB ROOFS

Details of Suspension Type Long Span Design

In designing Gypsteel Suspension Type Roof Construction, the cost, both for labor and material, is reduced if the purlins run perpendicular to the longest dimension of the building. Under these conditions the slabs are so placed as to run the long way of the building, thereby requiring less anchorage and consequently necessitating less time in fastening the slabs to the end purlins.

The strength of Gypsteel Suspension Type Roofs is due to the suspension principle of design employed. For this reason, the supporting cables must be securely anchored at their ends. End or anchorage purlins must therefore be provided at the outside walls as well as at inside points, such as at the bases of monitors, ventilator frames, etc.

In all instances the anchorage steel members should be placed with the flanges turned out, so that the anchors can be attached to the top flanges. If, however, other details require that these end purlins be set with the flanges turned in, angles should be riveted to the backs of the channels, with the top surfaces of the angles and of the purlins in the same plane.

If the supporting purlins have flanges less than 2½ in. in width, it is necessary to use bearing plates for the temporary support of the slabs until the supporting suspension cables are tied up and grouted. When these are necessary they are furnished with the Gypsteel Slabs.

Tie-rods should be specified as it is practically impossible for the steel erectors otherwise to set and hold purlins true to line.

Since the supporting steel cables are placed in tension as well as deflection, the resulting pull exerted upon the end purlins or trusses must be allowed for. This is ordinarily done by means of angle and tie-rod bracing.

This bracing should be shown on the steel drawings, and provided by the steel contractor during fabrication, at considerably less cost than if it were cared for under separate contract.

The maximum unsupported overhang is 12 in. beyond the outside edge of the anchorage purlin. Where such an overhang is partially supported by a wall, it may extend not over 18 in. beyond the outside edge of the anchorage purlin, and not over 12 in. beyond the outside face of the wall, providing the over-all length of the slab does not exceed 7 ft. 6 in.

At the sides of the building where slabs are not anchored, the overhang must not extend more than 6 in. beyond the outside face of the wall, end of purlin, or other support.

The maximum span allowable with Gypsteel Suspension Type Pre-cast Roofs is 7 ft.

Specifications for Gypsteel Suspension Type Pre-cast Long Span Roofs

All roof decks shall consist of Gypsteel Suspension Type Pre-cast Roofs manufactured by the STRUCTURAL GYPSUM CORPORATION. The slabs shall be moulded at the factory and be designed to safely carry a live load of .... lbs. per sq. ft., with a factor of safety of 4.

The load shall be supported by cables, consisting of $\frac{3}{16}$-in. cold drawn steel wires, embedded in each slab and spaced at proper distances apart to develop the above live load capacity with a factor of safety of 4. These cables shall have been put into uniform deflection and tension by means of steel deflection-rods, at the center of each slab, rigidly restrained at the sides of the mould. The cables shall project not less than 2½ in. at each end of the slab.

The slabs forming the end—or anchorage panel—shall have embedded at the anchorage end ⅝-in. round steel bars. These bars shall be rigidly restrained at the sides of the mould, so as to permit of the supporting cables being put into uniform deflection and tension after the cables have been securely fastened to said bars and before the Gypsteel Composition is poured into the mould. By means of cores, slots shall be formed in the slab at the anchorage end to receive the anchors, the anchorage bar, embedded in the slab, spanning these slots.

The slabs shall be laid in place on the purlins, with their ends abutting each other. In erecting the anchorage slabs, the Gypsteel Anchors (made from heavy steel plates) shall be set in place on the flanges of the end purlins and the slabs lowered into position, the anchors coming up through the slots with their necks inside of the exposed anchorage bar in the slots. The slab shall then be pulled inward until the bar engages the anchors snugly, and the slots flushed full of gypsum grout, embedding the anchors and the bar, where the latter spans the slots.

The supporting cables, projecting from the ends of the slabs, shall be firmly tied up to each other so as to become continuous from one anchorage point to the other. When tied, the ends of these cables shall lie in the depression formed by the rabbeted ends of the slabs, and this depression shall be filled solidly with a gypsum grout, which shall be leveled off so as to form a smooth surface with the tops of the slabs. A special device designed and manufactured by STRUCTURAL GYPSUM CORPORATION shall be employed for tying of these cables to insure each tie being uniformly tight and without play.

Where overhanging eaves are shown, these shall be formed as part of the end or anchorage slab, by continuing the supporting cables entirely around the embedded anchorage bar, so that the cables project beyond the bar to within ¼ in. of the edge of the overhang. The overhang shall then be poured with and become part of the end slab.

Insert in Mason's Specifications—

In case the eave purlin or any purlin to which it is necessary to anchor the slab is buried in a wall, or the anchor flange comes within less than 1½ in. of a wall, the mason contractor shall not carry the brickwork above the lower flanges of the wall purlins or trusses until the roof slabs have been set in place, in order to permit of the slabs being anchored to the upper flanges; except where parapet walls occur, in which case the mason contractor shall leave recesses or form corbels at the proper level to receive the ends of the slabs.

(Also add General Specifications for all Gypsteel Pre-Cast Roofs, on following page.)

Details of Short Span Design

The subpurlins supporting the Gypsteel Short Span Slabs should be erected in parallel lines, and in the same plane, approximately 30½ to 31½ in. on centers, depending upon the type of section used, thickness of stem, etc. Along hips and valleys provide support for the diagonal sides of the slabs. On pitched roofs, where the subpurlins run up and down the slope, provide, at the foot of all slopes, stop angles or masonry to take the thrust.

Specifications for Gypsteel Pre-cast Short Span Roofs

All roof decks shall consist of Gypsteel 3-in. Hollow Short Span Pre-cast Roof Slabs (or solid—2½, 3 or 3½ in. thick), manufactured by the STRUCTURAL GYPSUM CORPORATION. These slabs shall be supported by subpurlins designed safely to carry a live load of —— lbs. per square foot.

Slabs shall span the distance between, and rest directly upon, the horizontal flanges of the subpurlins. The joints between the sides of the slabs formed by beveled ribs moulded along the bottom side edges, and the spaces between the ends of slabs, are to be flushed solid with gypsum grout, and leveled off flush with the top surface.

(Also add General Specifications for all Gypsteel Pre-Cast Roofs, on following page.)

Details of Assembled Slab Design

No supplementary subpurlins, bracing, etc., beyond that required for ordinary roof construction, are necessary for Gypsteel Assembled Roofs. It is unnecessary to provide supporting steel at the eaves providing the masonry is built to, or a shelf is left at, the proper level to support the slabs.

For maximum economy, purlins should be spaced 7 ft. 9 in. where a 30-lb. live load is acceptable and 7 ft. where 40 lb. is required. Contrary to the Long Span Construction, it is more economical if the purlins run parallel to the length of the building. This applies particularly to sawteeth, where purlins should run across the slope, or to other narrow runs, where they should run the length of the area.

Where necessary, in order to take up any thrust in the roof, steel plates are riveted to the bottom flanges of the Gypsteel Subpurlins at their up-slope ends. These plates pass over and are bent around the top flanges of the main roof members. At the eaves, a small plate is welded across the end of each subpurlin to prevent movement of any of the field slabs due to the roof slope.

Specifications for Gypsteel Pre-cast Assembled Slab Roofs

All roof decks shall be of Gypsteel Pre-cast Assembled Roof Construction, manufactured by the STRUCTURAL GYPSUM CORPORATION. Units of a length to span the distance between purlins, shall be factory assembled from Gypsteel Subpurlins and Gypsteel Hollow Roof Slabs, 3 in. thick, 12 in. wide, 30 in. long. These units shall span the distance between and rest upon the top flanges of the roof purlins, and shall be erected

in parallel lines approximately 30½ in. apart. Between the assembled units shall be placed individual Hollow Roof Slabs, of the same size as used in the composite slab, resting upon the outstanding bottom flanges of the Gypsteel Subpurlins.

The joints between the sides of the slabs formed by beveled ribs moulded along the bottom side edges, and the spaces between the ends of slabs, are to be flushed solid with gypsum grout, and leveled off flush with the top surface.

(Also add General Specifications for all Gypsteel Pre-cast Roofs, immediately following.)

General Specifications for all Gypsteel Pre-cast Roofs, to Be Added to Specifications for Each Type As Given

Curbs under and heads over sash shall be constructed of 3-in. slabs of Gypsteel Composition, properly reinforced when necessary with rods and left ready for waterproofing. These slabs shall be laid in place between angles properly spaced and located to provide supports for same, and shall then be grouted with gypsum cement mortar and left ready for waterproofing.

Gable and Sawtooth Ends—Gable ends and the ends of sawteeth should be built of 3-in. blocks of Gypsteel Composition, laid in gypsum cement mortar, with joints struck neatly. With this form of construction, the outside surface should be protected with built-up or composition waterproofing. On high walls, steel framework must be provided behind the wall so that it may be tied at intervals. The diagonals of trusses are usually sufficient for this purpose. Provision should be made at the base of heavy walls for their support independent of the roof slab.

Insert in Steel Specifications—

Before proceeding with fabrication, the steel contractor shall submit drawings for checking by the STRUCTURAL GYPSUM CORPORATION, in order to insure all details being cared for which may be necessary to insure the proper installation of the Gypsteel Roof Construction—such as framing of all purlins with tops in the same plane, framing out of openings; bracing where necessary; position and spacing of angles supporting curbs, heads, etc.

Literature

Complete catalogue on Gypsteel Pre-Cast Roofs and Architects' Service Sheets are available on request to our Linden, N. J., office.

REPRESENTATIVE LIST OF CORPORATIONS AND OTHERS USING GYPSTEEL PRE-CAST ROOFS

Virginia-Carolina Chemical Co.
Celanese Corp. of America
Union Smelting & Refining Co.
Western Maryland Ry. Co.
National Electric Products Co.
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Otis Steel Company
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R. H. Macy & Co. Inc.
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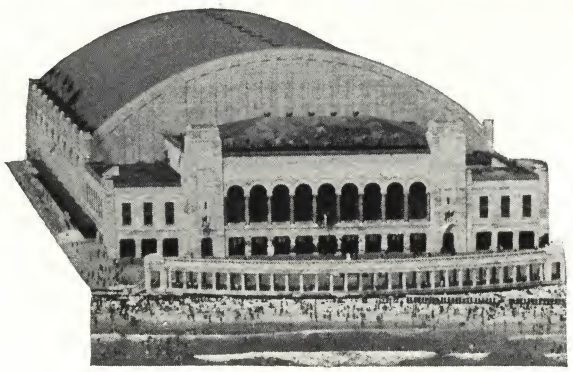

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The world's largest auditorium is roofed with Gypsteel

REPRESENTATIVE INSTALLATIONS OF GYPSTEEL PRE-CAST FLOOR CONSTRUCTION

(Name of Building is followed by name of Architect)

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800 West Ferry Street, Buffalo, N. Y., Bley & Lyman
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Technical High School, Scranton, Pa., A. J. Ward
Delaware Avenue Grade School, Tonawanda, N. Y., Edward B. Green & Sons
Amesbury Hospital, Amesbury, Mass., Kendall, Taylor & Co.
Lawrence Hospital, Nurses Home, Bronxville, N. Y., Bates & Howe
Norwood Hospital, Norwood, Mass., J. Williams Beal & Sons
Museum of Natural Science, Buffalo, N. Y., Esenwein & Johnson
Genesee Valley Trust Co., Rochester, N. Y., Voorhees, Gmelin & Walker
Rhode Island Insurance Co. Office Building, Providence, R. I., Howe & Church
Hotel Hildebrecht, Trenton, N. J., Walter Hankin
Molly Pitcher Hotel, Red Bank, N. J., Nathan Harris
Wychwood Apartment, Great Neck, L. I., N. Y., Schwartz & Gross.
Hotel Suburban, East Orange, N. J., E. V. & C. F. Warren
Frances Willard High School, Scranton, Pa., Frank J. Miller
Junior High School, Upper Darby, Pa., Heacock & Hokanson
Longfellow Junior High School, Yonkers, N. Y., G. Howard Chamberlin
Monroe County Hospital, Rochester, N. Y., Horace T. Hatton
Mercy Hospital, Buffalo, N. Y., H. L. & W. T. Spann
Seneca Theatre, Buffalo, N. Y., Henry L. Spann
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Ross Stores, Inc., Yonkers, N. Y., Hopkins & Dentz.
Sibley, Lindsay & Curr Co. (Addition), Rochester, N. Y., J. Foster Warner
Johnston Building (addition), Charlotte, N. C., W. L. Stoddart
Saks-Herald Square (Addition), New York, N. Y., Starrett & Van Vleck
Newark Evening News (Addition), Newark, N. J., D. H. Scudder
Hotel Pennsylvania (Addition), New York, N. Y., McKim, Mead & White
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Commonwealth Building (Alteration), Philadelphia, Pa., John T. Windrim.

895 Park Avenue, New York, N. Y.

SLOAN & ROBERTSON, Architects — THOMAS O'REILLY & SON, Builders — LANGE & NOSKA, Engineers

An example of the type of buildings which have Gypsteel Pre-cast Floors and Ceilings throughout

The Red Book of Building Material

Contracting Division

Fireproofing Specialities

Roof and Floor Constructions

United States Gypsum Company

300 West Adams Street, Chicago

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CONTRACTING DIVISION

300 West Adams Street, CHICAGO, ILL.

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PRODUCTS DESCRIBED IN OTHER CATALOGUES

See Sweet's Manufacturers' Index for:

(1) Rock-lath Metal Laths and Accessories; Standard X Plastering System; complete line of Red Top Gypsum Plasters; Red Top Finishing Lime; Red Top Exterior Oriental Stucco; Sheetrock (Wall Board).
(2) Econo Expanded Metal.
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(6) Chromite—Sheet Metal Wall Tile.

UNITED STATES GYPSUM COMPANY CONTRACTING DIVISION

Gypsum Roof Tile—Gypsum Roof Systems Gypsum Floor Systems—Steel Roof Deck Gypsum Precast Ceiling and Floor Construction—Gypsum Partition Tile—Gypsum Column, Beam and Girder Fireproofing

Experience and Facilities

The UNITED STATES GYPSUM COMPANY is a pioneer in the development of gypsum tile and poured gypsum constructions for fireproof buildings. More than fifteen years ago the company experimented with reinforced gypsum blocks in roof construction in its own plants in an endeavor to increase the insulation value and stop condensation. So successful were these installations that the company decided to offer the roofs to other manufacturers and builders. At present over 100,000,000 sq. ft. of gypsum roofs are in successful use, and many representative firms have standardized on gypsum roofs. A list of installations will be sent on request.

Standardized methods and rigid inspection result in uniform quality. Complete control of every operation, from the mine to the erection of the material in the building, is made possible by the close co-ordination of engineering, manufacturing and contracting service.

The company's twenty-two sales offices—see foreword—located in the important building centers, assure adequate architectural service. The numerous manufacturing plants, strategically located, assure exceptional national distribution facilities.

Engineering Service

The UNITED STATES GYPSUM COMPANY employs a staff of competent engineers experienced in floor and roof design. To secure the most *practical and economical designs best adapted to the particular type of building,* we strongly recommend consultation with our local sales and service office *at the time the building is designed.* A word to your local U.S.G. representative will place our engineering department promptly at your disposal without obligation.

U S G

TRADE-MARK

Erection Service

The UNITED STATES GYPSUM COMPANY maintains a Contracting Division which contracts for the complete construction of gypsum roofs, floors, partitions, and fireproofing. Our crews of experienced field superintendents and workmen are equipped to erect U.S.G. products on any type of building anywhere, including the furnishing and erection of any necessary T-iron or rail subpurlins on either new or alteration work. We also contract for sound insulation treatment.

The employment of our construction organization assures the architect of rapid, continuous progress with the maximum economy and the highest type of workmanship and careful, intelligent supervision. During the past fifteen years the UNITED STATES GYPSUM COMPANY has installed more than fifty million square feet of gypsum roof construction throughout the country on all types of buildings.

Estimates furnished upon request.

GYPSUM—GENERAL TECHNICAL DATA

Gypsum

Chemically, gypsum is hydrous calcium sulphate $CaSO_4$ $(2H_2O)$. It is a widely distributed mineral found in rock formation. The rock gypsum is crushed, ground and then calcined, which drives off a part of the molecular water, forming the hemihydrate or plaster of paris. This product, when mixed with water, takes up or combines with the same amount as was driven off in the calcination process.

Gypsum is one of the most ancient of building materials. The Greeks used gypsum in Pliny's time (23-79 A.D.). The Temple of Apollo at Bassae (470 B.C.) affords an excellent example of the use and permanent structural qualities of gypsum. The Egyptian pyramids contain plaster works of gypsum, executed at least 4,000 years ago.

Structolite

An exclusive UNITED STATES GYPSUM COMPANY product developed in 1916. It consists of calcined gypsum subjected to certain mechanical and chemical treatments which produce a very dense, high grade product named "Structolite" because of its *great structural strength* and *comparative light weight.*

Hydrocal

A quick setting, structural cement, basically gypsum, of high wet and dry strength and low absorption. Produced by the UNITED STATES GYPSUM COMPANY under a special process (patents applied for).

Fireproof

The superior qualities of gypsum as a fireproof building material have been definitely established by numerous tests made by the Underwriters' Laboratories, Inc., and by the bureau of buildings in many of the larger cities.

Note: *See the results of the Underwriters' Laboratories Fire and Water Tests in the following reports: Retardant Reports No. 378 (June 22, 1910), No. 1095 (April, 1918), No. 973 (July 17, 1918). Other authentic reports will be furnished on application.*

The temperature of the slab (whether of poured or precast gypsum or Structolite) cannot exceed 212° F. except on the surface exposed to the fire. This is due to the fact that the water of crystallization in the gypsum is vaporized during the application of fire to it, and as the gypsum slowly calcines, the cellular structure fills with steam. It is this barrier of calcined material which stubbornly resists the progress of the fire.

Light Weight

Gypsum is the lightest of the structural building materials, having approximately 40% of the weight of concrete.

Where used structurally in floor and roof slabs the light weight of gypsum, combined with strength, reflects decided economies in all supporting members including foundations—savings which frequently amount to formidable sums when freight, haul, hoist, erection and interest on the investment are properly considered.

Insulation

Gypsum with its close knit air confining cells has the highest insulating value of any fireproof cementitious structural building material. It thus combines insulation and strength in one homogeneous substance.

Present day efficiency of plant operation demands a non-combustible roof deck which conserves heat in winter, and maintains cool working conditions even in the hottest summer weather. Gypsum roof constructions fulfill this demand at a minimum cost.

Heat losses through gypsum roof decks are minimized, and the temperature at the undersurface of the roof remains practically the same as the interior of the building, regardless of outside temperature. This tends to eliminate condensation or "sweating" and dripping under moist air conditions.

For "Gypsum Insulation Data," see below.

Resistance to Sulphur Gases

As sulphur dioxide gas is commonly encountered in manufacturing plants, power plants, forge shops, foundries, roundhouses, etc., roofs, particularly, are often subjected to very severe acid conditions when in combination with high humidity. Most structural materials are readily and rapidly attacked by sulphur dioxide gas, resulting in disintegration and ultimate failure.

Authentic tests upon reinforced gypsum roof constructions indicate that under continuous subjection to sulphur fumes the gypsum mass actually increases in strength. The steel reinforcing is treated to prevent progressive corrosion.

Conclusive test data will be furnished on application.

GYPSUM INSULATION DATA

Heat Conductivity Coefficients

In order to appreciate fully the superiority of gypsum as an insulator, it is necessary to understand the principle underlying the calculation of heat losses through various materials.

The amount of heat transmitted through a roof is calculated from the following formula, which combines: (1) the admission of heat from the air into the surface of the roof; (2) the transmission of heat through the roof; and (3) the emission of heat from the other surface of the roof into the air.

$$U = \frac{1}{\frac{1}{K1} + \frac{1}{K2} + \frac{X1}{C1} + \frac{X2}{C2} + \frac{X3}{C3} + \text{etc.}}$$

U = B.t.u.'s transmitted per hour per square foot per degree difference in temperature.
K1 = Inside surface coefficient (average).
K2 = Outside surface coefficient with 15 miles per hour wind (average).
X = Thickness of individual material, in inches.
C = Coefficient of conductivity per inch thickness of individual materials, per hour, per sq. ft., per degree difference.

The following table gives the coefficient of K1 and K2 generally used, together with the coefficient C for a number of materials as determined by recognized authorities, as given in A.S.H.&V.E. Guide.

K1—Average	1.34	(B.t.u.'s)
K2—Average	4.02	(B.t.u.'s)
C—Values per inch thickness, except as noted:		
Stone Concrete (1-2-4 Mix)	8.3	(B.t.u.'s)
Cinder Concrete	5.2	(B.t.u.'s)
Pine Plank	1.00	(B.t.u.'s)
Red Top Insulating Board	0.32	(B.t.u.'s)
Gypsum Fiber Concrete (Pyrofill)	1.66	(B.t.u.'s)
Sheetrock or Plasterboard (per ⅜ in. thickness)	3.6	(B.t.u.'s)
(Precast) Gypsum Roof Tile	2.4	(B.t.u.'s)
5 Ply Tar and Gravel Roofing	1.325	(B.t.u.'s)

In considering the actual insulating value of a roof it should be borne in mind that with gypsum a homogeneous, structural, fireproof slab is provided.

Heat Saving (Examples)

The following example shows the saving made possible by the use of a 3-in. Sheetrock-Pyrofill roof in place of a 3-in. concrete roof slab.

Assume a building of 100,000 sq. ft. of roof area in which it is necessary to maintain a constant inside temperature of 70° F. twelve hours per day. The lowest outside temperature will be assumed as 0° F. and the number of days requiring heat 210.

The total heat loss through the gypsum roof will be .318 × 100,000 × 70 × 12 = 26,700,000 B.t.u.'s per 12-hour day. The total heat loss per year (210 heating days) is 26,700,000 × 210 = 5,600,000,000 B.t.u.'s.

On the same basis of calculations, the heat loss due to 3-in. concrete roof will be .61 × 100,000 × 70 × 12 × 210 = 10,760,000,000 B.t.u.'s per year (210 heating days). (See table on page 3 for heat transmitted through these roofs.)

The amount of heat saved by the use of gypsum is the difference, or 5,160,000,000 B.t.u.'s assuming that an outside temperature of zero will be constant throughout the 210 days. However, actual tests by heating engineers indicate that the actual saving is about 30% of the above, due to the fact that the average outside temperature during the 210 heating days is considerably above zero.

Therefore the actual saving is 30% of B.t.u.'s 5,160,000,000 = 1,550,000,000 B.t.u.'s.

Fuel Saving (Example)

Assuming the use of a grade of industrial coal producing 8,000 B.t.u.'s per pound and an efficiency of 70% in the heating plant, the coal saved per year is

$$\frac{1{,}550{,}000{,}000}{8{,}000 \times 2{,}000 \times .70} = 138 \text{ tons of coal}$$

Radiation Saving (Example)

By the same line of reasoning a substantial saving can be effected in the heating equipment. The amount of heat saved per hour by the Sheetrock-Pyrofill roof will be (.61 — .318) × 100,000 × 70° = 2,044,000 B.t.u.'s per hour, at maximum load on heating plant.

A square foot of radiation surface in a steam heating plant operating at a 5-lb. steam pressure will emit 250 B.t.u.'s per hour.

Therefore, the amount of radiation saved is

$$\frac{2{,}044{,}000}{250} = 8{,}176 \text{ sq. ft.}$$

SHEETROCK-PYROFILL ROOF CONSTRUCTION

Description

Note: For "Gypsum—General Technical Data," see page 1.

Note: For Sheetrock, see Sweet's Manufacturers' Index.

General—Sheetrock-Pyrofill System of Roof construction consists of permanent Sheetrock forms and Pyrofill (Gypsum Fiber Concrete) reinforced with an electrically-welded, galvanized steel fabric supported on subpurlins clipped to the main structural steel purlins. It is sold only completely erected by the Contracting Division of the United States Gypsum Company.

Subpurlins—The subpurlins (either tees or light rail sections) are laid at right angles to main purlins and are spaced approximately 32½ in. on centers, varying slightly, dependent on weight of rail and method of fastening used. (See details, pages 5, 6 and 7).

Sheetrock Forms—On the bottom flanges of the subpurlin are laid panels of Sheetrock mill-made in lengths (maximum 10 ft.) equal to the main purlin spacing. All joints on the undersurface are hidden, and a neat, smooth ceiling results. If a greater degree of insulation or greater sound absorption value is desired, Red Top Insulating Board may be substituted for the Sheetrock.

Reinforcement—Consists of a continuous electrically-welded galvanized steel fabric (specially made to U.S.G. specifications) made with No. 12 main longitudinal wires 4 in. on centers and No. 14 transverse wires 8 in. on centers having a section area of .026 sq. in. This reinforcement is laid on top of the Sheetrock with the length (longitudinal wires) at right angles to the subpurlins.

Pyrofill—Pyrofill (Gypsum Fiber Concrete) consists of gypsum stucco and water and not to exceed 12½ lb. of fiber (usually wood planer shavings) to 87½ lb. of calcined gypsum. It weighs but 55 lb. per cu. ft.

Over and bonding to the Sheetrock forms, the Pyrofill is poured, completely surrounding the reinforcement, and screeded to the required thickness.

Curbs, etc.—Curbs above and below monitors or sawtooth sash or elsewhere where required may be constructed of Sheetrock-Pyrofill or Pre-cast Gypsum Tile, the latter reinforced when carrying a roof load or retaining drainage fill.

End Walls, etc.—End walls of monitors, sawtooth skylights, "A" frames, etc., may be constructed of Gypsum Pyrobar Curb Tile (3x15x30 in. non-reinforced).

Adaptability

Although Sheetrock-Pyrofill roof construction is particularly adapted to industrial buildings and garages, it is equally adaptable to school buildings, auditoriums, gymnasiums, theaters, hospitals and hotels. Whenever steel framing is used (whether the roof be flat, pitched, monitor, sawtooth, Pond, Aiken, etc.) the inherent values of this gypsum construction may advantageously be employed. (Under certain conditions the construction may be adapted to roofs of wood framing.)

Outstanding Advantages

Fireproof—See page 1.

Light Weight—See page 2. The tables on pages 4 and 5 indicate the weight of finished slabs and the amount of steel per square foot required for a total load of 45 lb. A careful comparison will show a very worthwhile saving in steel over other constructions.

High Insulation—See insulation data, page 2. In few places is insulation as important a factor as in a roof deck. Here it functions the year around—it promotes comfort and with it efficiency in summer by keeping out the heat of the sun—in winter it materially reduces heat loss. See savings in fuel and radiation given on previous page. Other authentic data on insulation savings applying to any particular installation will be furnished on application.

The Calculated Values for Various Roof Decks

Note: In the table following, the transmission is expressed in B.t.u. per hour, per square foot, per degree difference in temperature. Except as noted, all roof decks are figured with a 5-ply roof covering.

Type of Roof Deck and Covering	
2½-in. Sheetrock-Pyrofill	.35 B.t.u.'s
3-in. Sheetrock-Pyrofill	.318 B.t.u.'s
2½-in. Insulating Board-Pyrofill (½ in. board)	.252 B.t.u.'s
3-in. Insulating Board-Pyrofill (1 in. board)	.182 B.t.u.'s
2-in. Pine Plank	.34 B.t.u.'s
3-in. Stone Concrete	.61 B.t.u.'s
1⅝-in. Cement Tile	.68 B.t.u.'s
Corrugated Sheet Iron (no roof covering)	1.50 B.t.u.'s

Note: For heat conductivity coefficients and formula, see page 2.

Good Interior Appearance—The light color and texture of the paper-finished surface of the Sheetrock, without further finish, is neat and attractive. (The supporting subpurlins are given a shop coat to harmonize with the Sheetrock.)

Note: If the underside of the slab is to be painted or otherwise decorated, such work should not be done until the waterproof roof covering has been applied and the slab is thoroughly dry.

Economical—The simplicity of the construction tends to reduce construction costs. Sheetrock-Pyrofill will be found *very economical* on roof areas of 6,000 sq. ft. or over.

No Maintenance—The maintenance cost of Sheetrock-Pyrofill roof construction is practically nothing. Calcined gypsum is chemically inert. Examinations of steel rods and hooks, embedded for fifteen years in gypsum, have shown no evidence of progressive corrosion.

Economical Construction Suggestions

Length of Span—Usually a span of approximately 8 ft. between main purlins with a 2½-in. slab thickness will be found most economical. Note that no end bay bracing is required.

If channels are used as main purlins on sloping roofs, they should open upwards to permit proper clipping of the subpurlins with our No. 4 purlin clip.

Uniformity of Span—By preserving uniformity of span, the labor costs are reduced and standard lengths of Sheetrock may be used.

Pitch of Roof—While flat roofs require less labor than steep ones, the difference up to 30° pitch is not of sufficient importance to warrant serious consideration. On a roof, however, of 45° or over, it may be necessary to back-form from the top in order to obtain a satisfactory job and this will obviously add to the cost of the roof.

Engineering Service—Our engineering service is always accessible to assist in the greatest economy of design—see page 1.

MASTER SPECIFICATIONS—SHEETROCK-PYROFILL ROOF CONSTRUCTION

Note: Notes are explanatory or advisory only and should not be included in the specifications.

(1) Work Included

Note: Here list the various roof areas to be constructed of Sheetrock-Pyrofill and specify the prescribed live load. If live loads vary, designate the live load applying to the various areas.

(2) Supporting Structural Steel Work

All steel work for the support of the Sheetrock-Pyrofill Roof Construction has been designed not only to carry the prescribed live and dead loads, but to accommodate the most economical installation in accordance with the standard detail of the UNITED STATES GYPSUM COMPANY.

(3) Materials

(3a) General—All Gypsum products shall be as manufactured by the UNITED STATES GYPSUM COMPANY, 300 West Adams Street, Chicago, Ill.

(3b) Subpurlins—Subpurlins shall be steel *(tees) (rails)*

of sizes and spacings required or indicated on the structural plans, furnished with a shop coat of paint. Provide all necessary clips *(of types best suited to conditions)* for rigidly securing subpurlins to main purlins, etc.

(3c) Sheetrock Forms—Sheetrock (⅜ in. thick x 32 in. wide) shall be mill-made to exact lengths (maximum 10 ft.) to match the main purlin centering.

(3d) Reinforcement—Steel reinforcement shall be galvanized electrically-welded steel fabric made to U.S.G. specifications consisting of No. 12 main longitudinal wires 4 in. on centers and No. 14 transverse wires 8 in. on centers having a sectional area of .026 sq. in.

(3e) Pyrofill—Pyrofill shall consist of calcined gypsum and sufficient clean water for proper consistency and not to exceed 12½ lb. of clean soft wood planer shavings to every 87½ lb. of gypsum. It shall be mill mixed.

(3f) Precast Curb Tile—Where so indicated on plans and details furnish 3-in. thick precast gypsum curb tile, (reinforced when carrying a roof load or retaining drainage fill). For end wall construction where so indicated furnish Pyrobar Curb Tile (3-in. x 15-in. x 30-in. non-reinforced).

(3g) Gypsum Mortar—Gypsum mortar shall consist of one part of unfibered gypsum cement plaster and not to exceed two parts of clean sharp sand.

(4) Erection

(4a) General—All Sheetrock-Pyrofill Roof Construction including all subpurlins *(curbs) (end walls) (saddles) (drainage fill)* etc., shall be completely erected by the Contracting Division of the UNITED STATES GYPSUM COMPANY.

Note: *Sheetrock-Pyrofill Roof Construction is only sold completely erected by the* UNITED STATES GYPSUM COMPANY. *For Erection Service see page 1.*

Roof construction shall be of thickness required on plans and details.

All joints in subpurlins shall be staggered or rigidly tied together. Reinforcement shall be continuous. All roof surfaces shall be screeded smooth and true ready to receive the finished waterproof roof covering.

(4b) Poured Curbs—All curbs so indicated on plans and details shall be constructed of Sheetrock-Pyrofill.

(4c) Tile Curbs—All curbs so indicated on plans and details shall be constructed of precast gypsum curb tile (reinforced when carrying roof load or retaining drainage fill) set in gypsum mortar.

(4d) End Walls, etc.—Construct all *(end walls)* of *(monitors) (sawtooth skylights) ("A" frames) (specify)* of Pyrobar Curb Tile set in gypsum mortar.

(4e) Drainage Fill—Provide Pyrofill saddles and drainage pitches to direct roof drainage to *(gutters) (drainage outlets).*

(5) Waterproof Roof Covering

Note: *Provide in the Roofing and Sheet Metal Division of the specifications that the waterproof roof covering shall be applied as soon as possible after the Sheetrock-Pyrofill slab is erected (preferably within twenty days).*

PURLIN SIZES AND WEIGHTS FOR VARIOUS TRUSS AND PURLIN SPACINGS

Based on 45 Lb. per Sq. Ft. Total Load (Live Load—30 Lb.; Slab—12 Lb.; Covering—3 lb.)

Purlin Spacing	Truss Spacing	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.	22 ft.	24 ft.
6 ft.	Size and wt. in lb. of member	5″[-6.7	6″[-8.2	7″[-9.8	7″[-9.8	8″[-11.5	9″[-13.4	10″[-15.3	12″[-20.7
	Wt. of steel in lb. per sq. ft. of roof	1.12	1.37	1.63	1.63	1.92	2.23	2.55	3.45
	Stress in purlin, lb. per sq. in.	14,290	14,070	13,750	17,850	16,970	16,090	15,300	11,430
	Total deflection, in.	.296	.349	.398	.676	.711	.739	.766	.567
7 ft.	Size and wt. in lb. of member	5″[-6.7	6″[-8.2	7″[-9.8	8″[-11.5	9″[-13.4	10″[-15.3	10″[-15.3	12″[-20.7
	Wt. of steel in lb. per sq. ft. of roof	.96	1.17	1.40	1.64	1.91	2.19	2.19	2.96
	Stress in purlin, lb. per sq. in.	16,680	16,420	16,030	15,630	15,230	14,750	17,850	13,320
	Total deflection, in.	.345	.407	.464	.515	.566	.610	.894	.662
8 ft.	Size and wt. in lb. of member	6″[-8.2	7″[-9.8	7″[-9.8	8″I-11.5	9″[-13.4	10″[-15.3	12″[-20.7	12″[-20.7
	Wt. of steel in lb. per sq. ft. of roof	1.03	1.23	1.23	1.44	1.68	1.91	2.59	2.59
	Stress in purlin, lb. per sq. in.	13,020	13,480	18,100	17,870	17,390	16,860	12,780	15,240
	Total deflection, in.	.225	.286	.525	.588	.646	.697	.532	.756
9 ft.	Size and wt. in lb. of member	6″[-8.2	7″[-9.8	8″[-11.5	9″[-13.4	10″[-15.3	8″I-18.4	12″[-20.7	12″[-20.7
	Wt. of steel in lb. per sq. ft. of roof	.91	1.09	1.28	1.49	1.70	2.05	2.30	2.30
	Stress in purlin, lb. per sq. in.	14,650	15,150	15,380	15,430	15,380	17,840	14,380	17,130
	Total deflection, in.	.253	.322	.390	.452	.514	.923	.599	.852
10 ft.	Size and wt. in lb. of member	6″[-8.2	7″[-9.8	8″[-11.5	9″[-13.4	10″[-15.3	12″[-20.7	12″[-20.7	10″[-25.4
	Wt. of steel in lb. per sq. ft. of roof	.82	.98	1.15	1.34	1.53	2.07	2.07	2.54
	Stress in purlin, lb. per sq. in.	16,280	16,850	17,100	17,160	17,070	13,220	15,980	16,650
	Total deflection, in.	.281	.358	.433	.502	.572	.454	.667	.991
11 ft.	Size and wt. in lb. of member	6″[-8.2	7″[-9.8	9″[-13.4	10″[-15.3	8″I-18.4	12″[-20.7	12″[-20.7	12″[-25.
	Wt. of steel in lb. per sq. ft. of roof	.75	.89	1.22	1.39	1.67	1.88	1.88	2.27
	Stress in purlin, lb. per sq. in.	17,900	18,000	14,450	14,820	17,660	14,520	17,590	14,330
	Total deflection, in.	.309	.393	.325	.391	.740	.500	.732	.712
12 ft.	Size and wt. in lb. of member	7″[-9.8	8″[-11.5	9″[-13.4	10″[-15.3	12″[-20.7	12″[-20.7	10″[-25.4	12″[-25.
	Wt. of steel in lb. per sq. ft. of roof	.82	.96	1.12	1.27	1.73	1.73	2.12	2.06
	Stress in purlin, lb. per sq. in.	14,020	15,080	15,760	16,170	12,830	15,870	16,770	15,630
	Total deflection, in.	.208	.231	.355	.426	.358	.547	.838	.777

For loads other than 45 lb. total, stresses and deflections will be directly proportionate to those shown above.

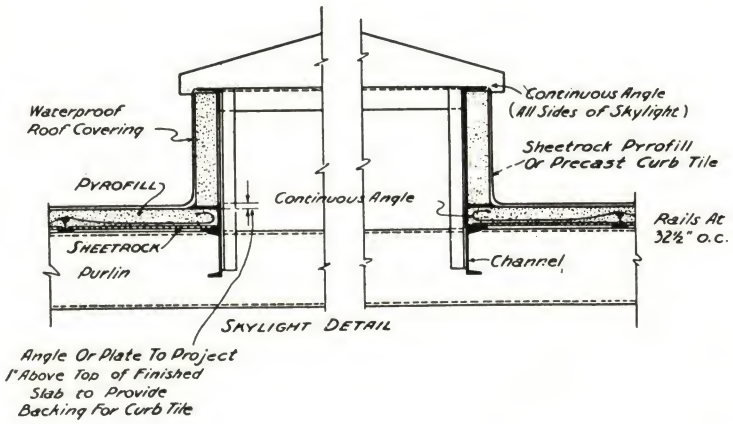
In no case is the deflection, due to live load only, greater than l/360 of the span.

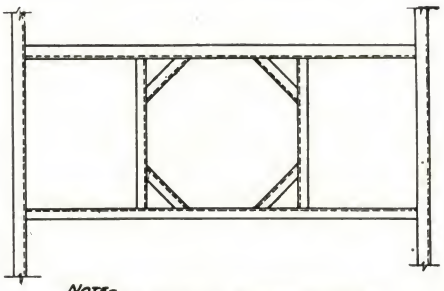
RAIL SIZES AND WEIGHTS OF SLABS

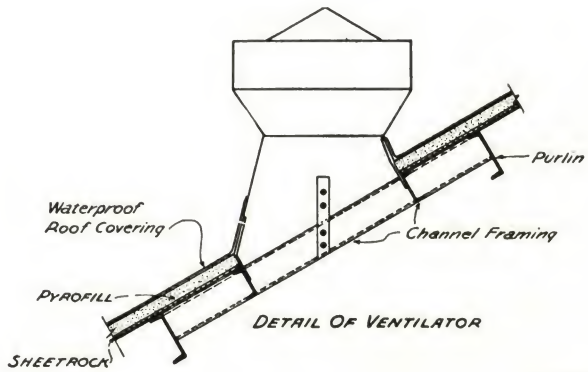
Rails spaced 32½" — 45 Lb. per Sq. Ft. Total Load B.M. = $\frac{1}{10}$ WL; Fiber Stress, 18,000 Lb. per Sq. In.

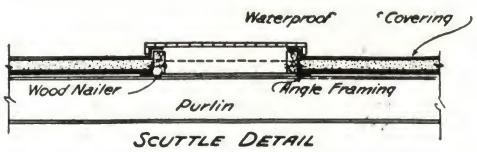
Span of main purlins	Size of rail, lb.	Weight of rail per sq. ft. of roof, lb.	*Minimum thickness of slab, in.	Weight of slab including rail, lb.
Up to 6′-4″	8	1.00	2½	11.50
6′-4″ to 8′-11″	12	1.50	2½	12.00
8′-11″ to 11′-3″	16	2.00	2½	12.50
11′-3″ to 13′-2″	20	2.50	3	15.00

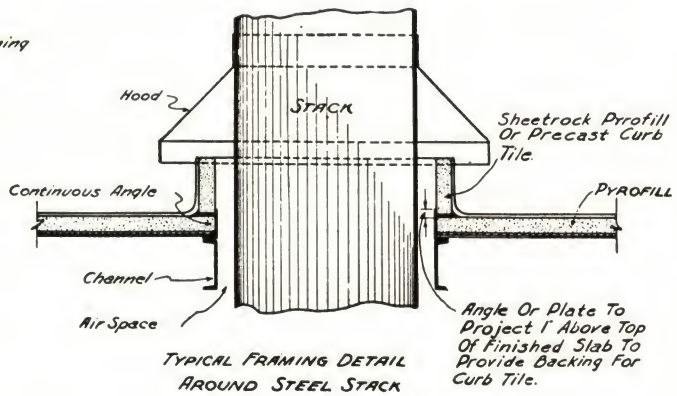
*Includes thickness of Sheetrock. For other spacing of sub-purlins, or other loads, allowable span will vary inversely as the square root of the spacing or the load. Spans can be increased over those shown by considering the effect of the rail imbedment in the slab. Tests have shown that an 8-lb. rail may be used for spans up to 7 ft.





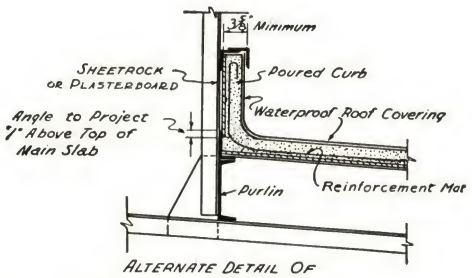




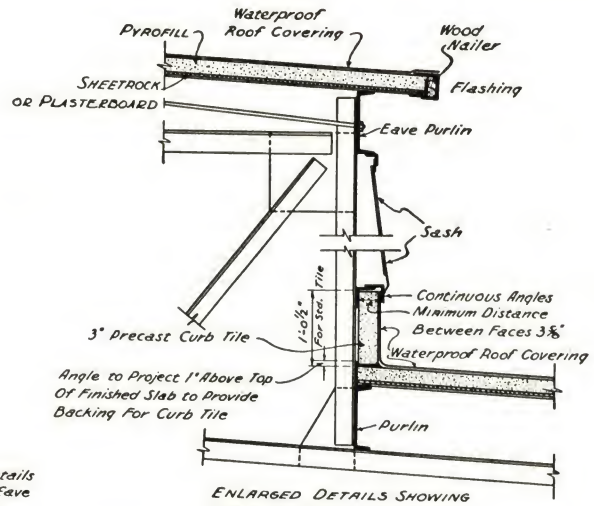


Marks T System Details Similar to Those Above

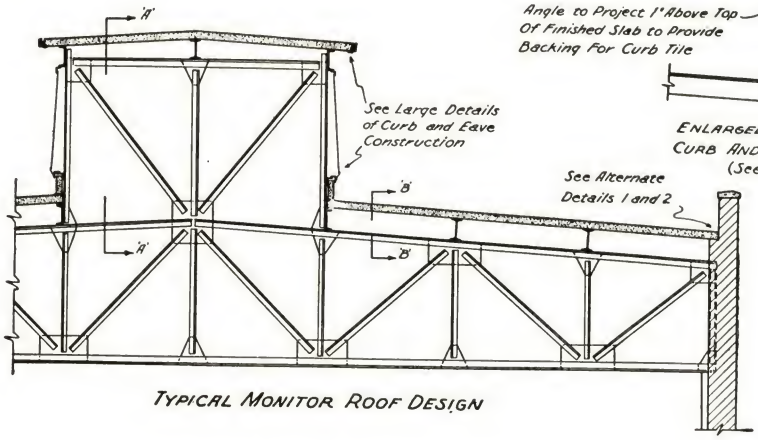
DETAILS—SHEETROCK-PYROFILL AND MARKS T SYSTEMS



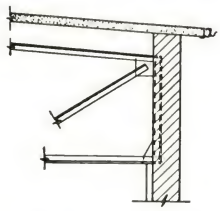
ALTERNATE DETAIL OF POURED CURB CONSTRUCTION



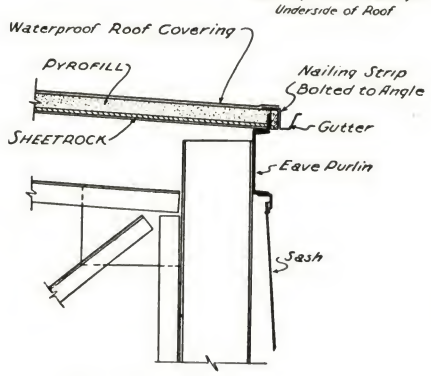
ENLARGED DETAILS SHOWING CURB AND EAVE CONSTRUCTION (See Alternate Detail)



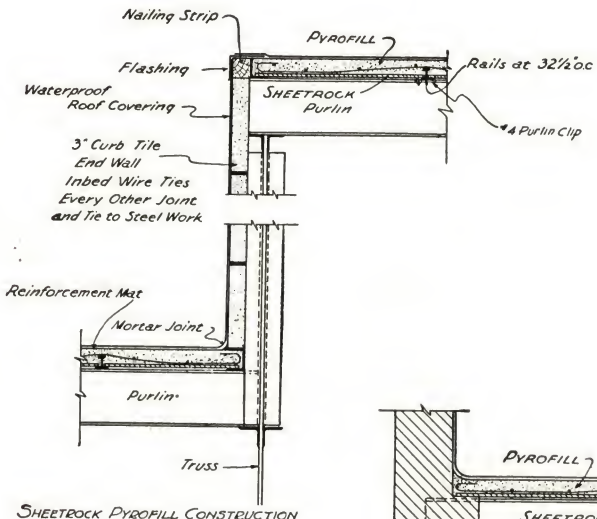
TYPICAL MONITOR ROOF DESIGN



ALTERNATE DETAIL 1
Masonry Wall Extending to Underside of Roof



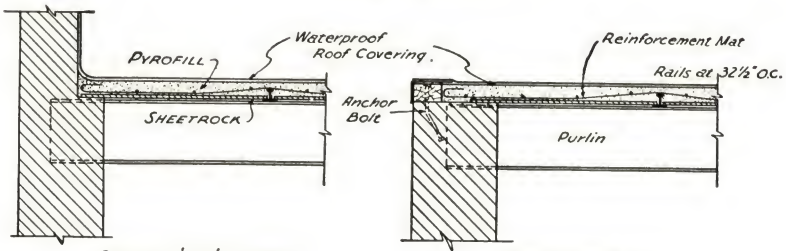
ALTERNATE DETAIL 2
(All Steel Construction)



SHEETROCK PYROFILL CONSTRUCTION

SECTION 'A-A' THRU END WALL OF MONITOR

NOTE- This detail used where monitor does not extend full length of building. When monitor does extend full length of building masonry wall may be carried up to monitor roof and end section would appear as shown in section 'B-B'

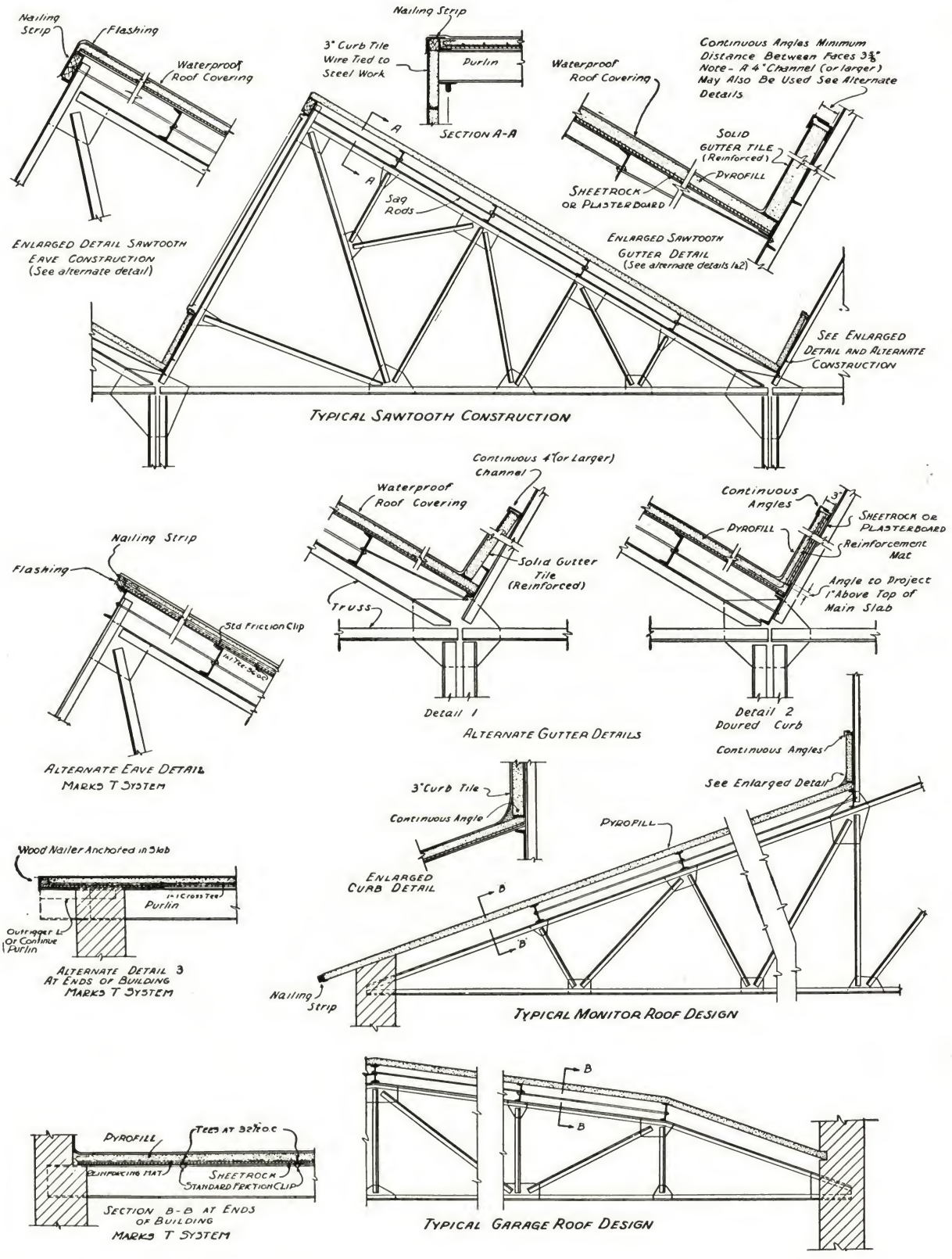


SECTION 'B-B' AT ENDS OF BUILDING

ALTERNATE FOR SECTION B-B

SHEETROCK PYROFILL CONSTRUCTION

DETAILS—SHEETROCK-PYROFILL AND MARKS T SYSTEMS



DETAILS—SHEETROCK-PYROFILL AND MARKS T SYSTEMS

MARKS T SYSTEM OF ROOF CONSTRUCTION

Description

Note: For "Gypsum—General Technical Data," see page 1.

General—Marks T System of Roof Construction is in general quite similar to Sheetrock-Pyrofill Roof Construction. It consists of permanent Plaster Board forms and Pyrofill reinforced with an electrically welded galvanized steel fabric and supporting steel members clipped to the main structural steel purlins. It is sold only completely erected by the Contracting Division of the UNITED STATES GYPSUM COMPANY.

Subpurlins—Large main tees or light rails span from main purlin to purlin, spaced approximately 32½ in. on centers. They carry the construction loads only, being shipped to the job in stock lengths, so as to form with the use of special U connectors, a continuous support from eave to eave. Small 1x1x⅛-in. cross tees, 2 ft. 8 in. long, are laid (not fastened) on the main tees, to support the ends of the gypsum boards, at 3 ft. intervals.

Plaster Board Forms—Over the flanges of the tees are laid standard sheets of plaster board, 32x36 in. All joints are hidden by the tees. Red Top Insulating Board may be substituted for the plaster board.

Reinforcement—Galvanized electrically welded wire reinforcing fabric, of proper width, and cut to the exact length or width of the roof, is laid over the cross tees. The main longitudinal wires, of proper cross-section to support the load in combination with the gypsum, span from main purlin to purlin, spaced 4 in. on center. The transversed wires are spaced 12 in. on center.

Pyrofill—Gypsum Fiber Concrete is used as fully described on page 3 for Sheetrock-Pyrofill Construction.

Curbs, End Walls, etc.—In general, the same as described on page 3 for Sheetrock-Pyrofill Construction.

Combination Sheetrock-Pyrofill and Marks T System

If desired, the small cross tees and plaster board can be used in place of Sheetrock in the standard Sheetrock-Pyrofill Construction.

Adaptability

The Marks T System of Roof Construction is adapted to the same classes and types of buildings as Sheetrock-Pyrofill Construction. See page 3.

Outstanding Advantages

The outstanding advantages given on page 3 applying to Sheetrock-Pyrofill Construction apply likewise to the Marks T Construction. The insulation values given for Sheetrock-Pyrofill Construction are identical with those for the Marks T System.

The Marks T System is especially adapted to rush jobs, as the tees and plaster board are of standard length and sizes and are carried in stock, fabricated, ready for immediate shipments.

Economical Construction Suggestions

Length of Span—Usually a span of approximately 5½ to 6½ ft. (depending upon the live load) will be found most economical, permitting the use of a 2½-in. slab thickness. Note that no end bay bracing is required. If channels are used as main purlins, on sloping roofs, they should open upwards to permit proper clipping of the subpurlins with our No. 4 purlin clip.

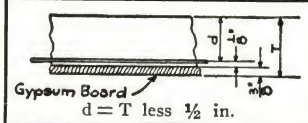
Pitch of Roof—Same as for Sheetrock-Pyrofill Construction given on page 3.

Purlin Sizes and Weights—The table given on page 4 giving "Purlin Sizes and Weights for Various Truss and Purlin Spacings" applying to Sheetrock-Pyrofill Construction applies likewise to the Marks T Construction.

Engineering Service—Our Engineering Service is always accessible to assist in the greatest economy of design. See page 3.

Safe Loads—Marks T Construction

Thickness of slab, in. = T	Weight of slab, lb. per sq. ft.	Galvanized welded-wire reinforcement: Gauge	Diameter, in.	Spacing in.	As	Span of slab in feet (center to center of purlins): 4	4½	5	5½	6	6½	7	7½	8	8½	9
						Safe superimposed loads in pounds per sq. ft. (weight of slab has been deducted)										
2½	11.5	8	0.1620	4	0.0618	68	52	40	31	24	...	...	...	...	...	...
		7				73	56	43	34	27	...	...	...	...	...	...
		6				78	60	46	36	29	23	...	...	...	...	...
		5				83	63	49	39	31	24	...	...	...	...	...
3	13.5	8	0.1770	4	0.0738	101	77	60	48	38	30	24	...	...	...	...
		7				109	83	65	51	41	33	27	...	...	...	...
		6				116	89	70	55	44	36	29	24	...	...	...
		5				123	95	74	59	48	39	31	26	...	...	...
		4				131	101	79	63	51	42	34	28	...	...	...
3½	15.5	7	0.1920	4	0.0869	150	115	90	72	58	47	39	32	26	...	...
		6				...	123	96	77	63	51	42	35	29	24	...
		5				...	131	103	83	67	55	45	37	31	26	...
		4				...	139	110	88	72	59	49	41	34	28	...
	17.5	6	0.2070	4	0.1010	...	161	127	102	83	68	56	47	39	33	27
		5				...	...	135	109	89	73	61	51	42	36	30
		4				...	...	144	116	95	78	65	55	46	39	33
4½	19.5	5	0.2253	4	0.1196	...	...	...	137	112	93	77	65	55	46	39
		4				...	...	...	147	120	100	83	70	59	51	43
		3	0.2437		0.1399	...	...	...	157	128	107	89	75	64	55	47



d = T less ½ in.

Note: The load capacities as shown herewith are based on reinforced slab figures only. An additional factor of safety is obtained in this system by the use of the structural members in the permanent form.

MASTER SPECIFICATIONS—MARKS T SYSTEM

Note: Follow general form for Sheetrock-Pyrofill Specifications given on pages 3, 4 and 5, except as here corrected and amended.

(1) Work Included

Same as par. (1), page 3, except substitute "Marks T" for "Sheetrock-Pyrofill."

(2) Supporting Structural Steel

Same as par. (2), page 3, except substitute "Marks T" for "Sheetrock-Pyrofill."

(3) Materials

(3a) General—*Same as par. (3a), page 3.*

(3b) Subpurlins—*Same as par. (3b), page 3.*

(3c) Plaster Board Forms—Plaster Board Forms shall be cut at the mill in sizes ⅜ in. thick by 32x36 in.

(3d) Reinforcement—Steel reinforcement shall be galvanized electrically welded wire reinforcing fabric, with longitudinal wires 4 in. on centers of proper cross section to carry the load for the given span, and with corresponding transverse wire spaced 12 in. on centers.

(3e) Pyrofill—*Same as par. (3e), page 4.*

(3f) Precast Curb Tile—*Same as par. (3f), page 4.*

(3g) Gypsum Mortar—*Same as par. (3g), page 4.*

(4) Erection

(4a) General—*Same as par. (4a), page 4, except substitute "Marks T" for "Sheetrock-Pyrofill."*

(4b) Poured Curbs—*Same as par. (4b), page 4, except substitute "Pyrofill and board" for "Sheetrock-Pyrofill."*

(4c) Tile Curbs—*Same as (4c), page 4.*

(4d) End Walls—*Same as (4d), page 4.*

(4e) Drainage Fill—*Same as (4e), page 4.*

U.S.G. IMBEDDED RAIL CONSTRUCTION

Description

This type of construction is similar to the Sheetrock-Pyrofill roof, in that standard rail subpurlins span from purlin to purlin, over which is laid the same type of reinforcing material. In order, however, to provide an all gypsum undersurface, the Sheetrock or plaster board is eliminated, and removable wooden forms are hung not less than ¾ in. below the top of the purlins, acting as a support for the slab. If desired, the beams can be formed at the same time, and fireproofed with Pyrofill. The undersurface then has the appearance of our Pyrofill Monolithic Suspension Slab, described on pages 20 to 23.

PYROBAR PRECAST ROOF TILE

Description

Note: For "Gypsum—General Technical Data," see page 1.

General—All types of precast roof tiles are made of *Structolite* (see page 1) cast in steel moulds and reinforced with electrically-welded galvanized steel fabric.

Types—Pyrobar Precast Roof Tile are divided into two major groups (1) Short Span Pyrobar Roof Tile, (2) Long Span Hollow Pyrobar Roof Tile.

The Short Span Tile are subdivided into two distinct kinds, varying as follows: 3-in. thick Solid Tile, either 12-in. wide x 30-in. long or 18-in. wide x 36-in. long, weight 17 lbs. per sq. ft.; 4-in. thick Hollow Tile, 12-in. wide x 30-in. long, weight 15.5 lbs. per sq. ft. The 3-in. Solid Tile can be notched if required for pitched roof thrust.

Where the spans are too great to permit the use of the U.S.G. Bulb Tee, we can furnish a Hooked End Roof Tile, for use with either 16-lb. or 20-lb. rails, depending upon the span and live load. Details will be furnished on request.

The Long Span Hollow Tile are furnished in only one thickness of 5¼ in. and 18 in. wide and any length from 4 to 6½ ft. (dependent on economical purlin spacing) with a weight of 23 lbs. per sq. ft. in either butt end or lap end design for I-beam or channel purlins, respectively, notched if required for pitch roof thrust.

For details of each group and their variations, see page 13.

Outstanding Advantages

Fireproof—See page 1.

Light Weight—See page 2.

Structural Strength—The structural strength of Pyrobar Roof Tile is amply demonstrated by actual use of the product in the field over a long period as well as by authoritative tests.

An example of the latter is afforded by the transverse bending tests made on Short Span Tile at Columbia University in 1922. In these tests the load was applied at the third points until failure was produced. For the 3 x 12 x 30-in. Solid Short Span Pyrobar Tile, the total load applied at the third point averaged 1020 lb. This represents an equivalent uniformly distributed load of 545 lb. per sq. ft. From the above it is seen that the factor of safety afforded by Pyrobar Roof Tile is more than sufficient for the purpose.

Complete test data will be furnished on request.

High Insulation—See page 2. One of the determining factors in the introduction of Pyrobar Roof Tile more than fifteen years ago was its high insulation value effectively *reducing condensation* and *saving fuel.* Authentic data on insulation savings will be furnished on application.

The Calculated Values for Various Roof Decks

Note: In the table following, the transmission is expressed in B.t.u. per hour per square foot per degree difference in temperature. All roof decks are figured with 5-ply roof covering.

3-in. Solid Short Span Pyrobar	.41 B.t.u.'s
4-in. Hollow Short Span Pyrobar	.35 B.t.u.'s
5¼-in. Long Span Hollow Pyrobar	.29 B.t.u.'s

Not Attacked by Sulphur Gases—See page 2.

Good Interior Appearance—The interior appearance is neat and the surface an excellent light reflector.

Economical—Pyrobar Roof Tile are low in cost and permanent. The large lightweight units are easily and speedily erected in any kind of weather in which it is possible to work. The tile are laid directly on the supporting steel work and require only the grouting of joints to make the roof ready for the waterproof covering. This can follow immediately, materially shortening the construction period and making possible earlier occupancy. Maintenance cost is practically nothing.

Broad Adaptability

There is a type of Pyrobar Roof Tile to meet every requirement. The various types and spans are adapted to all kinds of steel framework as they are easily cut to fit around skylights, ventilators, stacks, etc. They are also suited to meet the hip and valley construction of steep pitched roofs, curved surfaces and intricate roof designs and to take slate, tile and metal roof covering. Coupled with the insulating qualities its resistance to sulphur dioxide fumes makes Pyrobar Roof Tile the logical choice for railroad as well as any industrial buildings where this condition must be given first consideration.

The particular adaptability of each type of tile is given in detail below and on next page.

Short Span Pyrobar Roof Tile

Note: For sizes and varieties see "Types" under "Description" in opposite column above. For details see page 13. For curbs, walls, drainage fill, etc., see page 10.

Adaptability—The 3-in. Solid is recommended particularly for nailing purposes because it assures maximum penetration and thus the greatest nail-holding ability. The 4-in. Hollow fills all requirements for a light weight tile to be covered with a built-up roof covering. It is not recommended for nailing purposes. Both tile give a flat ceiling. The short span tile construction is by far the most flexible of any precast system. It can be used with economy on any type of factory or industrial building, power plant, school, etc., and in addition is particularly well adapted to steep pitched roofs or roofs that are badly cut up with dormers, hips, valleys and difficult intersections.

Reinforcement—Reinforcement consists of an electrically welded galvanized steel mat. Details of the reinforcement will be furnished on request. See page 13.

Purlin Requirements—Short Span Roof Tile require subpurlin supports. These are usually Tees (such as U.S.G. Bulb Tees) but light I-beams or channels may be used with economy on spans up to 12 ft. The most economical span for the U.S.G. Bulb Tees with 30-in tile is 7 ft., 4 in. and 6 ft., 9 in. with 36-in. tile. A notched 3-in. solid tile laid directly on light I-beam purlins which span directly between steel trusses or main supports has proven economical in many cases. Note that no end bay bracing is required.

Special U.S.G. Bulb Tee Subpurlins—This section has been developed primarily for use with Short Span Pyrobar Roof Tile, as a more economical subpurlin than standard tees. The wide flange provides ample bearing for the tile, and being designed particularly for this purpose, it has considerably less sectional area than a standard tee of equal load bearing capacity. The United States Gypsum Company is prepared to furnish the bulb tees, erected in place in connection with its installation of Short Span Pyrobar Roof Tile, or, if desired in connection with your own installation of Pyrobar the bulb tee can be furnished fabricated for erection with the structural steel. See details, page 13.

Installation—The tile are laid directly on the steel supports without mortar and with sides tight together with full bearing on the subpurlin. The grouting joints are then filled with gypsum mortar and the roof is immediately ready for the application of the roof covering.

Ornamental Roof Covering—A successful application of ornamental roof covering depends upon density of the slab (3-in. Solid tile is recommended) type and penetration of nail, type of covering and slope of the roof. The recommendations of the manufacturer of the particular roofing should be followed. The roof deck should be thoroughly dry or as nearly so as can be reasonably obtained. Square cut hard copper or brass nails have proven their superiority after a large number of tests on all types.

Application of ordinary slate or ornamental tile to roofs up to 60° slope should be made with nails having not less than 2 in. penetration. When the slope is greater than 60° or extra heavy slate or tile is to be fastened, the problem requires special study with any type of nailing deck.

Application of sheet metal (tin or copper) requires thoroughly rigid fastening due to the strain put upon the cleat nails by the expansion and contraction of the sheets. Particularly, there should be sufficient cleats to securely anchor the sheets to the roof construction. Standard practice indicates that the spacing of cleats should be approximately 8 in. on centers, each secured with two nails having not less than 2-in. penetration as mentioned above.

It is standard practice to use a sheet of roofing felt between the gypsum roof deck and the ornamental covering, whether of slate, tile or metal.

Long Span Hollow Roof Tile

Note: For sizes and varieties see "Types" under "Description," page 9. For details see page 13. For curbs, walls, drainage fill, etc., see below.

Adaptability—Long Span Hollow Pyrobar Roof Tile are primarily designed to provide a flat uniform ceiling with maximum light reflection and insulation. They are manufactured in lengths 4 ft. to 6 ft. 6 in. to suit the steel framing, and 5¼-in. deep. The tile can be notched to fit over the purlin flanges if desired, and can be furnished either with or without lap joint, depending on the bearing afforded. Lap joint should be used whenever channel purlins are provided. Long Span Tile are not recommended for roofs with difficult framing requiring considerable cutting, nor where a nailing deck is required.

Reinforcement—Consists of an electrically-welded, galvanized steel mat, properly designed to support the load, as shown on details, page 13.

Purlin Requirements—The tile are made to span from purlin to purlin (either steel or wood)—no tees or other type of subpurlins are required. The most economical purlin spacing is approximately 6 ft. Spacing may vary from 4 ft. to not to exceed 6½ ft.

Installations—The tile are laid directly on the steel subpurlins or wood framing with sides tight together. The grouting joints on the top surface are then filled with gypsum mortar and the roof is immediately ready for the application of the roof covering. See table, page 11.

Gutter and Curb Tile, Drainage Fill

Gutter Tile—Sawtooth valleys, curbs under sawtooth sash, etc., restraining drainage fill or subject to roof loads, are constructed of 3-in. solid reinforced Pyrobar Gutter Tile, 12 in. wide and made in lengths to fit the steel work.

Curb Tile—Curbs, above and below monitor and sawtooth sash, end walls, etc., which do not sustain a superimposed roof load or restrain drainage fill are constructed of 3-in. solid non-reinforced Pyrobar Curb Tile, 15x30 in.

Drainage Fill—The use of Pyrofill (see (4e) page 4) for drainage fill over Pyrobar roofs, is ideal on account of its light weight and the quick setting qualities of gypsum. Where deep fill is required the Pyrofill is laid over dry cinders tamped in place. The Pyrofill provides a smooth surface for the roof covering and is an excellent material for constructing fillets and leveling off uneven and broken surfaces, in connection with difficult roof framing.

Re-roofing

All types of Pyrobar Roof Tile, particularly the Short Span Tile, provide a solution of the re-roofing problem. The desired area on the old roof can be removed and replaced immediately with Pyrobar, without interrupting the activities below.

In connection with re-roofing work, the UNITED STATES GYPSUM COMPANY through its Contracting Division will remove the old roof deck or covering, furnish and place additional steel if required, and erect the new Pyrobar Roof Deck, ready for the roof covering. Our wide experience in this field is at your service.

Economical Construction Suggestions

The Proper Steelwork Design—The proper design and detail of the steelwork to best accommodate the roof tile cannot be too strongly emphasized. Sufficient bearing for the tile is very essential. A channel or double angles are usually required at the upper edge of the curb tile to form a sill for sash and also to hold the tile in place. If the curb tile is on a slope or sustains a superimposed load such as drainage fill, an angle should be used at the lower edge. Stop angles to prevent sliding of roof tile on a steep pitch are necessary.

On sloping roofs, if channels are used for main purlins, they should open upwards in order to permit proper clipping of the subpurlins. See details, page 13.

We recommend the use of tie rods for all roofs using channel purlins regardless of the slope or pitch.

Curb tile under sash, skylight frames, etc., are made in a standard size of 3x15x30 in. and the designer should arrange the steel work to accommodate either the full 15 or 30-in. dimension.

Note: If the above is impossible, these tile can be furnished in 15-in. widths with lengths to fit the steel.

On page 13 will be found details and weights of the various types of precast roof tile. On pages 11 and 12 are tables giving the size, stress, deflection and square foot weight of purlins under various conditions of truss spacing and tile lengths.

The use of these data together with the construction details given on pages 14, 15, 16 and 17 will be of assistance to the designer.

By following standard practice and conforming to the manufacturer's details and specifications, special sizes of tile and difficult conditions will be reduced to a minimum and economy will naturally follow.

Openings—Openings larger than 12 in. must be provided with suitable framing. The tile are readily cut to fit around openings of any size.

This applies particularly to openings for ventilators. Construction details on page 16 show methods of attaching ventilators to precast and poured roof construction. Where ventilators are installed after the roof has been constructed, the details should be referred to our Engineering Department.

Lap Joint Tile—For Long Span Tile, when channel purlins are used, lap joint tile must be used. See details, page 13.

Notched Tile—Our standard practice permits notching Solid Short Span Tile and Long Span Hollow Tile to eliminate thrust on pitched roofs. See details, page 13.

Engineering Service—Our engineering service is always accessible to assist in the greatest economy of design—see page 1.

MASTER SPECIFICATIONS—PYROBAR PRECAST ROOF TILE

Note: Notes are explanatory or advisory only and should not be included in the specifications.

(1) Work Included

Note: Here list the various roof areas to be constructed of Pyrobar Precast Roof Tile and specify the prescribed live load. If more than one type of tile is used list separately the areas constructed of each.

(2) Supporting Structural Steel Work

All steel work for the support of the Pyrobar Precast Roof Tile Construction has been designed not only to carry the prescribed live and dead loads, but to accommodate the most economical standard tile installation in accordance with the standard details of the UNITED STATES GYPSUM COMPANY.

Note: See particularly "Purlin Requirements" and "Special U.S.G. Bulb Tee Subpurlins" under heading "Short Span

Pyrobar Roof Tile," page 9; "Purlin Requirements" under heading "Long Span Hollow Roof Tile," above, and heading "Economical Construction Suggestions," above.

(3) Materials

(3a) General—All Gypsum products shall be as manufactured by the UNITED STATES GYPSUM COMPANY, 300 West Adams Street, Chicago, Ill.

(3b) Short Span Tile—Where so designated the roof slab shall be constructed of Pyrobar Short Span *(Solid) (Hollow) (Notched End)* Roof Tile.

Note: *See "Types" under heading "Description," also "Short Span Pyrobar Roof Tile" on page 9.*

(3c) Special U.S.G. Bulb Tee Subpurlins—All subpurlins shall be special U.S.G. Bulb Tees.

(3d) Long Span Hollow Tile—Where so designated the roof slab shall be constructed of 5¼-in. Pyrobar Long Span Hollow *(lap end) (notched end)* Roof Tile.

Note: *See "Types" under heading "Description," page 9, and "Long Span Hollow Roof Tile," page 10.*

(3e) Precast Gutter and Curb Tile—Where so indicated on plans and details furnish reinforced Gypsum Gutter Tile (3x12 in. by lengths as required) to restrain drainage fill or carry roof loads. Furnish also all necessary non-reinforced Gypsum Curb Tile (3x15x30 in.) for curbs, walls, etc., which do not carry roof loads or restrain drainage fill.

Note: *See "Gutter and Curb Tile," page 10.*

(3f) Gypsum Mortar—Gypsum mortar shall consist of one part of unfibered gypsum cement plaster and not to exceed two parts of clean, sharp sand.

(3g) Pyrofill—Pyrofill (Gypsum Fiber Concrete) shall consist of calcined gypsum and sufficient clean water for proper consistency and not to exceed 12½ lbs. of clean soft wood planer shavings to 87½ lbs. of gypsum.

Note: *See "Drainage Fill," page 10.*

(4) Erection

(4a) By United States Gypsum Company—All Pyrobar Precast Roof Tile Construction, including all *(U.S.G. bulb tee subpurlins) (curbs) (end walls) (saddles) (drainage fill),* etc., shall be completely erected by the Contracting Division of the UNITED STATES GYPSUM COMPANY.

Note: *For Erection Service see page 1.*

(4b) General—All Pyrobar Precast Roof Tile shall be accurately laid, without mortar, upon the supporting steel work. Bearings shall be even and full and the tile units laid tight. All joints on top surface shall be pointed full with gypsum mortar, struck smooth. All roof surfaces shall be left smooth and true ready to receive the finished waterproof roof covering.

(4c) Tile Curbs—All curbs so indicated on plans and details shall be built of Precast Curb Tile (reinforced when restraining drainage fill or carrying roof loads). Tile shall be laid in gypsum mortar.

(4d) End Walls, etc.—Where so indicated on plans and details, construct all *(end)* walls of *(monitors) (sawtooth skylights) ("A" frames)* etc. of Pyrobar Curb Tile set in gypsum mortar.

(4e) Saddles and Drainage Fill—Provide Pyrofill saddles and drainage pitches to direct roof drainage to *(gutters) (drainage outlets).* Where deep fill is required, build the fill of clean dry cinders thoroughly tamped, finished with a surface of Pyrofill.

(5) Waterproof Roof Covering

Note: *Provide in the Roofing and Sheet Metal division of the specifications that the waterproof roof covering shall be applied as soon as possible after the gypsum roof slab is erected (preferably within twenty days).*

Note: *For application of ornamental roofing, such as slate, tile and metal see recommendations given in "Ornamental Roof Covering" under heading "Short Span Roof Tile," page 10.*

PURLIN SIZES AND WEIGHTS FOR VARIOUS TRUSS AND PURLIN SPACINGS

Based on 50 Lb. per Sq. Ft. Total Load—(Live Load—30 Lb.; Slab—17 Lb.; Covering—3 Lb.)
Note: Long Span Tile is not furnished for spans over 6 ft. 6 in.

Purlin Spacing	Truss spacing	8 ft.	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.	22 ft.	24 ft.
4 ft.	Size and wt. in lb. of member	4"[-5.4	4"[-5.4	5"[-6.7	6"[-8.2	7"[-9.8	7"[-9.8	8"[-11.5	9"[-13.4	9"[-13.4
	Wt. of steel in lb. per sq. ft. of roof	1.35	1.35	1.67	2.05	2.45	2.45	2.88	3.35	3.35
	Stress in purlin, lb. per sq. ft.	10,510	16,420	15,180	14,100	13,230	16,750	15,430	14,350	17,080
	Total deflection, in.	.174	.424	.452	.476	.502	.802	.799	.798	1.131
5 ft.	Size and wt. in lb. of member	4"[-5.4	5"[-6.7	6"[-8.2	6"[-8.2	7"[-9.8	8"[-11.5	9"[-13.4	9"[-13.4	10"[-15.3
	Wt. of steel in lb. per sq. ft. of roof	1.08	1.34	1.64	1.64	1.96	2.30	2.68	2.68	3.06
	Stress in purlin, lb. per sq. ft.	13,120	13,180	12,980	17,630	16,550	15,610	14,820	17,950	16,780
	Total deflection, in.	.217	.273	.322	.595	.627	.653	.683	.998	.999
6 ft.	Size and wt. in lb. of member	4"[-5.4	5"[-6.7	6"[-8.2	7"[-9.8	8"[-11.5	9"[-13.4	9"[-13.4	10"[-15.3	12"[-20.7
	Wt. of steel in lb. per sq. ft. of roof	.90	1.12	1.37	1.63	1.92	2.23	2.23	2.55	3.45
	Stress in purlin, lb. per sq. ft.	15,750	15,800	15,550	15,170	14,830	14,380	17,780	16,890	12,630
	Total deflection, in.	.262	.327	.386	.441	.491	.535	.820	.847	.627
6 ft. 6 in.	Size and wt. in lb. of member	4"[-5.4	5"[-6.7	6"[-8.2	7"[-9.8	8"[-11.5	9"[-13.4	10"[-15.3	8"I-18.4	12"[-20.7
	Wt. of steel in lb. per sq. ft. of roof	.83	1.03	1.26	1.51	1.77	2.06	2.35	2.83	3.19
	Stress in purlin, lb. per sq. ft.	17,080	17,120	16,850	16,430	15,980	15,570	15,120	17,340	13,680
	Total deflection, in.	.282	.354	.418	.477	.532	.579	.627	1.078	.678
7 ft.	Size and wt. in lb. of member	4"[-5.4	5"[-6.7	6"[-8.2	7"[-9.8	8"[-11.5	9"[-13.4	10"[-15.3	12"[-20.7	12"[-20.7
	Wt. of steel in lb. per sq. ft. of roof	.77	.96	1.17	1.40	1.64	1.91	2.19	2.96	2.96
	Stress in purlin, lb. per sq. ft.	18,000	18,000	17,850	17,700	17,200	16,780	16,290	12,430	14,730
	Total deflection, in.	.304	.375	.450	.513	.572	.624	.677	.516	.731
8 ft.	Size and wt. in lb. of member	.....	6"[-8.2	7"[-9.8	8"[-11.5	9"[-13.4	10"[-15.3	8"I-18.4	12"[-20.7	12"[-20.7
	Wt. of steel in lb. per sq. ft. of roof	.....	1.02	1.23	1.44	1.68	1.91	2.30	2.59	2.59
	Stress in purlin, lb. per sq. ft.	.....	14,400	14,920	15,110	15,120	15,080	17,570	14,220	16,830
	Total deflection, in.	.....	.249	.317	.383	.447	.504	.906	.588	.836

For loads other than 50-lb. total, stresses and deflections will be directly proportionate to those shown above. Thus a lighter load or consideration of only live load deflection will permit the use of a considerably lighter section. In no case is the deflection, due to live load only, greater than 1/360 of the span.

SUBPURLIN SIZES FOR PURLIN SPANS UP TO 8 FT. 5 IN.

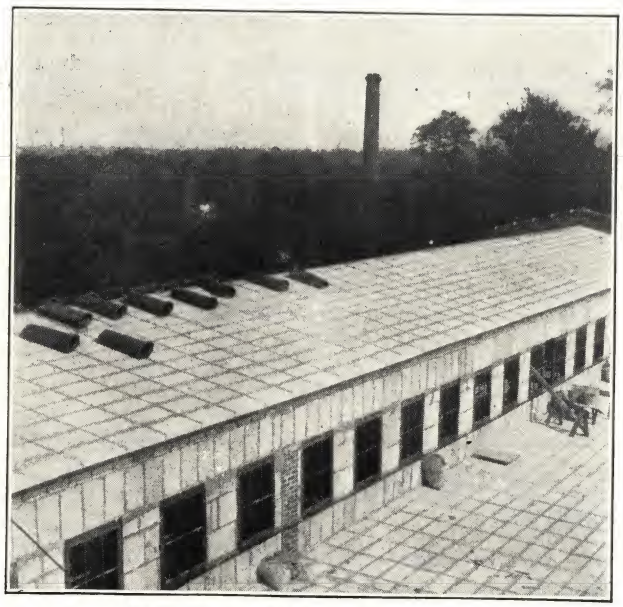
Used with Short Span Tile, Solid and Hollow—18,000-lb. Stress

Spaced 30¾ in. on Centers — 50 lb. per Sq. Ft. Total Load — BM = $\frac{1}{10}$ WL

Span	6′ 1″	6′ 11″	7′ 9″	8′ 5″
Size of tee	2¼x2¼—4.1 lb.	2¼x2¼—4.9 lb.	2½x2½—5.5 lb.	2½x2½—6.4 lb.

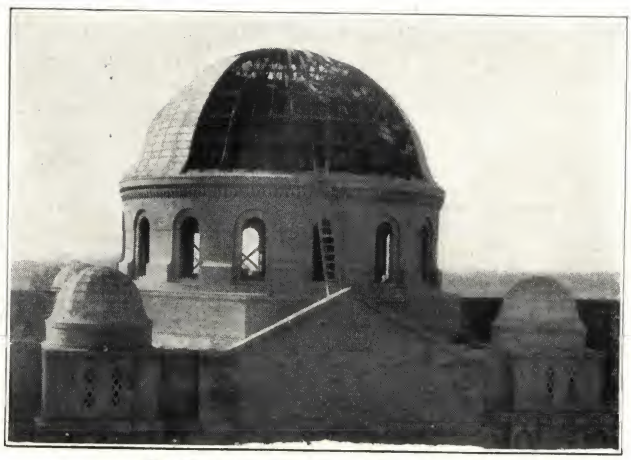
U.S.G. Bulb Tee—3.1 Lb.—1.25 lb. Steel per sq. ft. of roof—Span to 7′-4″ (6′-9″ for 36¾″ O. C.)

For other spacing of subpurlins, or other loads, allowable span will vary inversely as the square root of the spacing or the load.

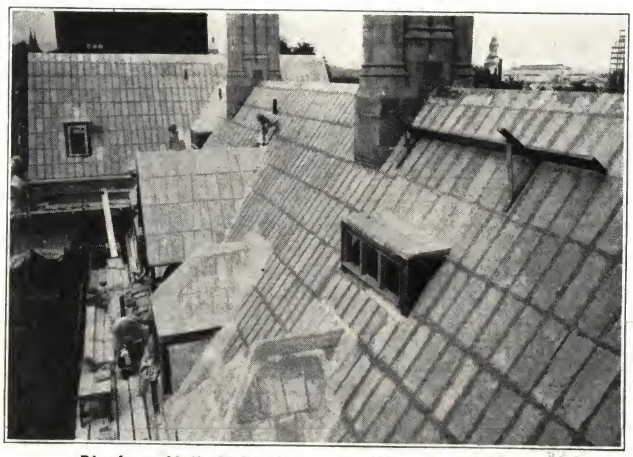


Incinerator Plant, City of Baltimore, Md.
Note the Pyrobar Curb and Monitor Wall Construction

Williams College Library, Williamstown, Mass.
Cram & Ferguson, Architects
14,000 sq. ft. Short Span Pyrobar



St. Casimir's Church, Buffalo, N. Y.
Oakley & Shallmo, Architects
6400 sq. ft. Short Span Pyrobar



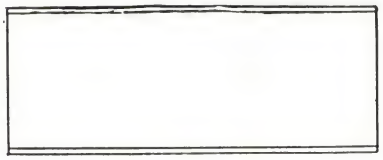
Bingham Hall, Yale University, New Haven, Conn.
W. B. Chambers, Architect
11,755 sq. ft. Short Span Pyrobar

TYPICAL INSTALLATIONS—PYROBAR ROOF TILE

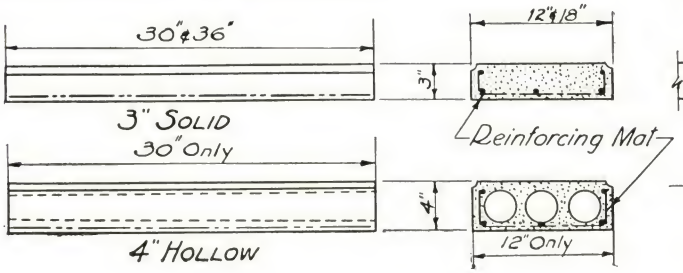
DETAILS OF PYROBAR ROOF TILE

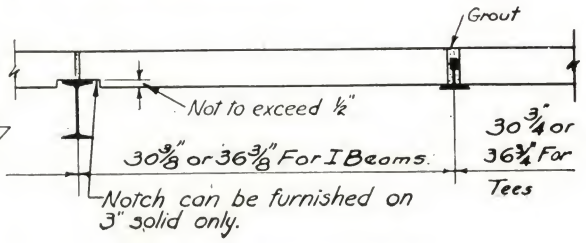
NOTE: ALL TILE REINFORCED WITH ELECTRICALLY WELDED GALVANIZED STEEL MAT

SHORT SPAN ROOF TILE



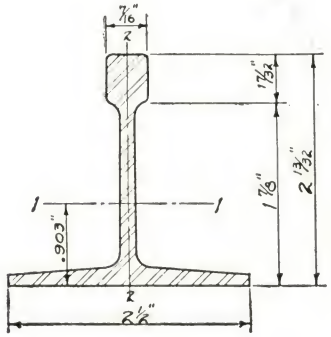
DEPTH	3" SOLID	4" HOLLOW
LENGTH	30" & 36"	30"
WT. PER SQ. FT.	17 lbs.	15.5 lbs.





STANDARD BULB TEE SUB-PURLIN (STEEL)

FOR SHORT SPAN ROOF TILE



WEIGHT PER YARD	9.30 LBS.
AREA OF SECTION	.890 IN²
SECTION MODULUS-AXIS 1-1	.462 IN³
MOMENT OF INERTIA-AXIS 1-1	.695 IN⁴
SECTION MODULUS-AXIS 2-2	.150 IN³
MOMENT OF INERTIA-AXIS 2-2	.188 IN⁴

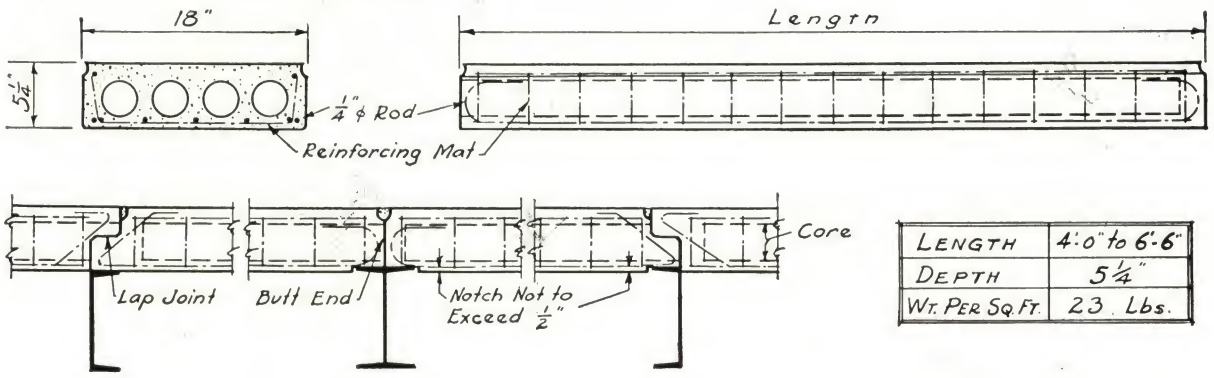
Allowable Spans based on Total Load of 50 lbs. per square foot, spacing of 2'-6¾" - Steel stress of 18,000 lbs. per sq. in. See note below.

MAX. SPAN 7'-4" } WL/10
MAX. DEFLECTION .27" }

MAX. SPAN 6'-8" } WL/8
MAX. DEFLECTION .23" }

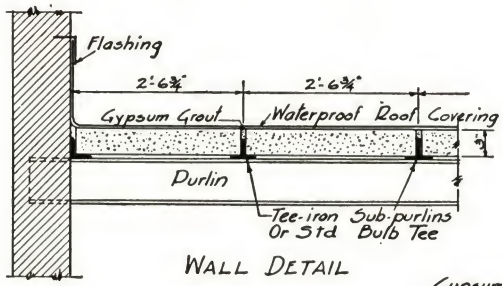
NOTE:-
For spacing other than 2'-6¾", or load other than 50 lbs., the allowable span will vary inversely as the square root of the spacing or the load.

STANDARD LONG SPAN HOLLOW TILE

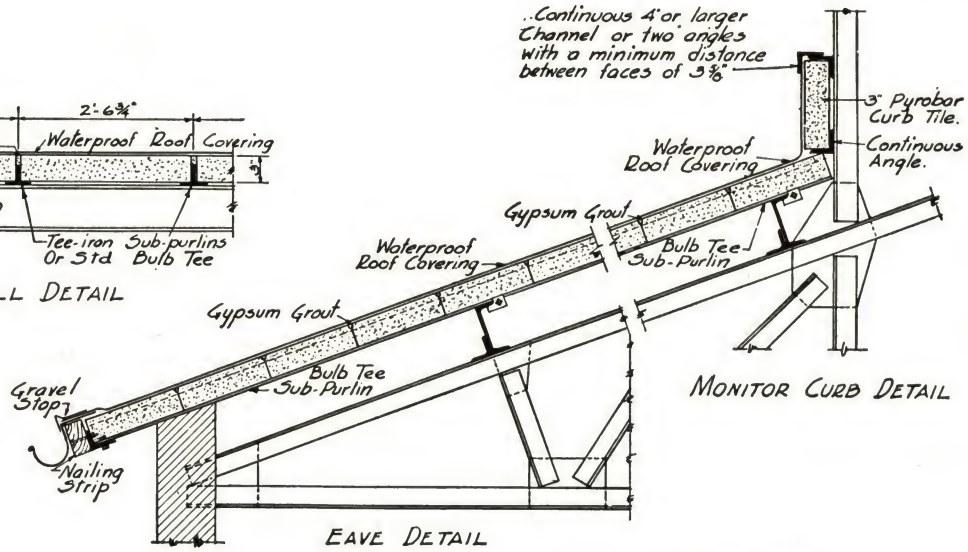


LENGTH	4'-0" to 6'-6"
DEPTH	5¼"
WT. PER SQ. FT.	23 Lbs.

DETAILS OF PYROBAR PRECAST ROOF TILE

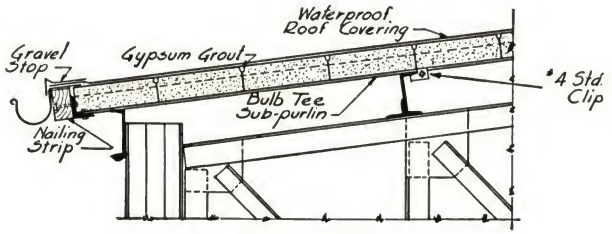


WALL DETAIL

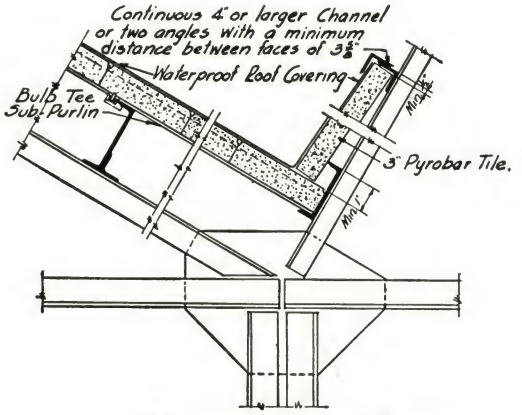


MONITOR CURB DETAIL

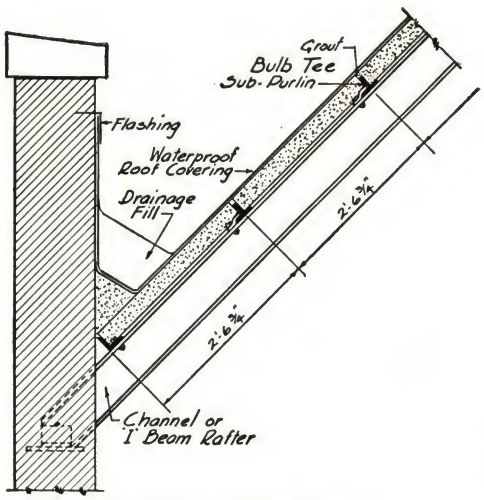
EAVE DETAIL



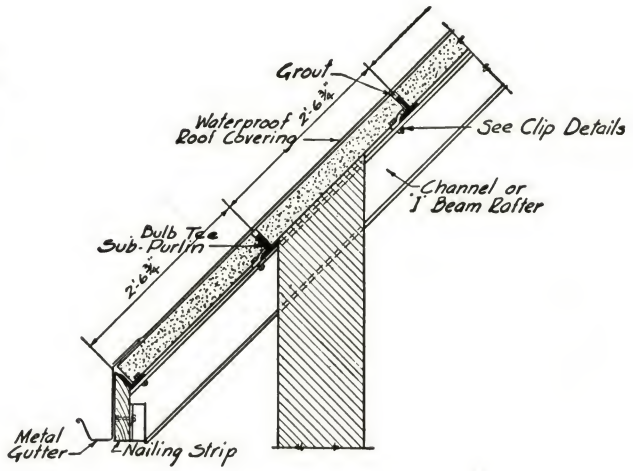
EAVE DETAIL



SAWTOOTH GUTTER DETAIL



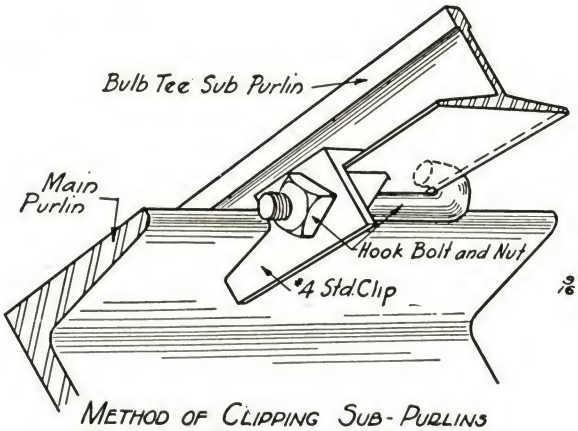
STEEP PITCHED ROOF DETAIL



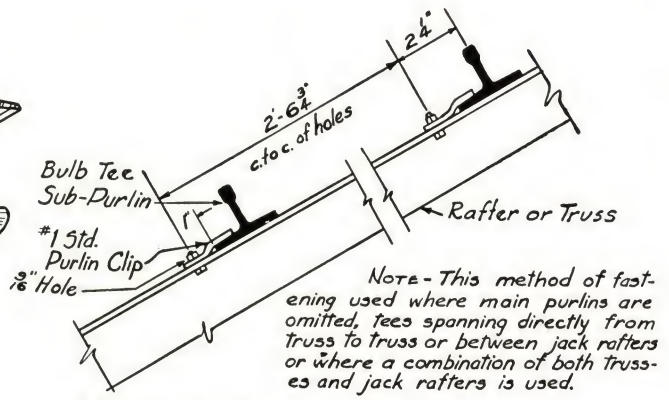
EAVE DETAIL - MANSARD ROOF

Note: 3'-0¾" spacing required for 3"x18"x36" tile

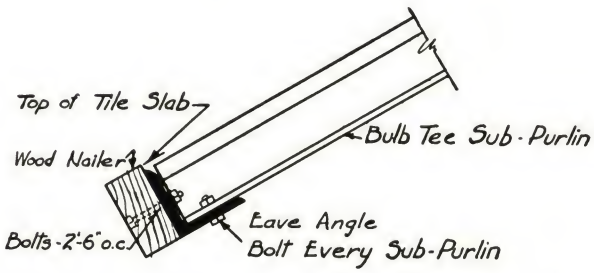
DETAILS OF SHORT SPAN PYROBAR ROOF TILE



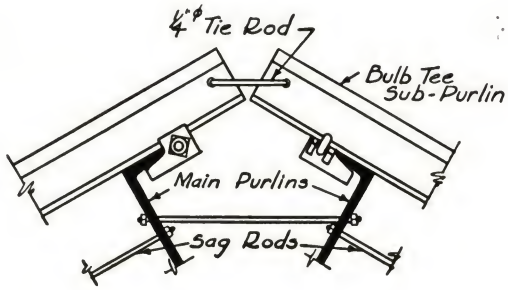
METHOD OF CLIPPING SUB-PURLINS TO MAIN PURLINS - SLOPED ROOF



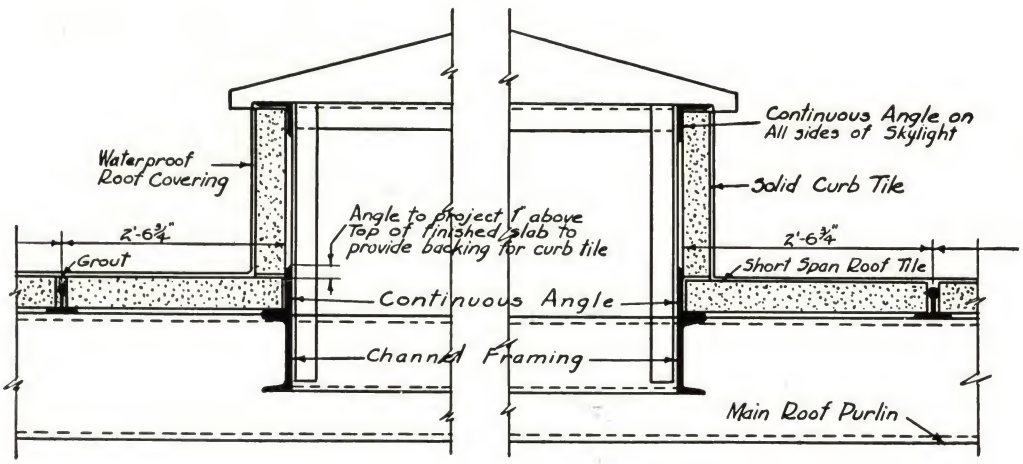
METHOD OF CLIPPING SUB-PURLINS TO TRUSSES OR JACK RAFTERS



METHOD OF BOLTING TEE TO ANGLE AT OVERHANG EAVES



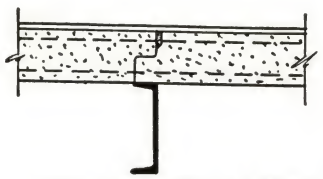
RIDGE DETAIL



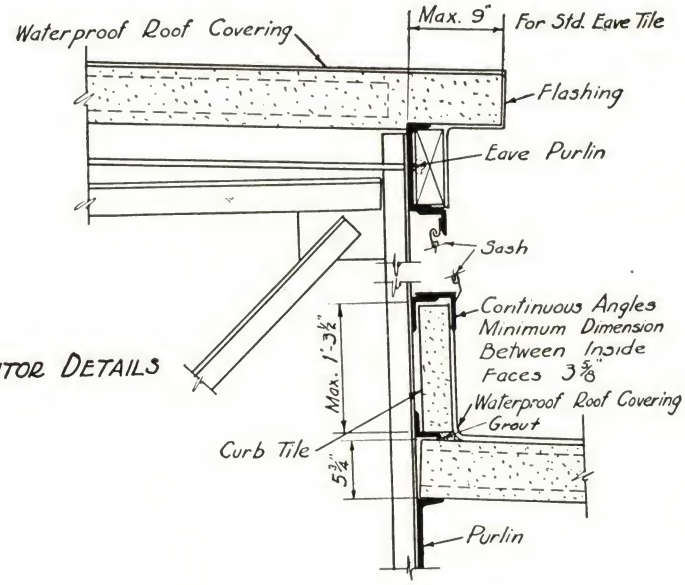
SKYLIGHT DETAIL

Note: 3'-0¾" spacing required for 3"x18"x36" tile

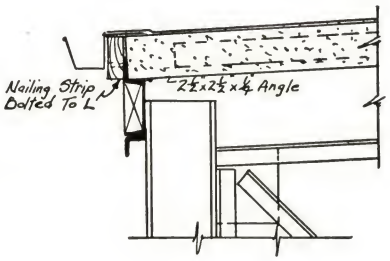
DETAILS OF SHORT SPAN PYROBAR ROOF TILE

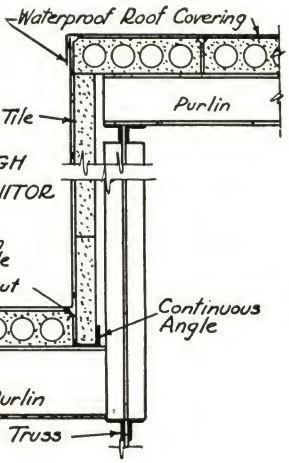


NOTE – Where Channel Purlins Are Used Lap Joint Tile Should Be Used. Notch Tile On Slopes.

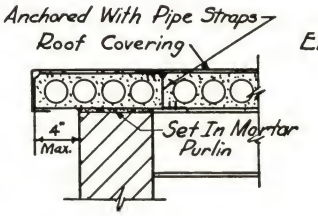


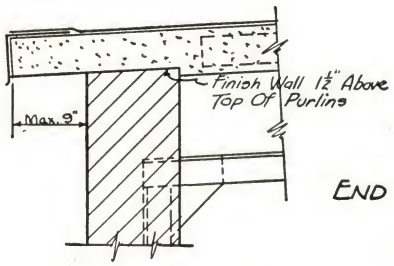
ENLARGED MONITOR DETAILS



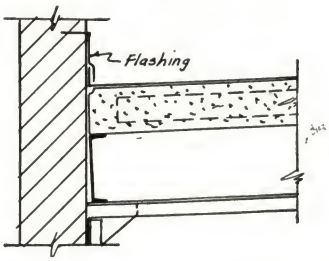


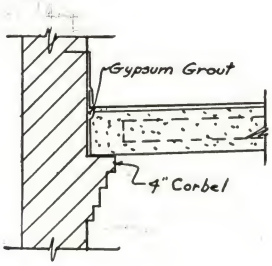
SECTION THROUGH END WALL OF MONITOR

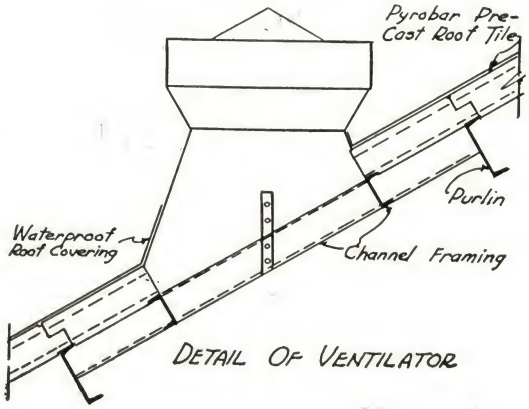




END SECTIONS







DETAIL OF VENTILATOR

DETAILS OF LONG SPAN PYROBAR ROOF TILE

U.S.G. STEEL ROOF DECK

Description

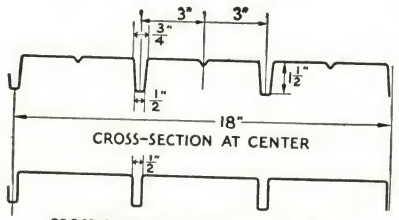
General—U.S.G. Steel Roof Decks (patent applied for) are carefully engineered and backed by twenty years of experience in the roof deck field.

Deck Plates—U.S.G. deck plates are rolled from copper-bearing steel. Mill painted in gray. Other materials on special order. U.S.G. Deck Plates are 18 in. wide with 1½ in. deep reinforcing ribs, 6 in. on centers. Stiffening beads are formed midway between the ribs. Deck plates are interlocking and end-lapping type, clipped together when erected, forming an integral surface for the application of insulation and roofing materials.

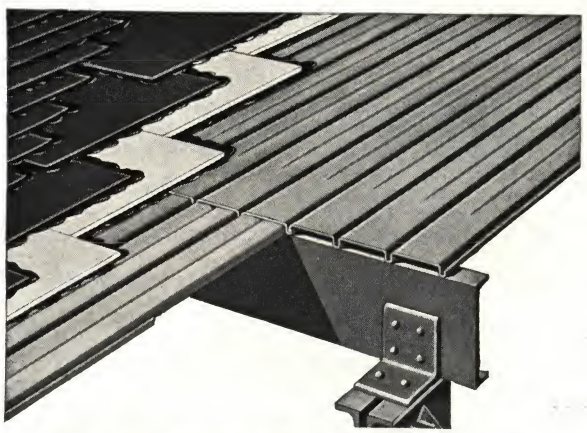
Clips—Two standard types. One for fastening the deck plates to the purlins and the other for locking the plates together between the purlins.

Adaptability

U.S.G. Steel Roof Decks are adaptable for all steel frame structures, fitting any purlin spacing.



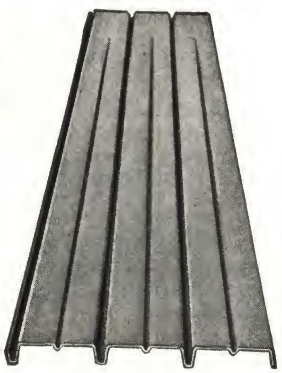
CROSS-SECTION AT OVERLAPPING END



U.S.G. Steel Roof Deck with insulation and roofing

Clip for attaching deck plates to purlins

Intermediate clip for locking plates between purlins



U.S.G. Steel Roof Deck Plate

Advantages

Long Life—This with a minimum of maintenance is assured because of the use of copper-bearing steel and insulation.

Economy—Cost is loweest of any incombustible roof deck.

(1) Structural Steel Savings result from light weight of roof unit.

(2) Fuel Costs are reduced through the use of insulation.

(3) Erection is rapid, due to simplicity of design and method of clipping. Saddles are made from deck plates and are easily placed. These features speed completion of the building and effect economies in construction.

Results—Clean, sanitary and pleasing interior. Year-round comfort for occupants. No condensation to harm material or machinery.

Engineering Data

The allowable safe loads given in the table below are based on actual tests on bare plates. Application of insulation gives additional rigidity to the deck.

Allowable Live Load—Pounds per Sq. Ft.—Factor of Safety 3

Ga	Purlin Spacing								
	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'6"	8'0"	8'6"
20	106	85	70	57	48	41	35		
18				78	66	56	48	42	36

Weight of 20 gauge deck is 2.4 lbs. per sq. ft.; 18 gauge weighs 3.2 lbs. Total dead load, including insulation and roofing material, is approximately 5 lbs. per sq. ft.

Insulation—The accompanying table gives the heat transmission expressed in B.t.u. per hour per sq. ft. per degree difference in temperature. Five-ply roofing is included.

Deck without insulation..... .781 B.t.u.'s
Deck with ½-in. insulation... ..... .358 B.t.u.'s
Deck with 1-in. insulation..... .232 B.t.u.'s
Deck with 1½-in. insulation..... .172 B.t.u.'s

Service—Engineers in the employ of the United States Gypsum Company are experienced in roof design and construction. For practical and economical designs, consult your local sales and service office when the building is being designed.

SPECIFICATIONS

Work Included

Note: Here list the various roof areas to be constructed of U.S.G. Steel Roof Deck.

Materials

General—The steel deck shall be manufactured by the United States Gypsum Company.

Deck plates shall be manufactured from copper-bearing steel and painted light gray after fabrication.

Deck plates shall have reinforcing ribs not more than 6 in. O.C., 1½ in. deep, ½ in. wide at base. Plates shall have stiffening beads formed into the plates midway between the reinforcing ribs.

Deck plates shall be U.S.S. No. 20 gauge for purlin spacings up to and including 7'0" and U.S.S. No. 18 Ga. for purlin spacings over 7'0" up to and including 8'0".

Clips shall be furnished for securely fastening the deck plates to the purlins, and for interlocking adjoining deck plates together at the ends and midway between the purlins.

Erection

Erection shall be done by or under the supervision of the manufacturer.

All end laps shall be not less than 2 in. in length and shall be made directly over the purlins.

Each plate shall be securely fastened to the purlin by steel clips engaging the deck rib.

Each plate shall be securely fastened to the adjoining plate by at least three intermediate clips.

PYROBAR PRECAST CEILING TILE AND FLOOR TILE PYROLITHIC FLOOR CONSTRUCTION

Description

General—These constructions have been designed for use in connection with Junior Beams, Bar Joists and other Metal Joists. They provide a lightweight, economical floor and ceiling construction that is fireproof, affording thorough protection to the steel joists and floor above.

Floor Tile—These are furnished in two general types:

(1) Interlocking Floor Tile for a fixed joist spacing of 30-in. center to center. They are made in precast units of Structolite, 2½ in. thick and 18 in. wide, by 32 in. long (2 in. interlocking bearing) and weigh 14 lbs. per sq. ft. Reinforcement consists of an electrically welded galvanized mat and longitudinal channels.

(2) Tongue and Groove Floor Tile for varied floor joist spacing not to exceed 30 in. They are made in precast units of Structolite, 2½ in. thick and 10 in. wide, in standard lengths of 6 feet, with tongue and groove joints. Reinforcement consists of an electrically welded mat in both top and bottom of the tile so that it can be used with either side up. The tile has a weight of 14 lbs. per sq. ft.

Note: *These floor tile may also be used as roof tile for rafter spacing not to exceed 36 in.*

Pyrolithic Floor Construction—The floor may also be of the Pyrolithic poured in place type similar to our Sheetrock-Pyrofill Roof Construction (see page 3) with the gypsum board supported directly on the floor joists, the thickness of slab and reinforcing being of proper size to carry the load. Full information will be furnished on request.

Ceiling Tile—These are precast units of gypsum of a standard size 2 in. thick and 18 in. wide by 36 in. long, with fractional sizes as required for starting tile, closure tile, etc. They are attached to an intermediate system of hot rolled plasterers channels supported from the floor members.

The ceiling tile have a weight of 10 lbs. per sq. ft. and are reinforced with expanded metal lath throughout. All four sides have lap joints. They are provided with a $\frac{3}{16}$ in. galvanized rod cast near one edge for attaching tile to the channels. The smooth undersurface will save in plastering, as only two coats are required.

Ceiling Tile Constructions are of three types, as shown:

Type A—Tile attached to runners below the joist. Construction requires a minimum of 3½ in. (plus thickness of plaster) below joists.

Type B—Tile attached to runners supported on the joist flange. Construction requires a minimum of 2½ in. (plus thickness of plaster) below joists. Recommended only where space saved is the main consideration, as this type is not as economical as the others.

Type C—Tile suspended the required distance below floor joist. Space for pipes is provided, and if suspended below the girders, no girder fireproofing is necessary.

Pyrobar Ceiling Tile can be used in combination with Pyrobar Shoe and Soffit Tile to provide complete protection for beams and girders.

Adaptability

These constructions are especially adapted to buildings where floor loads are light, such as apartments, hotels, schools, office buildings and theaters in connection with lightweight floor members. The Floor Tile may also be used in roof construction.

Advantages

Fireproof—See page 1. The fireproof qualities of gypsum tile have been successfully demonstrated by numerous tests made at the Underwriters' Laboratories, Inc., and the Bureau of Standards. These tile insulate against the transmission of heat at high temperatures and are of sufficient thickness to afford complete protection to the steel. The expansion and contraction of Pyrobar tile under fire is practically negligible, never being great enough to cause buckling or bulging.

Strength—Pyrobar Floor Tile are designed to develop the full strength of the supporting steel. They will safely carry a uniformly distributed load of 150 lbs. per sq. ft. with a factor of safety of 4, which is more than ample to take care of loads in buildings of the types mentioned above.

Engineering Service

Our engineering service is always accessible to assist in the greatest economy of design.

Hydrocal Mastic Floor Finish

Description—A quick setting Hydrocal Mastic Floor Finish has been developed especially for use over Gypsum Floors, either in precast tile or poured, but it is also recommended for use over concrete, wood, metal or other floors.

It consists of Hydrocal (see page 1) sand and emulsified asphalt, mixed on the job and poured to a thickness of ½ to ¾ in. as required. A durable Mastic surface is provided, highly resistant to dusting, cracking and wear.

Provides a wearing surface or an underlayment for linoleum, carpeting, etc. Gravel is added to the mixture for heavy duty industrial flooring. Samples and further information will be furnished on request.

Note: *Hydrocal Floor Finish is not recommended under extreme acid, oil or moisture conditions.*

Erection—Hydrocal Mastic Floor Finish is furnished in place by the UNITED STATES GYPSUM COMPANY (Contracting Division) including labor and materials.

MASTER SPECIFICATIONS PYROBAR PRECAST CEILING TILE AND FLOOR CONSTRUCTION

Note: *Notes are explanatory or advisory only and should not be included in the specifications.*

(1) Work Included

Note: *Here list the various floor, ceiling and roof areas to be constructed of Pyrobar Floor Tile, Ceiling Tile or Pyrolithic Construction and specify the prescribed live loads. If live loads vary, designate the live loads applying to the various areas. Specify thickness of Pyrolithic Floor Slab.*

(2) Supporting Structural Members

All *(Junior Beams) (Bar Joists) (Metal Joists) (specify)* for the support of Pyrobar Precast Ceiling Tile and Floor Constructions have been designed to carry the prescribed live and dead load.

(3) Materials

(3a) General—All Gypsum products shall be as manufactured by the UNITED STATES GYPSUM COMPANY, 300 West Adams Street, Chicago, Ill.

(3b) Floor Tile—Floor Tile shall be *(Pyrobar Interlocking Floor Tile, 2½ in. thick, 18 in. wide and 32 in. long) (Pyrobar Tongue and Groove Floor Tile)* properly reinforced.

(3c) Ceiling Tile—Ceiling Tile shall be Pyrobar Precast Ceiling Tile, 2 in. thick, 18 in. wide and 36 in. long, properly reinforced.

(3d) Intermediate Ceiling Supports—Intermediate supports shall be 1 in. hot rolled plasterers channel 18 in. on center with necessary clips and hangers for attaching the ceiling tile and for attachment to the floor joists. 1 in. channels shall be *(furred, Type A) (supported on flange of joist, Type B) (suspended, Type C) (specify).*

(3e) Gypsum Board—Permanent forms for the Pyrolithic Floor slab shall be *(Sheetrock) (Gyplap)* in lengths equal to even multiples of the joist spacing, to span not less than two joist spacings.

(3f) Reinforcement—Reinforcement for the Pyrolithic Floor Slab shall be an electrically galvanized mat, with longitudinal wires at 4 in. centers (of proper gauge) and cross wires at 8 in. centers of No. 12 gauge.

(3g) Beam and Girder Fireproofing—Beam and girder fireproofing shall be precast Pyrobar.

(3h) Pyrofill—Pyrofill (Gypsum Fiber Concrete) shall consist of calcined gypsum and sufficient clean water for proper consistency and not to exceed 12½ lbs. of clean soft wood planer shavings to 87½ lbs. of gypsum.

(4) Erection

(4a) By U.S.G. Co.—All Pyrobar Ceiling Tile, Floor Tile and Pyrolithic Floor Slabs including all gypsum *(sleeper fill) (floor fill) (roof drainage fill)* shall be completely erected by the Contracting Division of the UNITED STATES GYPSUM COMPANY.

(4b) Ceiling Tile—All Ceiling Tile shall be accurately placed with close joints substantially hung or anchored to the supporting steel members, using fractional tile wherever required. Use Types A, B or C as detailed.

(4c) Beam and Girder Fireproofing—All portions of beams and girders projecting below the floor joists shall be covered with precast Pyrobar fireproofing set in Gypsum Mortar.

(4d) Floor Tile—All Floor Tile shall be accurately set on the supporting steel members with close joints.

(4e) Pyrolithic Floor—All Floors shall be erected with gypsum board, Pyrofill, reinforcing, as required by the load and joist spacing.

(4f) Sleeper Fill—After the wood sleepers have been fastened in place (by others) pour the *(Pyrofill) (Thermofill)* sleeper fill. Screed the top surface ¼ in. below the tops of sleepers.

Note: *Include the furnishing and setting of sleepers in the Carpentry Work.*

(4g) Roof Drainage Fill—Provide Pyrofill saddles and drainage pitches to direct roof drainage. Where deep fill is required, build of clean dry cinders thoroughly tamped, finished with a surface of Pyrofill.

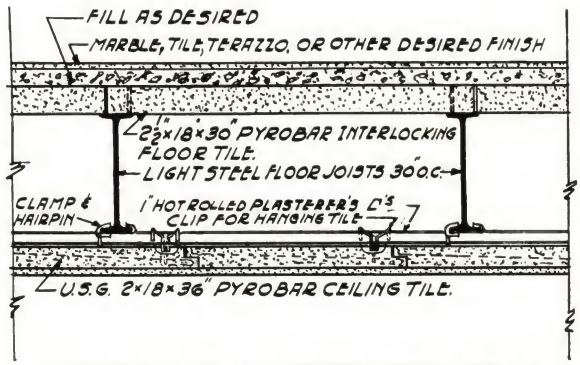
(5) Floor Finishes

Note: *Provide under Carpentry or Cabinet Work for the laying of wood floors attached to sleepers. Provide under other specification divisions for Hydrocal Mastic, marble, terrazzo, tile, cement or other hard floor wearing surfaces or cement or Hydrocal Mastc finished with rubber tile, linoleum or other resilient wearing surface, including fill.*

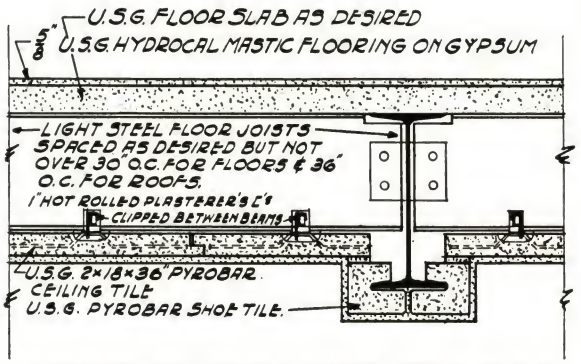
(5a) Hydrocal Mastic Floors—Hydrocal Mastic Floor Finish shall be furnished and erected by the United States Gypsum Company in accordance with their detailed specifications.

(6) Plastering

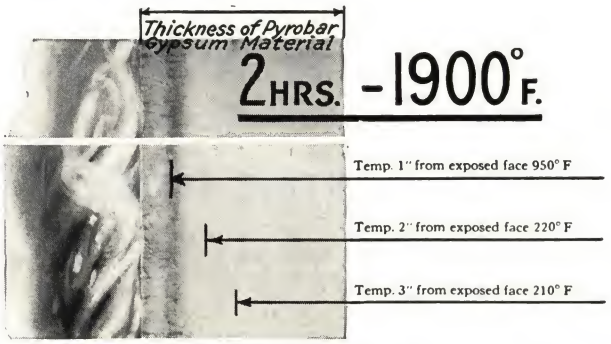
Note: *Specify under the Plastering Specifications that Pyrobar Ceiling Tile require but two coats of plaster. Do not use lime or portland cement plaster.*



FURRED CEILING TILE CONSTRUCTION, TYPE A

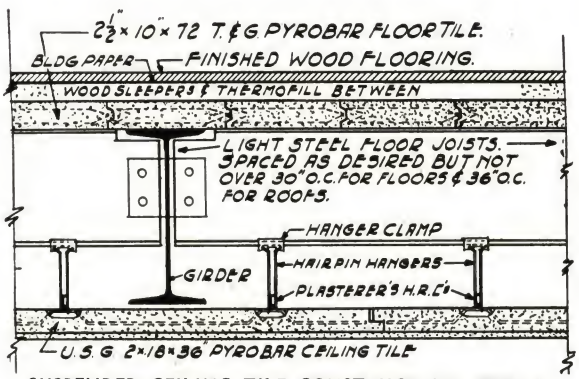


ATTACHED CEILING TILE CONSTRUCTION, TYPE B



Results of Fire Tests Made by Underwriters' Laboratories, Inc., on Gypsum Tile

The tile were subjected to a constant temperature of 1900° F. for two hours. At the end of that time, the temperature of tile, 2 in. away from the flame was but 220° F.



SUSPENDED CEILING TILE CONSTRUCTION, TYPE C

DETAILS—PYROBAR PRECAST CEILING AND FLOOR TILE

PYROFILL MONOLITHIC GYPSUM FLOORS AND ROOFS

Note: For "Gypsum—General Technical Data," see page 1.

Description

The Poured-in-Place System of Gypsum Roof and Floor Slabs has been used in this country for over thirty years, during which time many millions of feet have been installed. The Federal Government early recognized its merits and after thorough tests adopted this system as standard for many types of buildings.

This type of construction consists primarily in the use of steel cables placed in suspension. The live or superimposed loads are transferred to the steel cables by the gypsum slab, the cables carrying the load. Tension in the cables, due to the superimposed load, is transmitted to the end purlin or beam and is taken up by the bracing members. The cables are securely anchored at both ends by means of bent strap iron of sufficient strength to resist the maximum pull of the cables. The cables are put in uniform deflection and tension by ⅝ in. round deflection rods. See page 22.

Advantages

General—Among the chief advantages of this type of construction are: light weight, quick setting and high value of insulation. The slab weighs but 55 lb. per cu. ft. (Less than 40% of the weight of concrete.) This allows lighter supporting steel and a consequent saving in total cost. Initial set is obtained in ten to fifteen minutes and forms can be removed with safety two hours after slab is poured. As Pyrofill generates considerable heat in setting, it is adaptable to winter construction.

For additional floors on existing buildings, no other type of construction is more suitable. Any existing construction which is capable of supporting two extra stories of concrete may, with the same increase in weight, carry three and sometimes four additional floors of Pyrofill construction.

High Insulation—The construction is highly insulative.

The Calculated Values for Various Roof Decks

Note: In the following table, the transmission is expressed in B.t.u.'s per hour, per sq. ft., per degree difference in temperature. All roofs are figured with a 5-ply roof covering.

3-in. Pyrofill—Monolithic Slab	.325 B.t.u.'s
3½-in. Pyrofill—Monolithic Slab	.296 B.t.u.'s
4-in. Pyrofill—Monolithic Slab	.272 B.t.u.'s

Adaptability

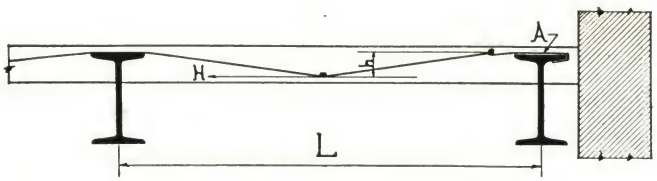
Roofs—Pyrofill Monolithic Roof Decks are adaptable to practically any type of building, either flat, monitor, sawtooth, Pond, Aiken, etc., and will be found to be very economical on jobs of 20,000 ft. or over. On account of the form work needed and the limited number of re-uses, jobs smaller than this will not be found as economical as Sheetrock-Pyrofill Poured System or Precast Tile. The cost of this type of roof will vary with the following conditions: (1) Length of span; (2) Uniformity of span; (3) Pitch of roof; (4) Type of supporting steel—(I-beams or channels); (5) Length of cable run, anchor to anchor.

Usually a span of six to eight feet with a 3-in. or 3½-in. slab will be found to be economical. By preserving uniformity of span, the form work may be used repeatedly without altering; thus effecting an appreciable saving in final cost. While flat roofs require less labor than steep ones, the difference up to 30° pitch is not of sufficient importance to warrant serious consideration on the part of the designer. On a roof pitch of 45° or over, however, it may be necessary to back form from the top.

Floors—The general principles of design and installation of this type of construction are equally applicable to floor construction, except that in strictly fireproof construction, the beams, girders and columns are fireproofed with Pyrofill or Precast Pyrobar Beam Covering. Because of the heavier loads met with in floor design compared with those in roof design we recommend spans not exceeding six or seven feet with slab thickness of 3½ in. or 4 in. for the greatest economy.

Theory of Design

Calculations for this type of construction are based on the well-known suspension bridge formula, in which the cables take the entire load, shear not entering into the calculations. The end bracing is designed to take the dead load pull of the cables until the slab is in place.



In the figure above "H" is the horizontal pull per foot width of slab. "S" is the maximum stress in the cables per foot width of slab and is the resultant of "H" and the weight of the load for the half span. Taking moments about point "A," we have:

$$Hh - \frac{WL}{2} \times \frac{L}{4} = 0 \qquad H = \frac{WL^2}{8h}$$

$$S = \sqrt{H^2 + \frac{(WL)^2}{(2)^2}}$$ which reduces to

$$S = \frac{WL^2}{8h}\sqrt{1 + 16\frac{h^2}{L^2}}$$ which is used in calculating the cable spacing.

MASTER SPECIFICATIONS—PYROFILL MONOLITHIC SYSTEM

Note: Notes are explanatory or advisory only and should not be included in the specifications.

Note: Provide in the steel specifications that the steel contractor shall submit shop drawings to the UNITED STATES GYPSUM COMPANY *for checking and approval.*

(1) General

(1a) All structural steel members shall be furnished in accordance with the UNITED STATES GYPSUM COMPANY'S details for Monolithic Gypsum Floor and Roof Construction designed to carry the prescribed live loads.

(1b) The steel contractor will provide steel framing around all openings larger than 12 in. in diameter and such steel bracing as is required to take the horizontal pull of cables where anchored at end of bays and at all openings.

All channel purlins, at ends of bays and openings, acting as anchorage for the cables, shall open away from the cables to furnish proper support for the clips.

(1c) All openings for (down spouts) (soilpipes) (vents) (specify) etc. shall be accurately located on the forms by others before the slabs are poured.

(2) Work Included

Note: Here list and locate the various floor and roof areas to be constructed of Pyrofill Monolithic Gypsum Floor and Roof Construction and specify the prescribed live loads. If live loads for floors vary, designate the live load applying to the various areas.

(3) Materials

(3a) General—All Gypsum products shall be as manufactured by the UNITED STATES GYPSUM COMPANY, 300 West Adams Street, Chicago, Ill.

(3b) Forms—Forms shall be of tongue and groove dressed lumber of grade to assure level, true slab thicknesses.

(3c) Reinforcing—Reinforcing shall consist of galvanized steel cables made by twisting two No. 12 wires. The cables shall be calculated to take the entire slab load and shall be provided with suitable end fastenings at their ends to develop the full strength required. In no case shall the stress in the cables exceed 20,000 lb. per square inch or more than 20% of the ultimate strength. Furnish ⅝-in. round steel tension rods for center of each slab span.

(3d) Pyrofill—Pyrofill (Gypsum Fiber Concrete) shall consist of calcined gypsum and sufficient clean water for proper consistency and not to exceed 12½ lb. of clean soft wood planer shavings to every 87½ lb. of gypsum. It shall be *(mill) (field)* mixed.

(3e) Curbs, etc.—All *(curb walls) (ends of monitors) (specify)* shall be constructed of *(3-in. Pyrobar Curb Tile, reinforced if restraining drainage fill or carrying roof loads) (poured Gypsum Pyrofill).*

(4) Erection

(4a) By United States Gypsum Co.—All Pyrofill Monolithic Gypsum *(Floor) (and) (Roof)* construction, including all *(curbs) (end walls) (saddles) (drainage fill),* shall be completely erected by the Contracting Division of the UNITED STATES GYPSUM COMPANY.

Note: For Erection Service, see page 1.

(4b) Forms—Forms shall be made in a substantial, workmanlike manner, carefully leveled to insure a uniform depth of slab. They shall be cleaned before each re-use, and shall be wet down immediately before placing the Pyrofill.

(4c) Reinforcing—The spacing of cables and the depth of the slab shall conform to the standards of the UNITED STATES GYPSUM COMPANY. Cables shall be drawn tight and rigidly fastened to anchors and brought to uniform tension. Exercise care in placing tension rods that the cables shall not be brought closer than ½ in. to the undersurface of the slab. After cables are in place all workmen of this and other contractors shall be prohibited from walking thereon.

(4d) Slabs—Pyrofill (Gypsum Fiber Concrete) shall be poured upon the forms completely surrounding the reinforcing cables. The top surface of the slab shall be screeded to as smooth a surface as practical to receive the *(floor) (and) (waterproof roof covering).*

(4e) Curbs—All curbs indicated on plans and details shall be built of *(Pyrobar Curb Tile) (poured Gypsum Pyrofill);* when restraining drainage fill or carrying roof loads curbs shall be reinforced.

(4f) End Walls, etc.—Where indicated on plans and details construct end walls of *(monitors) (sawtooth skylights) ("A" frames) (specify)* of *(Pyrobar Curb Tile) (poured Gypsum Pyrofill).*

(4g) Drainage Fill, etc.—Provide Pyrofill saddles and drainage pitches to direct roof drainage to *(gutters) (drainage outlets).*

(5) Waterproof Roof Covering

Note: Provide in the Roofing and Sheet Metal division of the specifications that the waterproof roof covering shall be applied as soon as possible after the gypsum roof slab is erected (preferably within twenty days). Do not plaster or paint underside of roof slabs until waterproof roof covering has been applied and the slab is thoroughly dry.

Note: Include in Roofing and other specification divisions where applicable that plank runways shall be laid on the slab before any wheeling is done. Planks shall be laid from purlin to purlin to take any heavy or concentrated loads which may be applied to the slab.

CABLE SPACING AND SLAB DEPTHS FOR VARIOUS LOADS AND SPACES

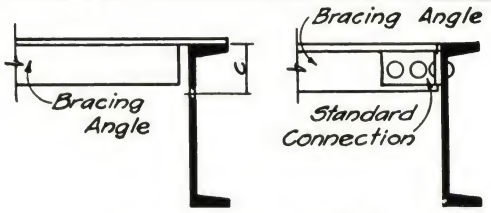
Cable stressed to 20,000 lb. per sq. in. See page 20 for formulas used in calculations

Depth of slab, in.	Wt. of slab per sq. ft., lb.	Cable spacing, in.	PYROFILL MONOLITHIC FLOOR AND ROOF CONSTRUCTION SAFE SUPERIMPOSED LOADS IN POUNDS PER SQUARE FOOT OF SLAB												
			3′-6″	4′-0″	4′-6″	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	8′-6″	9′-0″	9′-6″	10′-0″
3	12	1	...	...	...	...	172	142	120	102	...	...	...	...	...	...
		1¼	...	...	...	166	134	111	94	79	...	...	...	...	...	...
		1½	...	...	170	136	111	91	76	63	...	...	...	...	...	...
		1¾	...	...	144	115	93	76	63	53	...	...	...	...	...	...
		2	...	161	125	99	80	65	54	45	...	...	...	...	...	...
		2¼	...	142	110	87	70	56	47	39	...	...	...	...	...	...
		2½	168	126	97	77	62	50	41	34	...	...	...	...	...	...
		2¾	151	114	88	69	55	44	36	29	...	...	...	...	...	...
		3	138	103	79	62	49	39	32	...	...	...	...	...	...	...
3½	14	1	...	...	...	...	...	...	150	128	110	95	...	...	...	...
		1¼	...	...	...	...	169	141	118	100	85	73	...	...	...	...
		1½	...	...	...	170	139	114	96	81	69	59	...	...	...	...
		1¾	...	...	...	144	117	96	80	67	57	48	...	...	...	...
		2	...	...	156	124	100	82	68	57	48	40	...	...	...	...
		2¼	...	...	137	109	88	72	59	49	41	34	...	...	...	...
		2½	...	160	122	97	78	63	52	43	36	30	...	...	...	...
		2¾	...	142	109	87	69	56	46	38	31	26	...	...	...	...
		3	171	129	99	78	62	50	41	33	27	...	...	...	...	...
4	16	1	...	...	...	...	...	...	...	154	133	114	100	87	77	68
		1¼	...	...	...	...	...	168	141	120	102	88	76	66	58	51
		1½	...	...	...	...	166	138	115	97	81	71	61	53	46	40
		1¾	...	...	...	172	140	116	96	81	69	59	50	43	37	32
		2	...	...	...	149	121	99	82	69	58	49	42	36	30	26
		2¼	...	...	164	130	105	86	71	59	49	42	35	30	25	...
		2½	...	...	146	116	93	76	63	52	42	36	30	25	...	...
		2¾	...	169	131	103	83	68	56	46	37	31	...	...	...	...
		3	...	154	118	94	75	61	50	41	33	27	...	...	...	...
4½	18	1	...	...	...	...	...	...	...	...	151	134	117	102	90	79
		1¼	...	...	...	...	...	...	...	140	117	103	90	78	68	60
		1½	...	...	...	...	...	160	134	114	94	83	72	62	54	47
		1¾	...	...	...	...	163	135	112	95	78	69	59	51	44	38
		2	...	...	...	...	140	115	96	81	66	58	49	42	36	31
		2¼	...	...	...	152	123	101	83	70	57	49	42	35	30	25
		2½	...	...	...	135	109	89	73	61	49	43	36	30	25	...
		2¾	...	...	152	121	97	79	65	54	43	37	31	26	...	...
		3	...	...	138	109	88	71	58	48	38	33	27	22	...	...
5	20	1	...	...	...	...	...	...	...	...	...	153	133	117	103	91
		1¼	...	...	...	...	...	...	...	160	137	118	103	89	78	69
		1½	...	...	...	...	...	...	153	130	111	95	82	71	62	54
		1¾	...	...	...	...	...	154	128	108	92	79	68	58	50	43
		2	...	...	...	...	160	132	110	92	78	66	57	48	42	36
		2¼	...	...	...	...	140	115	95	80	67	57	48	41	35	29
		2½	...	...	...	153	124	102	84	70	58	49	41	36	29	24
		2¾	...	...	...	137	111	90	74	62	51	42	36	30	25	20
		3	...	...	153	124	100	81	67	55	45	38	31	26	21	...

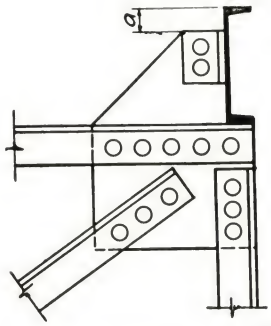
On page 21 will be found a table giving the safe superimposed loads for different depths of slabs, cable spacing and various spans of beams and purlins. These values have been given for the convenience of the designer. Below will be found the size of bracing members for end purlins. In designing a poured gypsum floor or roof, the end purlin must be so designed that it will withstand a lateral pull as well as the direct load, without excessive deflection and without exceeding the allowable stresses.

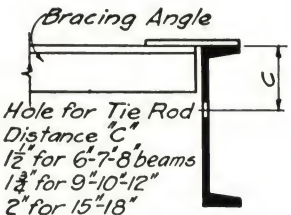
For ordinary roof loadings, the end member which usually consists of a channel will be found to have sufficient strength to take this lateral pull when braced as shown below. When heavier loadings are involved an I-beam or built-up member of this ⌋⌈ or this ⌋⌐ type will be found very efficient for stiffening action for short span purlins without the use of bracing angles and tie rods. The tops of the bracing angles must frame flush with tops of beams. Holes for tie rods should be placed so that the tie rod will come in the center of the slab or be thoroughly embedded after the slab is poured.

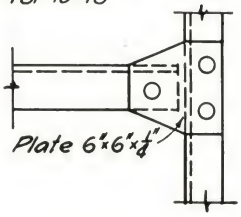
BRACING		
SPAN	ANGLE	ROD
7'-0" OR LESS	2" x 2½" x ¼"	5/8" ϕ
7'-0" TO 8'-0"	2½" x 2½" x ¼"	5/8" ϕ
8'-0" TO 9'-0"	3" x 2½" x ¼"	¾" ϕ
9'-0" TO 10'-0"	3" x 3" x ¼"	¾" ϕ



CONNECTION AT "B"

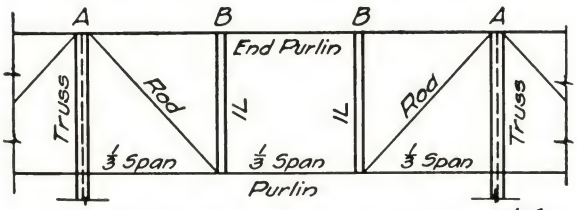




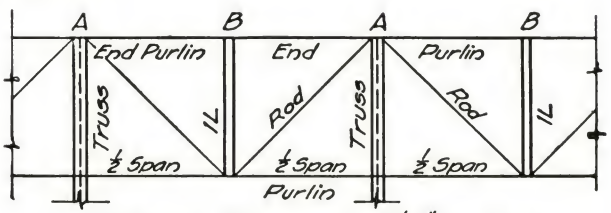


CONNECTION AT "A"

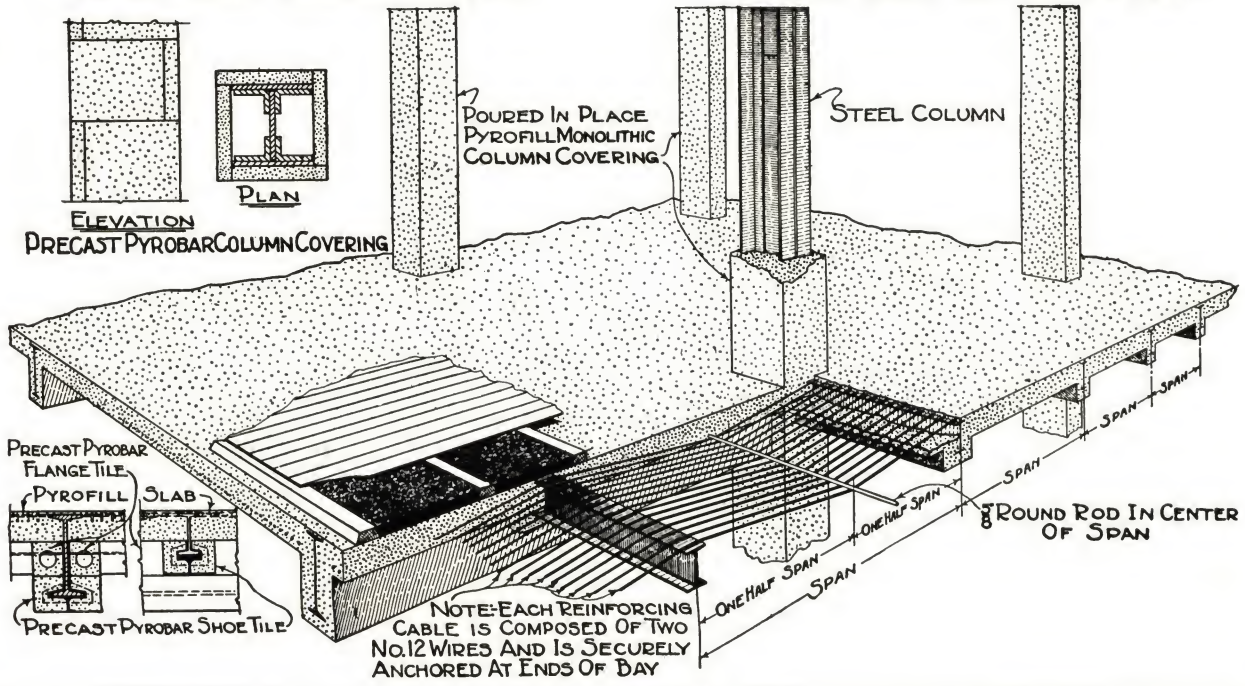
Dimension "a" to be 1½" for 15"[s and 1" for all smaller [s. When I beams are used make "a" as small as possible.



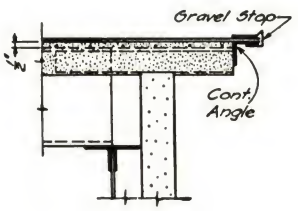
PURLIN SPAN GREATER THAN 16'-0"

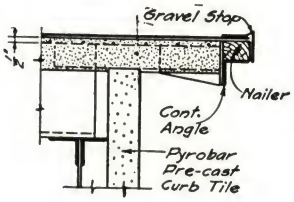


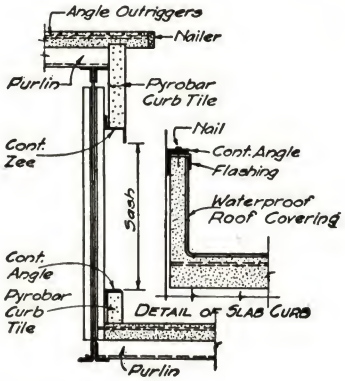
PURLIN SPAN OF 16'-0" OR LESS.

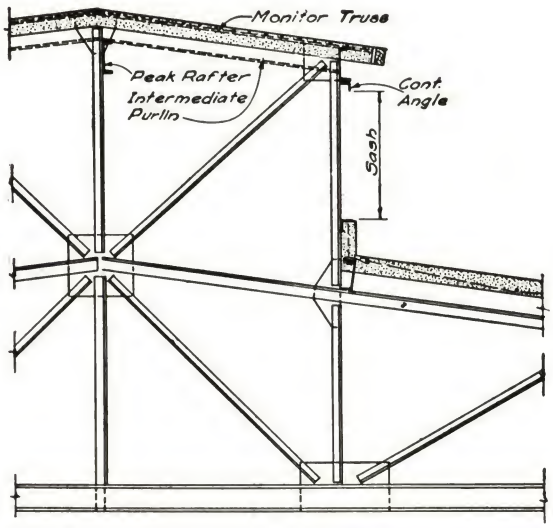


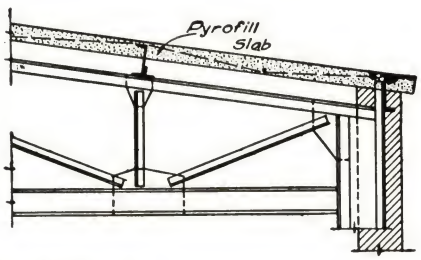
DESIGNING DATA—PYROFILL MONOLITHIC SYSTEM



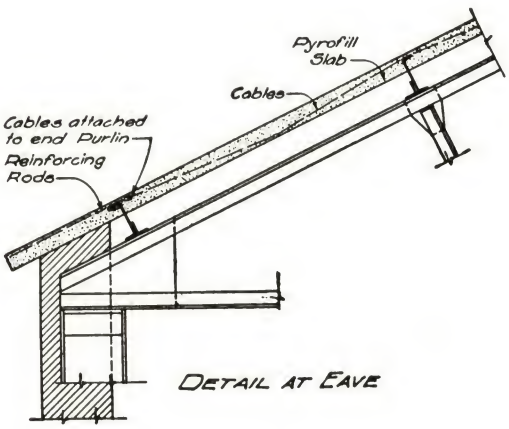




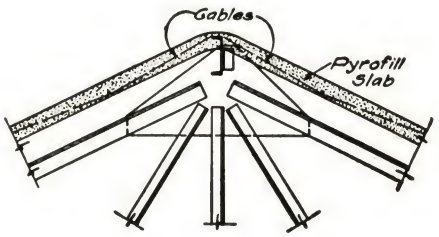




TYPICAL MONITOR CONSTRUCTION



DETAIL AT EAVE



DETAIL AT RIDGE

DETAILS—PYROFILL MONOLITHIC CONSTRUCTION

PYROBAR PARTITION AND FURRING TILE
PYROBAR COLUMN, BEAM AND GIRDER FIREPROOFING

Description

Note: For "Gypsum—General Technical Data," see page 1.

Pyrobar Gypsum Tile consist of 97% gypsum and 3% special wood fiber. They are moulded in steel moulds by continuous automatic machine process, which insures accurate proportions and an even distribution of gypsum, fiber and water, resulting in tile of uniform size, weight, strength and density.

Physical Characteristics

Fireproof—See particularly page 1. The claims for Pyrobar Tile as a fireproof building material are based upon many tests which have been conducted by recognized authorities over a period of twenty-five years.

A complete list of authoritative tests will be furnished on request.

Outstanding among the many tests made to obtain favorable rating and to pass the requirements of various district rating bureaus is that conducted at the Underwriters' Laboratories on June 22, 1910. This test was made on a 3-in. hollow Pyrobar partition, plastered on both sides with Gypsum plaster to ½-in. grounds. The partition was subjected to a fire on one side for a period of two hours and the temperature reached 1900° F. in the first 30 minutes and remained at that point for the next 90 consecutive minutes. At the end of two hours a ⅞-in stream of water was applied to the heated side of the panel at a pressure of 50 lb. per sq. in. at a distance of 20 ft. for a five minute period, the object being to determine the structural strength of the Pyrobar wall after such a fire test. The average temperature on the unexposed surface was 166° F., an increase of only 90° above the room temperature of 76° F. Based on the results of these tests, the Underwriters' Laboratories, Inc., has given a two hour fire rating to the above partitions.

The four definite points established in favor of Pyrobar Tile by this test are:

(1) Fireproof and Incombustible
(2) Retention of Structural Strength
(3) Insulation against Heat Transmission
(4) Shatter-proof under water test.

It is significant to note that gypsum tile is the only partition tile used for fireproof construction that has passed the test requirements of the Underwriters' Laboratories, Inc.

Does Not Expand or Contract—Precast Gypsum does not expand or contract under ordinary conditions. Even under the average fire temperatures a 10 ft. Pyrobar wall will only expand ⅛ in. Other incombustible materials, almost without exception, expand rapidly under high temperatures and, held rigidly between floors, cannot expand except outwardly, and therefore they bulge, crack, spall and finally wreck themselves.

Light Weight—Pyrobar Precast Gypsum Tile Partitions are from 25% to 50% lighter per square foot than ordinary building tile of equal thickness. The use of Pyrobar Tile materially reduces the dead load, effecting worth while savings in steel in columns, girders, beams or other supporting members. Light weight likewise means a saving in freight, hauling, hoisting and labor costs. See Table of Weights, pages 25 and 27.

Non-conductor of Sound—Unless a partition is properly constructed with the purpose of excluding sound, the benefits derived by the use of a soundproof partition are lost. Authentic tests show that less than 1/100 of one per cent of incident sound is transmitted through a gypsum tile partition plastered with gypsum plaster.

When pipes occur in partitions or when doors and transoms are present, the sound resistive value of the construction is materially reduced. Continuous floor finish under a partition, particularly if of cement, marble or tile, or suspended ceilings running over partitions, all tend to carry sound from one room to another.

Gypsum tile partitions are excellent non-conductors of sound and as such are recommended and successfully used in hospitals, schools, office buildings, apartments, hotels and all buildings where a soundproof partition is of particular importance.

Heat Insulating Value—Walter A. Hull, formerly Associate Physicist at the Bureau of Standards, conducted a series of tests, the results of which are published in Technologic Paper of the Bureau of Standards No. 130 entitled, "A Comparison of the Heat Insulating Properties of Some of the Materials Used in Fire Resistive Construction." In this paper Mr. Hull states:

"These tables show that the length of time required for a temperature of 600° C. (1112° F.) to be attained at a depth of one and one-half inches does not vary greatly in the clay and concrete specimens. The gypsums are seen to be distinctly better than the clay and concrete in this respect, only one of them reaching the temperature of 600° C. (1112° F.) at a depth of one and one-half inches in the three and one-half hour test."

It is of considerable interest to note that of twenty-eight gypsum specimens tested, only one of them reached the temperature of 600° C. at a depth of one and one-half inches in the three and one-half hour test. Mr. Hull comments on this as follows:

"Obviously the gypsum specimens and the one of radix having failed to reach 600° C. (1112° F.) at a depth of one and one-half inches, were far from reaching it at a depth of two and one-half inches and indicate distinctly superior thermal protection for embedded steel."

A Perfect Stainless Plaster Base—Since Pyrobar is composed of gypsum and is laid up with gypsum mortar, gypsum plaster unites perfectly with it. Pyrobar constructions are particularly rigid, due to the strength of the tile itself and the large units which reduce the mortar joints to minimum. Containing nothing but gypsum and a small per cent of special UNITED STATES GYPSUM COMPANY fiber, there is no acid or alkali in Pyrobar to stain the plaster or wall decorations.

Plaster Savings—Pyrobar tile are cast in steel moulds assuring a product with straight edges and true faces. They are dried in kilns, not burned—there are no warped or distorted surfaces. When set in the wall, Pyrobar presents a surface requiring less plaster than other fireproof wall construction. Furthermore, due to the fact that there are 40% less joints in a Pyrobar wall than, for example, in a clay tile wall, there is a considerable saving in setting mortar.

Economical—Breakage is almost negligible and the small pieces of waste from cutting and fitting can be utilized. Definite other economies affecting steel and handling are established in "Light Weight" above; plaster in the preceding paragraph, and labor in "Quickly Erected" under heading "Advantages" on the next page.

Low maintenance is assured due to permanence, fireproofness and stainlessness.

Erection Service

Where desired, Pyrobar Tile are completely erected by the U.S.G. Contracting Division. See page 1.

Approved Uses

In the following classes of fireproof construction, Pyrobar Precast Gypsum Tile are approved by the Underwriters' Laboratories, Inc., and most city building codes.

Non-bearing corridor walls, partitions, wall furring and false columns and pilasters. Partitions and corridors in merchandise storage warehouses.

Fire division walls.

Elevator, stairway, dumbwaiter and corridor enclosures.

Light wells, pipe chases, heat and vent ducts.

As covering for columns, beams, girders, trusses and other steel members requiring fireproofing.

Floor fill, instead of cinder concrete fill.

Insulation on concrete roofs.

PYROBAR PARTITION AND FURRING TILE—COLUMN COVERING

Description

Partition and Furring Tile—A Pyrobar tile is 30 in. long, 12 in. high and of various thicknesses from 1½ to 6 in. For complete sizes and weights, see table below.

Smooth face tile are made for warehouse and similar use where the furring and partitions are to remain unplastered.

Pyrobar tile meets fully the standard specifications for Gypsum Partition tile or block of the American Society for Testing Materials.

For the protection of owners, architects, engineers and contractors, all Pyrobar Gypsum Tile bear the trade-mark.

Column Covering—Column fireproofing is accomplished either with 2 in. solid or 3 in. hollow Pyrobar Partition Tile. When desired, or required by a building code, the space between the covering and the steel may be solidly backfilled with pieces of Pyrobar Tile and gypsum mortar. A digest of reports giving tests on gypsum fireproofing is available on request.

Advantages

Alterations Easily Accomplished—Openings in Pyrobar Tile walls may be accurately cut with a saw. Thus alterations are speedily and cheaply made by one mechanic. Trim, fitted over the edges of the tile effectively hides the alteration, saving replastering and redecorating. In most cases the tile removed can be salvaged for other work.

Quickly Erected—Each unit of Pyrobar installed is two and one-half sq. ft. These light 12x30-in. units are handled readily and erected quickly. The average mechanic will lay up more Pyrobar than clay tile in a day and do a neater and more workmanlike job because of the accurately true size and shape of the unit. Pyrobar is easily and quickly sawed to fit around difficult pipe chases, etc., which ordinarily slow up the work. Even curved work is easily accomplished.

Grounds Easily Provided For—Grounds for the attachment of fixtures and wood trim are securely attached to easily installed staggered nailing plugs or nailing blocks. See details, page 29.

Recommended Thickness—Partition and Furring Tile

Pyrobar Gypsum Tile for furring and partitions are made in standard face dimensions (12x30 in.) in both solid and hollow types, and various thicknesses to meet Underwriters' standards and the building codes of the various cities. For table of sizes and weights, see below.

The thickness of the partition should be determined primarily by the ceiling height and by its location. As a rule 3 or 4-in. tile is the thickness used for the average building where partitions do not exceed 15 ft. in height. Corridor partitions are generally thicker than transverse partitions.

Two-inch solid Pyrobar Tile are used for partitions not exceeding 10 ft. in height and for covering columns, constructing pipe chases, vent ducts, dumbwaiter shafts, etc.

Split and hollow Pyrobar Furring are laid up against exterior walls and securely spiked every square yard. Joints should be broken the same as for partition work. Furring may also be fastened to the building wall by means of wall ties built into the masonry. The hollow portion of the tile should be placed against the walls, thus minimizing the contact area with the outside walls.

Where furring stands free from the wall, allowing space for pipes, vents, etc., it is customary to use 2-in. solid or 3 or 4-in. hollow Pyrobar Tile to assure necessary rigidity.

Free standing furring should be anchored to the exterior wall either by dwarf walls between the furring and exterior wall, or by building into the exterior wall corrugated metal wall ties of sufficient length to span the space and be embedded in the furring tile joints.

Set Fast Cement

This is a specially prepared gypsum cement used with water and sand as a mortar for setting gypsum partition tile, and gypsum fireproofing and column covering. It is also extensively used as a mortar for interior clay tile partitions and fireproofing. Its easy working qualities together with the early setting of the gypsum makes Set Fast Cement Mortar ideal for economical, rigid mortar joints in all interior tile work.

SIZES AND WEIGHTS OF PYROBAR PARTITION AND FURRING TILE

Size of Pyrobar, Gypsum Tile, In.	For ceiling heights up to	Weight tile per sq. ft., lb.	Weight mortar per sq. ft., lb.	Weight plaster, one side, per sq. ft., lb. ½ in. grounds	Total weight plastered, one side, per sq. ft., lb.	Weight plaster two sides per sq. ft., lb.	Total weight plastered, two sides, per sq. ft., lb.
1½-in. Split—1½x12x30	Furring†	4.9	1.4	3	7.9		
2-in. Split—2x12x30	Furring†	6.4	1.4	3	9.4		
2-in. Solid—2x12x30	10 feet*	9.4	1.5	3	12.4	6	15.4
3-in. Hollow—3x12x30	13 feet*	9.9	2.0	3	12.9	6	15.9
3-in. Solid—3x12x30	15 feet†	13.0	2.0	3	16.0	6	19.0
4-in. Hollow—4x12x30	17 feet*	13.0	2.5	3	16.0	6	19.0
5-in. Hollow—5x12x30	20 feet*	15.6	2.75	3	18.6	6	21.6
6-in. Hollow—6x12x30	30 feet*	16.6	3.0	3	19.6	6	22.6

*Underwriters' Laboratories recommendations. †No Underwriters' recommendation.

PRELIMINARY SPECIFICATION REQUIREMENTS

(Applying to Pyrobar Partitions, Furring and Column Covering)

Note: *The following should be included under other specification divisions where and when they apply.*

Note: *Notes are explanatory or advisory only and should not be included in the specifications.*

(1) Masonry Work

Note: *As stated under "Recommended Thickness," above, there are two methods of securing furring and the ends of partitions to the building masonry walls: (1) with 10d cut nails driven into the joints of the masonry, (2) with corrugated metal wall ties of the proper length to be built into the masonry, spanning furring space if any and to be embedded in the Pyrobar Tile joints. If method (2) is used, include the following clause:*

(1a) Provide and build into masonry walls corrugated galvanized sheet iron ties to anchor the *(ends of Pyrobar partitions) (and) (Pyrobar Wall Furring)* to the masonry work.

(1b) Ties for partition ends shall be accurately set and spaced 12 in. apart on centers to build into the Pyrobar Tile joints.

(1c) Ties for furring, one for each surface, sq. yd., shall be accurately set to build into the Pyrobar Tile joints.

(2) Miscellaneous Steel Work

Note: See details, page 29.

(2a) All openings in Pyrobar partitions so noted on plans or schedules shall be provided with (channel bucks) (channels reinforcing wood bucks).

(2b) The lintel bucks of all openings in Pyrobar partitions over 6 ft. wide shall be reinforced with steel lintels as *(noted on plans or schedules) (as detailed).*

(3) Reinforcing Bars

All openings in Pyrobar partitions over 4 ft. wide but not over 6 ft. wide shall be provided with ½ in. steel reinforcing bars, 3 to the opening. Bars shall be 8 in. longer than the actual width of tile opening (not buck width).

(4) Carpentry Work

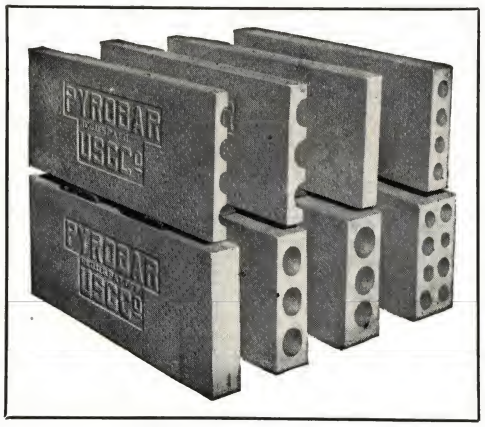
Note: See details, page 29.

(4a) Bucks—Provide wood bucks for all openings in Pyrobar partitions (except where steel bucks are indicated) (reinforced with steel channels where so indicated). Bucks shall be made of 2-in. lumber the depth of the Pyrobar Tile thickness, to the edges of which shall be secured ½x2¾ in. plaster grounds forming a rabbet to receive the tile. Bucks shall be accurately set, plumb and true and rigidly braced, so as to cause no delay or interruption in the erection of the partitions.

(4b) Nailing Blocks—Provide and nail directly to the end of Pyrobar *(partition) (and) (furring)* tile nailing blocks spaced 30 in. on centers to take all wood grounds to receive trim. Blocks shall be ⅞ in. thick and of such dimensions as will completely cover the end of the tile.

Where required to secure heavy fixtures, trim, etc., provide similar 1½-in. thick nailing blocks spaced not to exceed 15 in. on centers.

(4c) Grounds—Provide ½-in. plaster grounds to receive all trim.



(5) Miscellaneous

Note: Heavy fixtures, etc. are best secured to Pyrobar partitions with steel plates and through bolts as described on page 29. Provide where required.

(6) Plastering

Note: For Plastering on Pyrobar, see Sweet's Manufacturer's Index for U.S.G. "Master Specifications — Interior Lathing and Plastering." Under no circumstances should portland cement or lime plaster be used for the first coat—use only gypsum plaster.

MASTER SPECIFICATIONS
PYROBAR PARTITION, FURRING AND COLUMN COVERING

Note: Notes are explanatory or advisory only and should not be included in the specifications.

(1) Work Included

All partitions *(and) (all furring for exterior masonry walls) (and) (all column covering)* shall be built of Precast Pyrobar Gypsum Tile.

Note: If there are any exceptions, so note. List and locate any special requirements not clearly indicated on plans and details. Particularly list and locate where smooth face tile are to be installed requiring no plaster finish.

(2) Preliminary Provisions

(2a) All reinforcing bars for reinforced lintels will be furnished by others.

(2b) All rough bucks for openings will be provided and accurately set by others.

(2c) All wood nailing blocks to receive grounds, etc., will be provided and attached to tile by others.

(3) Materials

(3a) General—All gypsum tile and cement shall be as manufactured by the UNITED STATES GYPSUM COMPANY.

(3b) Partition Tile—Pyrobar of thicknesses indicated on plans. *(Pipe chases) (small shafts) (heat) (and) (vent) (ducts)* etc. shall be constructed preferably with 3-in. Hollow Pyrobar, otherwise of 2-in. solid Pyrobar.

Note: See "Recommended thickness," page 25.

Where no plastering is required, tile shall be smooth face.

(3c) Furring Tile—Pyrobar *(split) (solid) (specify thickness).*

Note: See "Recommended thickness," page 25.

Where no plastering is required, tile shall be smooth face.

(3d) Column Covering—Pyrobar (2-in. solid) (3-in. hollow).

(3e) Mortar—Sand for mortar shall be clean and sharp and free from organic matter with grains graded from fine to coarse.

Cement for mortar shall be Setfast Gypsum Cement.

Note: Do not use portland cement or lime.

Mortar shall be mixed in a clean mortar box in the proportions of one part of cement to three parts of sand, by weight, and sufficient clean water to bring to the right consistency. First place a layer of sand in the high end of the mortar box, over which spread a layer of cement. Hoe dry from one end of the box to the other and back again, working sand and cement thoroughly together to a uniform color. Put water in low end of box and hoe mortar into water mixing thoroughly. Do not mix more material than can be applied in approximately one hour. Do not retemper.

(4) Erection

(4a) By U.S.G. Co.—All Pyrobar *(partitions) (and) (furring) (and) (column-covering)* shall be completely erected by the UNITED STATES GYPSUM COMPANY'S Contracting Division.

Note: See "Erection Service," page 25.

(4b) General—All tile shall be laid in gypsum mortar with full, flush joints to a line, with horizontal beds uniformly level on each course. All joints, chinks and crevices between the tile and other work shall be filled with mortar well slushed in. Joints in alternate courses shall be broken.

All joints of smooth tile (unplastered) shall be neatly pointed smooth as the work progresses. Fill all exposed core openings at corners, etc.

All tile shall be started on the fireproof floor, set plumb straight and true, and wedged at ceiling and slushed with mortar. Tile at corners and re-entrant angles shall be laid interlocked in alternate courses.

(4c) Partitions—All partitions coming in contact with existing walls shall be rigidly anchored, *(by driving 10d spikes driven into the mortar joints of the wall at the joints of each partition tile course) (by building in at each partition tile course metal ties provided and built into the masonry by others.)*

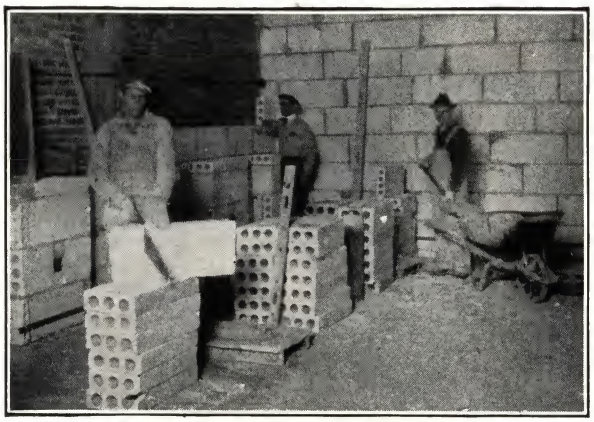
Note: *Select clause which applies. See under "Masonry Work," on page 25.*

(4d) Furring—Furring shall be laid *(against) (or) (free from)* the walls as shown on the plans and details.

Rigidly anchor the furring tile to the masonry wall every square yard of face area *(by 10d spikes driven into the mortar joints of the wall at the course joints of the furring tile) (by building in at the furring tile course metal ties provided and built into the masonry by others).*

Note: *Select clause which applies. See under "Masonry Work," on page 25.*

(4e) Column Covering—A single thickness of tile shall be laid against the outside edges of the steel (and the space between the tile and steel shall be solidly backfilled with pieces of Pyrobar tile and gypsum mortar).



Erecting Pyrobar Partitions and Furring
Note ease of sawing and handling

Note: *Include or omit clause covering backfilling as required. See last paragraph under "Description," page 25.*

(4f) Buck Anchors—Anchor all wood bucks to tile by 10d cut nails driven into the buck at each tile course or other approved metal anchor.

(4g) Lintels—Lintels shall have at least 4-in. bearing at each end on the tile beneath. Openings not over 22 in. wide shall be spanned by a single tile. Lintels over openings more than 22 in. and not over 4 ft. wide shall be laid in the form of a jack-arch. Lintels over openings more than 4 ft. and not over 6 ft. wide shall be reinforced with steel rods set in the tile voids flushed full with mortar. Lintels over openings more than 6 ft. wide shall be provided with steel lintel furnished by others.

PYROBAR BEAM AND GIRDER FIREPROOFING

Description

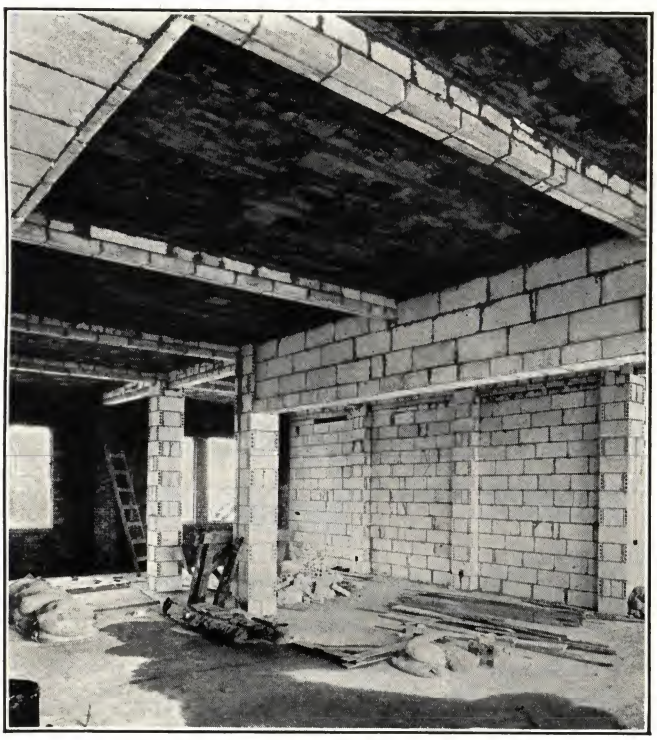
Pyrobar Beam and Girder Fireproofing is made from the same materials and in the same manner as Pyrobar Partitions and Furring Tile, described on page 25.

Pyrobar Shoe Tile, which fit over the lower flanges of the steel, in combination with Pyrobar Partition Tile for side protection are used as beam fireproofing for sections with a flange width not over 9 in., as indicated below. A Pyrobar Shoe Tile is moulded in a double unit, 18 in. long, sufficient for a foot and a half of beam. It is light in weight, easily split, and placed with a minimum quantity of mortar and labor. The double unit reduces breakage, and provides protection for the inner edges during shipment and handling.

For rolled sections and built-up members covered to a depth not exceeding 36 in., all with a flange width greater than 9 in., Pyrobar Soffit Tile, 2 in. thick, are used in combination with Pyrobar Partition Tile for side covering. The Soffit Tile with supporting strap imbedded, project beyond the flanges of the member, providing a support for the side covers. The Soffit Tile is specially moulded at the mill of the proper width, with straps imbedded to act as reinforcement for supporting the tile. It is shipped in units 24 in. long.

For deep built-up members with cover plates, rivets, etc., Pyrobar Angle Tile in combination with Pyrobar Soffit Tile, either 2 in. solid or 3 in. hollow, are used. Angle Tile are shipped in single units 18 in. long, two Angle Tile being required per lineal foot of beam. Soffit Tile 3 in. hollow can be cut on the job from ordinary 3-in. hollow Pyrobar Partition Tile, and held in place with pipe straps.

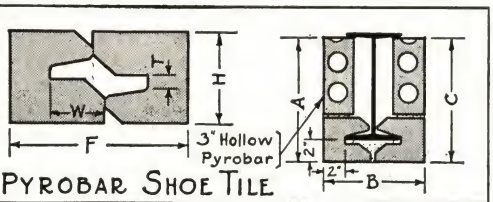
These constructions provide 2 in. of protection to all parts of the steel, and fulfill the requirements of the National Board of Fire Underwriters.



Application of Pyrobar Beam, Girder and Column Covering

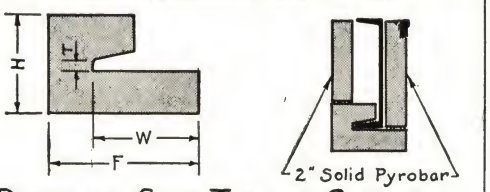
Pyrobar Beam and Girder Covering in Connection with Steel Joint Floors

PYROBAR BEAM AND GIRDER FIREPROOFING WEIGHTS PER LINEAL FOOT OF BEAM



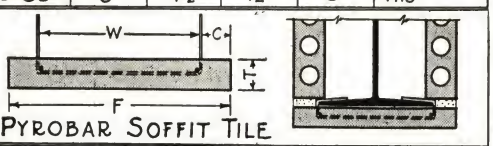
PYROBAR SHOE TILE

TYPE	F	H	T	W	WEIGHT
B-40	7⅜	4¼	½"	2"	12.5 Lbs.
B-50	8¼	4¼	⅝"	2½"	13
B-65	9¾	4¼	13/16"	3¼"	15
B-80	10½	4¼	15/16"	4"	16



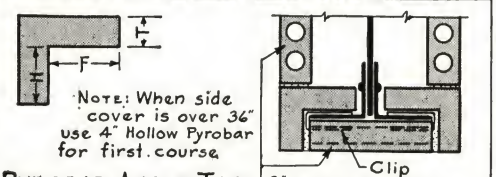
PYROBAR SHOE TILE FOR CHANNELS

TYPE	F	H	T	W	WEIGHT
C-25	7"	4½"	½"	5"	10.5 Lbs.
C-35	8"	4½"	½"	6"	11.5



PYROBAR SOFFIT TILE

TYPE	F	C	T	W	WEIGHT
S-10	15¼"	2½"	2"	10"	13 Lbs.
S-11	15¼"	2"	2"	11"	13
S-12	17¼"	2½"	2"	12"	14.5
S-13	17¼"	2"	2"	13"	14.5
S-14	19¼"	2½"	2"	14"	16
S-15	19¼"	2"	2"	15"	16



PYROBAR ANGLE TILE

TYPE	F	H	T	WEIGHT
L-34	3"	4"	2"	15 Lbs.
L-45	4"	5"	2"	18.5
L-46	4"	6"	2"	20.

DATA ON PYROBAR SHOE TILE					Weight of fireproofing per lin. ft. beam using	
Type shoe	B	Average A and C	A + B + C	Total weight fireproofing per lin. ft. beam	Clay tile	Concrete
B-40 Max. flange width 5"	8" to 9"	6"	21"	15 lbs.	26 lbs.	56 lbs.
		8"	25"	19 lbs.	31 lbs.	75 lbs.
		10"	29"	23 lbs.	36 lbs.	94 lbs.
		12"	33"	26 lbs.	41 lbs.	113 lbs.
B-50 Max. flange width 6"	9" to 10"	6"	22"	16 lbs.	27 lbs.	63 lbs.
		8"	26"	20 lbs.	33 lbs.	83 lbs.
		10"	30"	23 lbs.	38 lbs.	104 lbs.
		12"	34"	26 lbs.	43 lbs.	125 lbs.
		14"	38"	30 lbs.	48 lbs.	146 lbs.
		16"	42"	33 lbs.	53 lbs.	167 lbs.
		18"	46"	36 lbs.	58 lbs.	188 lbs.
		20"	50"	40 lbs.	63 lbs.	218 lbs.
B-65 Max. flange width 7½"	10½" to 11½"	6"	23"	18 lbs.	29 lbs.	72 lbs.
		8"	27"	22 lbs.	34 lbs.	96 lbs.
		10"	31"	25 lbs.	39 lbs.	120 lbs.
		12"	35"	28 lbs.	44 lbs.	144 lbs.
		14"	39"	32 lbs.	49 lbs.	168 lbs.
		16"	43"	35 lbs.	54 lbs.	191 lbs.
		18"	47"	38 lbs.	59 lbs.	215 lbs.
		20"	51"	42 lbs.	64 lbs.	239 lbs.
		22"	55"	45 lbs.	69 lbs.	263 lbs.
		24"	59"	48 lbs.	74 lbs.	287 lbs.
		26"	63"	52 lbs.	79 lbs.	312 lbs.
		28"	67"	55 lbs.	84 lbs.	334 lbs.
B-80 Max. flange width 9"	12" to 13"	6"	25"	19 lbs.	31 lbs.	78 lbs.
		8"	29"	23 lbs.	36 lbs.	104 lbs.
		10"	33"	26 lbs.	41 lbs.	130 lbs.
		12"	37"	29 lbs.	46 lbs.	156 lbs.
		14"	41"	33 lbs.	51 lbs.	183 lbs.
		16"	45"	36 lbs.	56 lbs.	206 lbs.
		18"	49"	39 lbs.	61 lbs.	234 lbs.
		20"	53"	43 lbs.	66 lbs.	260 lbs.
		22"	57"	46 lbs.	71 lbs.	285 lbs.
		24"	61"	49 lbs.	76 lbs.	312 lbs.
		26"	65"	53 lbs.	81 lbs.	339 lbs.
		28"	69"	56 lbs.	86 lbs.	363 lbs.

MASTER SPECIFICATIONS—PYROBAR BEAM AND GIRDER FIREPROOFING

(1) Work Included

All steel (*beams*) (*girders*) (*trusses*) shall be protected with precast gypsum fireproofing.

Note: *If there are any exceptions, so note. List and locate any special requirements not clearly indicated on plans and details.*

(2) Materials

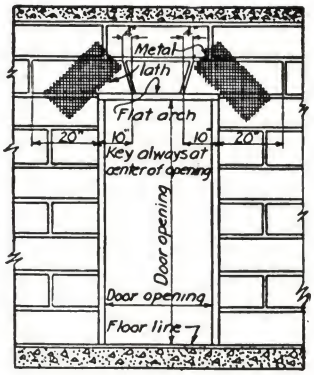
(2a) Fireproofing—All fireproofing shall be Pyrobar Beam Shoe, Angle and Soffit Tile, and Pyrobar (2 in. solid) (3 in. hollow) Partition Tile as made by the United States Gypsum Company. All steel shall be protected with a minimum of 2 in. of precast gypsum.

(2b) Mortar—***Note:*** *Same as "Mortar" under "Materials," page 26.*

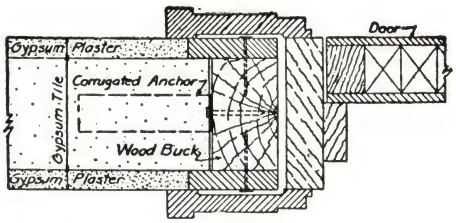
(3) Erection

(3a) By United States Gypsum Company—All fireproofing shall be completely erected by the UNITED STATES GYPSUM COMPANY'S Contracting Division.

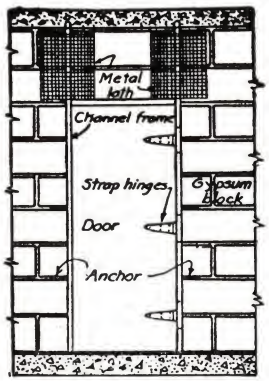
(3b) General—All fireproofing shall be erected in strict accordance with the UNITED STATES GYPSUM COMPANY'S standard details. All units shall be laid in gypsum mortar with full flush joints, true to line and plumb. Joints in alternate courses shall be broken.



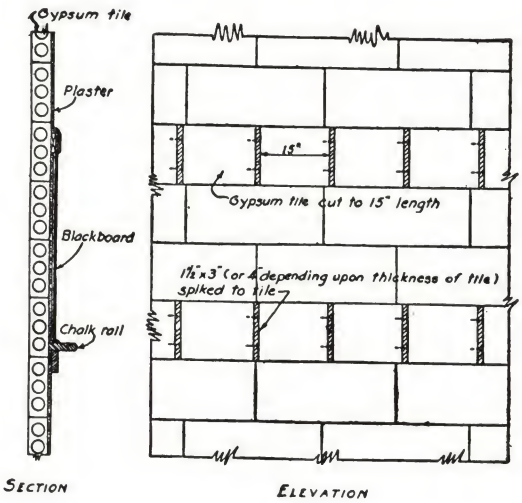
DETAIL SHOWING JACK ARCH CONSTRUCTION



SECTION OF DOOR JAMB SHOWING WOOD BUCK

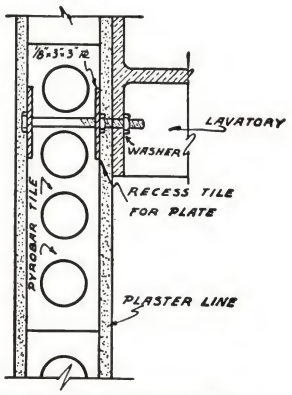


DETAIL OF DOOR WITH CHANNEL IRON FRAME

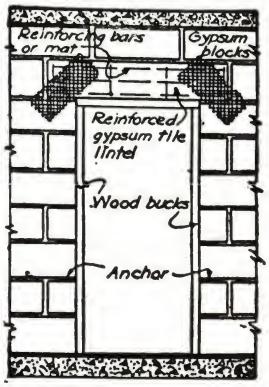


SECTION ELEVATION

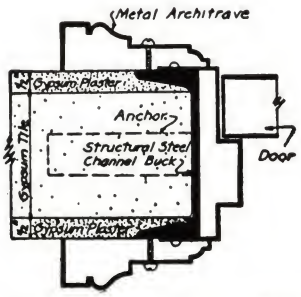
METHOD OF FASTENING SLATE BLACKBOARDS



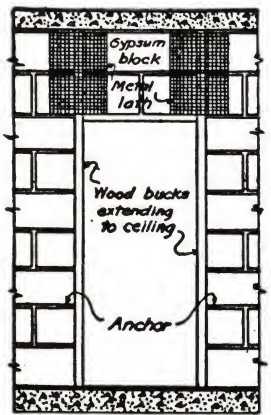
METHOD OF SUPPORTING LAVATORY ON PYROBAR PARTITIONS.



DETAIL SHOWING REINFORCED GYPSUM LINTEL CONSTRUCTION



SECTION OF DOOR JAMB SHOWING METAL BUCK



DETAIL SHOWING WOOD BUCKS

DETAILS—PYROBAR PARTITIONS

USS

CALICEL PRODUCTS, INC.

GENERAL OFFICES AND FACTORY
HAMMOND, IND.
SALES OFFICES IN PRINCIPAL CITIES

(1) Building and Home Insulation.
(2) Acoustical Tile.
(3) Acoustical Plaster.
(4) Sound Deadening.

Calicel INSULATION

(5) Calistone Roof Slabs.
(6) Insulating Concrete Aggregate.
(7) Refractory Insulation.
(8) Pulverized Fillers.

For Calicel (H) Building Insulation; Acoustical Tile and Plaster, and Sound Deadening, see Manufacturers' Index.

CALISTONE ROOF AND FLOOR SLABS AND INSULATING CONCRETE AGGREGATE

General Description of Material and Purposes

Calistone is a light weight insulating concrete made from Calicel Concrete Aggregate mixed with Portland cement or gypsum and is used for the following purposes:

(1) Roof slabs, over structural framing.
(2) Floor slabs, over junior beams, bar joists, etc.
(3) Monolithic insulation over concrete roof slabs.
(4) Monolithic sound-deadening fill between floor sleepers or between rough concrete floor slab and finished floor, such as terrazzo, tile, compo, etc.
(5) Monolithic insulation, either inside or outside of smoke flues, breechings, etc.

It is also used to a great extent in the industrial field as a monolithic, refractory insulator in the construction of dry kilns, furnaces, boilers, etc. Portland or high alumina cement only is recommended as its cementing agent in the latter cases.

The Material and Manufacture

Calicel, basically, is highly expanded stone. It is a cellular mineral, a refractory insulator, a synthetic combined silicate of lime and alumina formed at temperatures in excess of 2000° F., being so cooled that the molten mass is expanded from 10 to 40 volumes. This highly cellular structure somewhat resembles petrified sponge. Subsequent refining and grading operations produce finished Calicel which serves as an aggregate for Calicel acoustical materials as well as for numerous thermal insulators.

Adaptability and Methods of Use

Calicel Concrete Aggregate is mixed with Portland cement and water in much the same manner as ordinary concrete aggregates. The resulting concrete, known as Calistone, is then deposited in the desired thickness (usually 2 to 3 inches) over a supporting member which may be metal lath, Steel-tex, galvanized corrugated iron, wall or plaster board, or a wood or concrete deck. Certain of these supports serve as their own reinforcement, but in some cases it is essential to add reinforcement, either in the form of standard wire mesh or rods.

Designing and Engineering Service

The uses of Calistone are so varied as to make it impractical to incorporate details in this article, but the manufacturer maintains a skilled engineering force for consultation with architects and engineers, and welcomes discussion of individual problems. Further data, reports, etc., in pamphlet form will be forwarded upon request.

A Single Grain of Calicel Magnified 20 Diameters

The unretouched photo shows the minute air cell construction that accounts for the superior insulating and sound deadening qualities of Calicel

Merits

Though Calistone, as constituted at present, is not represented as a structural concrete, it furnishes remarkable strength, particularly so, when its weight of approximately 50 pounds per cubic foot is considered—its strength being as great as, often far greater than, other similar-purpose fireproof materials of equal density.

It is naturally absolutely vermin, rodent and fire proof.

Portland cement Calistone will not soften, disintegrate or dissolve when subjected to excessive saturation.

It is more free from expansion or contraction than standard concrete due to the nature of the aggregate.

Splendid sound-deadening and sound-absorbing qualities are had as Calicel Concrete Aggregate is essentially the same aggregate as used in the manufacture of Calicel Acoustical Tile and Plaster and Calicel Sound Fill.

The following data is quoted from reports rendered by Prof. J. C. Peebles of the Armour Institute of Technology:

Thermal conductivity of Calistone, B.t.u.'s per hour per 1 in. thickness .896. Transmission in B.t.u.'s per hour per square foot per degree difference in temperature, including 5 ply roof covering:

3-in. thickness ..... .196
2½-in. thickness ..... .22
2-in. thickness ..... .251

Note: *Insulation values are somewhat better when gypsum displaces Portland cement as a cementing agent.*

Short Specification

Calistone, prepared in accordance with the specification of the manufacturer, Calicel Products, Incorporated, Hammond, Indiana, from Calicel Concrete Aggregate and Portland cement shall be placed in the following locations (or as indicated by plans); the installation being made as per manufacturer's instructions, by or under the supervision of, his distributor or approved contractor, ..., of .....

AEROCRETE CORPORATION OF AMERICA

Aerated Concrete Products

551 Fifth Avenue
NEW YORK, N. Y.

LICENSED REPRESENTATIVES IN THE UNITED STATES

CHICAGO, ILL., The Aerocrete Western Corporation, 612 No. Michigan Avenue
NEW YORK, N. Y., H. W. Bell Co., 2590 Park Avenue
NEW YORK, N. Y., Brennan & Sloan, Inc., 274 Madison Avenue
BRUNSWICK, ME., Maine Concrete Company

REPRESENTATIVES IN FOREIGN COUNTRIES

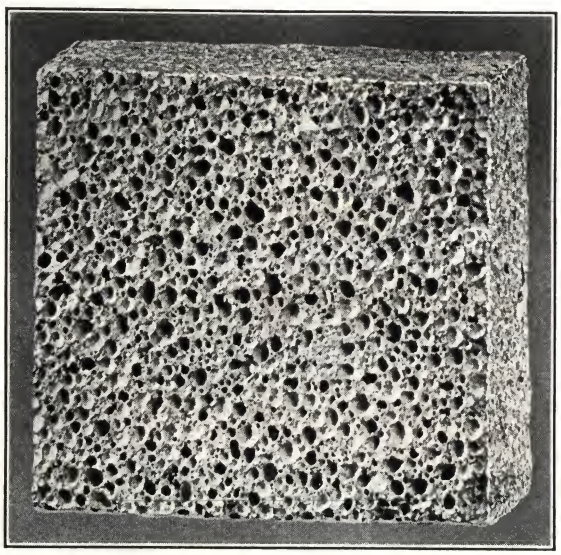
MONTREAL, QUE., The Aerocrete Corporation of Canada
LONDON, ENGLAND, Aerocrete, (Britain) Limited
PARIS, FRANCE, Aerocrete (S. A. France)
STOCKHOLM, SWEDEN, A. B. Vallevikens Cementfabrik
BERLIN, GERMANY, Torkret Gesellschaft, M. B. H.
SHANGHAI, CHINA, China Aerocrete Corporation

AEROCRETE
REG. TRADE MARK
WORLD PATENTS

GENERAL PROPERTIES OF AEROCRETE

Aerocrete is a porous concrete made through the aeration of a mixture of cement, aggregates, and water, by the action of a specially prepared compound, which is manufactured by the AEROCRETE CORPORATION OF AMERICA and its licensed representatives, and added to the concrete mix on the job. The technique of mixing and placing Aerocrete is practically identical to that of ordinary concrete, but the plasticity of the Aerocrete slurry and the fact that much less material is handled *enable the contractor to place Aerocrete at a labor cost that is much less than the cost of placing ordinary concrete.*

Being a concrete product, Aerocrete has the permanence of ordinary concrete, but the introduction of pores in the material makes it light, highly soundproof, heat insulating, and fireproof. Proportions of mix as well as degree of aeration may be varied within wide limits, and properties will vary accordingly.



Aerocrete Block Showing Actual Size Air Cells

Weight

Aerocrete can be made to weigh from 30 to 80 lbs. per cu. ft. Stone concrete weighs 144 lbs. per cu. ft.

Compressive Strength

The lightest grades of Aerocrete have a compressive strength of 250 lbs. per sq. in. The strength increases with the weight. 80-lb. Aerocrete has a compressive strength of 1300 to 1500 lbs. per sq. in.

Soundproofness

Owing to the porous structure of Aerocrete, the interior surface of the material becomes immensely enlarged. Sound waves passing through the material strike cell wall after cell wall and are subjected to absorption in the surface of the cells as well as weakening by the inertia of the cell walls. For these reasons, soundproofness is one of the outstanding qualities of Aerocrete. Numerous comparative tests performed by experts on sound insulation have established the superior qualities of Aerocrete as a deadener of sound. *A slab of Aerocrete transmits only from one-fourth to one-sixth of the sound transmitted by many other materials recognized as having sound retardant properties.*

Heat Insulation

The following table gives a comparison of Aerocrete with other materials from a heat transmission standpoint.

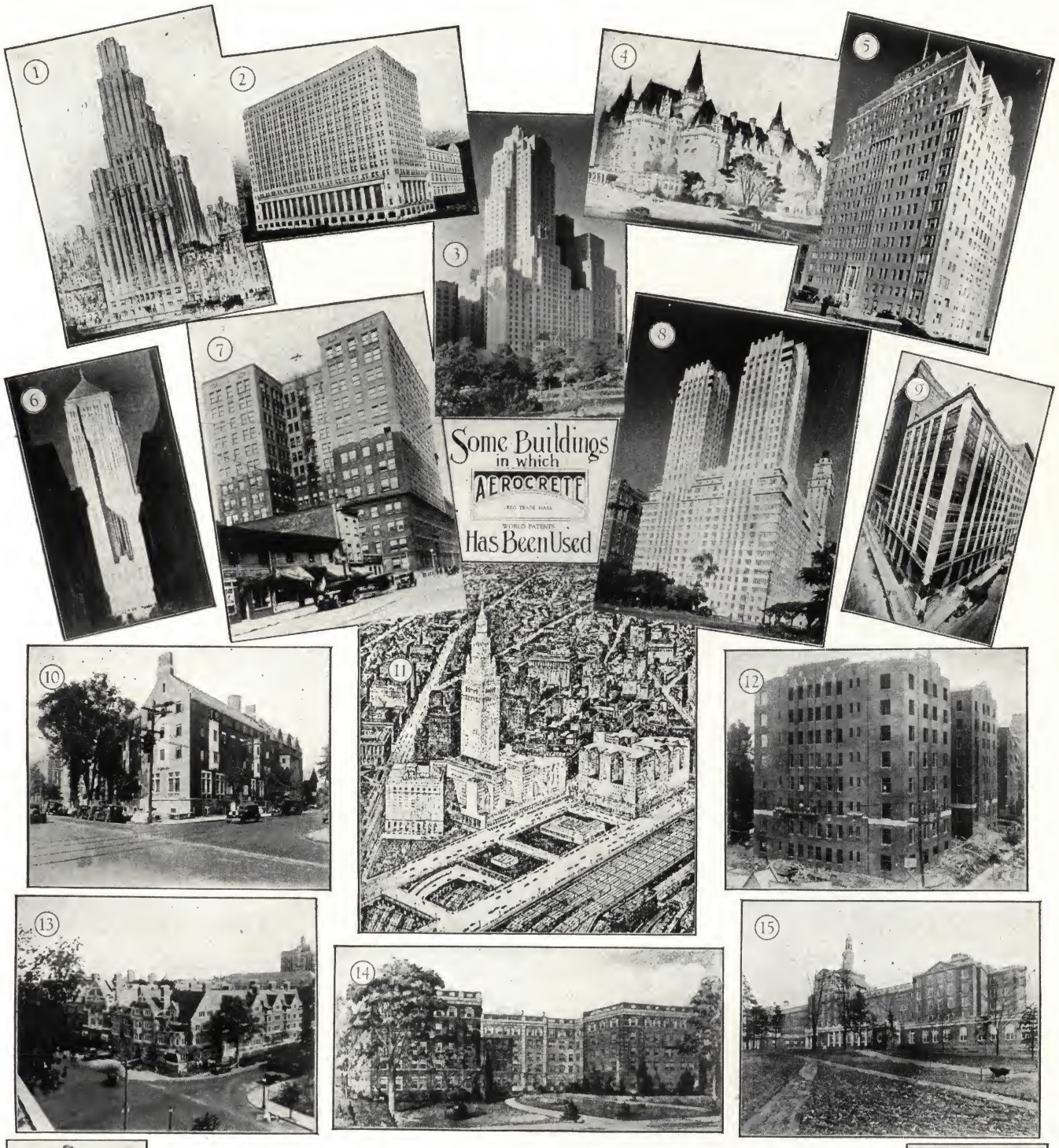
HEAT TRANSMISSION

Material	Wgt. per cu. ft., lbs.	C*	Equivalent thickness, in.	Authority
Corkboard	10	0.30	1.00	Bureau of Standards
Aerocrete	30	0.69	2.30	Peebles, Armour Institute
Aerocrete	40	1.06	3.54	
Aerocrete	50	1.44	4.80	
Aerocrete	60	1.80	6.00	
Aerocrete	70	2.18	7.27	
Brickwork (dry)	132	4.00	13.33	Willard, Lighty & Harding
Concrete	140	8.30	27.70	
Cinder concrete	110	5.20	17.35	Peebles, Armour Institute
Gypsum (roof tile)	...	1.20	4.00	

*C—Coefficient of heat transmission in b.t.u. per hour, per square foot, per inch thickness, per degree difference Fahrenheit.

Fireproofness

Due to its high insulating qualities, Aerocrete is more fireproof than ordinary concrete. It withstands the effect of a blazing fire for hours without peeling off, cracking, or crumbling.

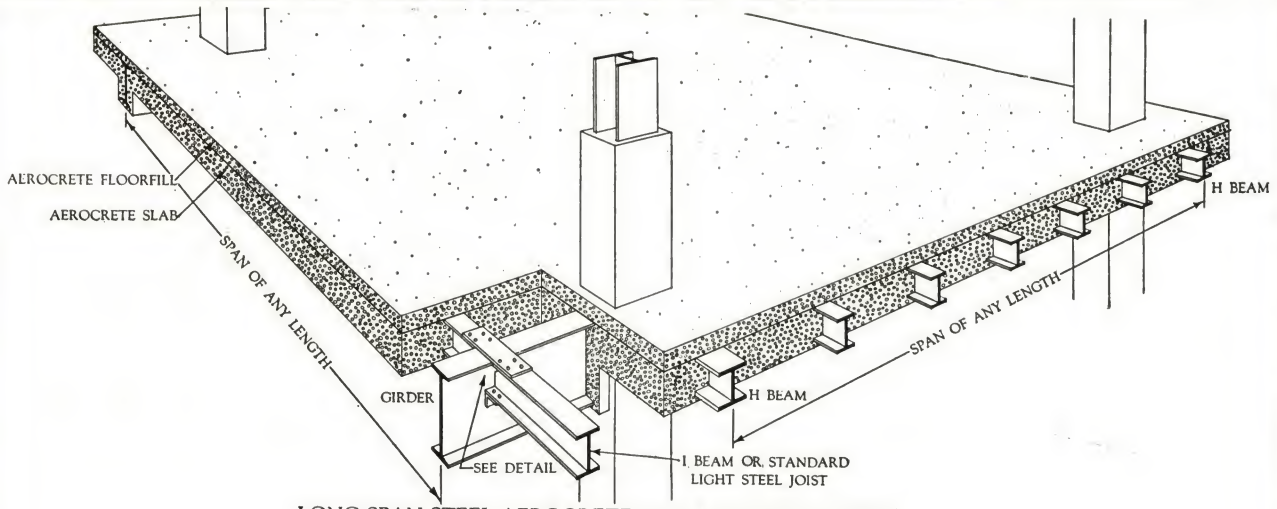


No.	Building	Location	Architect	Part Used For
1	Town House	New York, N. Y.	Bowden & Russell	Floor fill, partition slabs
2	Northwestern Bank Bldg.	Minneapolis, Minn.	Graham, Anderson, Probst & White	Floor fill
3	Essex House	New York, N. Y.	A. E. Lefcourt	Partition slabs
4	Chateau Laurier	Ottawa, Que.	J. S. Archibald	Roof slabs, partition slabs, floor fill
5	No. 1 Beekman Place	New York, N. Y.	Sloan & Robertson	Floor fill
6	Board of Trade Bldg.	Chicago, Ill.	Holabird & Root	Floor fill
7	Bethlehem Steel Bldg.	Bethlehem, Pa.	Graham, Anderson, Probst & White	Arches, fireproofing, precast ceiling slabs in six added upper stories
8	Majestic Apartments	New York, N. Y.	Irwin S. Chanin	Partition slabs
9	Globe Insurance Bldg.	New York, N. Y.	A. D. Shephard	Arch construction
10	Y. M. C. A. Bldg.	New Haven, Conn.	Douglas Orr	Long span floors
11	Cleveland Terminal Group of Buildings	Cleveland, Ohio	Graham, Anderson, Probst & White	Floor fill
12	Fleetwood Apartments	Mt. Vernon, N. Y.	Stern & Peyser	Long span floors
13	Sterling Law Bldgs.	New Haven, Conn.	J. G. Rogers	Roofing slabs
14	Fairfax Hall Apartments	Woodmere, L. I.	H. G. Wiseman	Long span floors
15	Aetna Life Bldg.	Hartford, Conn.	J. G. Rogers	Floor fill
16	Eastman Bldg.	Rochester, N. Y.	Gordon & Kaelber	Arch construction fireproofing
17	Royal Bank of Canada	Montreal, Que.	York & Sawyer	Floor fill, partition slabs

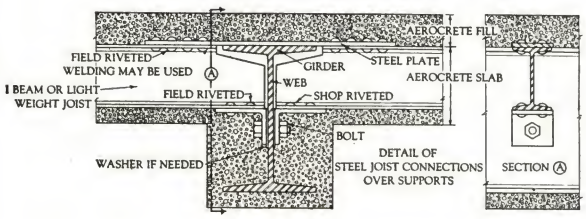
APPLICATION OF AEROCRETE

1. LONG SPAN STEEL-AEROCRETE FLOORS

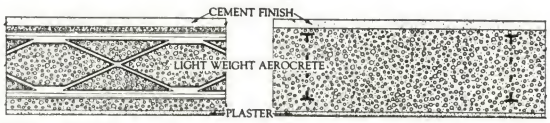
In designing these floors, the engineers of the AEROCRETE CORPORATION OF AMERICA have succeeded in utilizing the peculiar qualities of Aerocrete—its soundproofness, low weight, and fireproofness—to the greatest advantage. At the same time, rigid steel only, totally embedded in light weight Aerocrete, is depended upon to take the stresses in the floor. This design, protected by U. S. patents, offers outstanding technical and economical advantages in most classes of fireproof buildings, particularly notable in apartment houses, schools, hospitals, and office buildings. Although introduced to the building industry only a short time ago, Long Span Steel-Aerocrete Floors have already created a very wide interest among the leading architects and builders of this country, and this floor construction is being used in some of the finest buildings going up in America today.



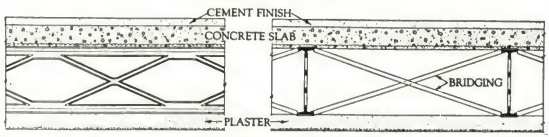
LONG SPAN STEEL AEROCRETE FLOOR CONSTRUCTION
LIGHT STANDARD I BEAMS EMBEDDED IN AEROCRETE CONTINUOUS SPANS



DETAIL OF STEEL JOIST CONNECTIONS OVER SUPPORTS



LONG SPAN STEEL AEROCRETE FLOOR CONSTRUCTION
BAR JOIST EMBEDDED IN LIGHT AEROCRETE, EXCEEDINGLY RIGID AND SOUNDPROOF, FIREPROOF YET LIGHT, CONTINUOUS SPANS.



OLD TYPE OF BAR JOIST CONSTRUCTION CONCRETE SLAB ON TOP OF BAR JOIST WEIGHT PRACTICALLY THE SAME AS BAR JOIST AEROCRETE CONSTRUCTION, BUT IS LESS FIREPROOF AND LESS SOUNDPROOF.

LONG SPAN STEEL-AEROCRETE FLOOR CONSTRUCTION

Construction Characteristics

Light weight steel bar joists or I-beams are placed between the girders either in continuous or simple span at the same time as the general steel construction is erected. Aerocrete of a light grade is then poured on forms of wood or steel suspended from the steel construction, so that the steel members are entirely embedded in the porous, highly sound-insulating and fire-resisting Aerocrete which, with the carrying steel joists, give a *floor that has an exceedingly low weight, is thoroughly fireproof, and impervious to sounds that ordinarily occur in a building.* When steel forms are used, they are left in the floor, whereby the speed of construction is increased, and an excellent base for the plaster is obtained. The spacing of the I-beams, or bar joists, is generally from 2 to 4 ft., giving ample strength of the Aerocrete slab between the steel members, even without reinforcement. However, the use of a light reinforcement (for instance, welded fabric of the lightest type) in conformance with standard engineering practice is recommended.

The actual weight of the floor, including steel beams but exclusive of plaster and finish, is about 30 lbs. per sq. ft., whereas the weight of the lightest of present types of fully fireproof long span construction is more than twice as much. *The depth of the floor slab, with standard I-beams as carrying members, is only 7½ ins. for 24-ft. span,* exclusive of fill and finish. Compared to standard methods of construction, a saving in height amounting to several inches is effected by the use of Long Span Steel-Aerocrete Floors. *The ceiling is smooth.*

Among the many other advantages embodied in this type of construction, the high speed of erection—one floor per day—and the fact that the forms may be removed in two days are notable. This and the saving of about 18% in structural steel columns and girders due to the exceedingly low dead load make for inexpensive construction. Due to the rigidity of this floor construction obtained by the stiffening effect of the thick Aerocrete slab between the joists, deflections and vibrations are brought to a minimum.

Outstanding Features of Long Span Construction

(1) Smooth ceiling.
(2) Exceedingly low dead load.
(3) Thin slab.
(4) Practically impervious to sound.
(5) High speed of erection; forms removed inside of 48 hours after pouring; low construction cost.
(6) Floor may be designed for any loading and for any span desired.

When open steel bar joists are used in Long Span Steel-Aerocrete floor construction, it actually means that the hitherto commonly used bar joist construction has been transformed from a merely fire-resistant into an absolutely fireproof construction, more rigid and a better sound deadener than the old type of construction. Any approved type or make of bar joists may be employed in Long Span Steel-Aerocrete floors. A notable example of this construction is the new Y. M. C. A. building at New Haven, Connecticut, in which the floor spans averaged 29 ft. in length. Particular attention was given to this job by the members of the Connecticut chapter of American Institute of Architects at their meeting in New Haven, April 9th, 1931.

Live Load Test on a Typical Long Span Steel-Aerocrete Floor

The following test conducted by the Gunvald Aus Company, Consulting Engineers, New York City, on a panel of finished Long Span Steel-Aerocrete floor in the Grand Gardens Apartments, Fleetwood, New York, on August 5, 1931, gives an indication of the strength of this type of construction:

"A span of 6-in. I 12.5, 19 ft. 9 in. long, 3 ft. o.c. continuous over the supports, with 7½ Aerocrete slab, 2 in. Aerocrete fill and ⅞-in. underflooring on wood sleepers was selected for the test.

A 6 ft. wide strip on this floor was uniformly loaded with cement bags to 36 lbs. per sq. ft. and the deflection for this load was found to be $\frac{3}{32}$ in.; the load was then increased to 60 lbs. per sq. ft., or 1½ times the figured live load, and the deflection was then measured at ⅛ in.

The floors were found to be extraordinarily stiff and free from vibration. After the load was removed, the floor construction returned to its original position."

Long Span Steel-Aerocrete Floor means a better floor for less money.

2. AEROCRETE ARCH CONSTRUCTION

Designed for spans up to 8 ft. this type of construction has found wide uses in buildings where flat ceiling is not required. *Its outstanding characteristics are exceedingly low weight, resulting in saving in structural steel and low construction costs, ease of placing, soundproofness and fireproofness.*

Thickness of arch, 4 ins.

Weight of floor, including fireproofing and steel in reinforcement, beams and girders, 30 lbs. per sq. ft.

Structural Aerocrete Arch Construction gives a better floor than cinder concrete arches. Aerocrete, being free from chemical impurities, does not cause corrosion of reinforcement. It weighs considerably less than cinder concrete and is a better sound-deadener.

When new stories are to be put up on old buildings, the use of Aerocrete instead of concrete or cinder concrete construction often enables the builder to erect an extra story, owing to the low weight of Aerocrete arches.

3. ROOF SLABS

Aerocrete is an ideal material for the manufacture of precast roofing slabs. Its low weight results in saving of structural steel while its excellent heat insulating qualities make for small heat losses and consequently low fuel cost. The cost of precast Aerocrete slabs is low, as well as the cost of erecting them. Therefore, *Aerocrete roofs are one of the cheapest kinds of permanent roofs for heated buildings.* And they last forever. Moisture does not affect them.

Aerocrete roofing slabs present a smooth undersurface and are an excellent base for built-up roofing.

Long Span Reinforced Precast Roof Slabs—Spans up to 8 ft., thickness 3 to 4 ins., carry a uniform load of more than 400 lbs. per sq. ft. Weight of slab, 20 lbs. per sq. ft.

Short Span Reinforced Precast Roof Slabs of Nailing Aerocrete—Standard dimensions, 24x32 ins., 2½ to 3-in. thickness. Weight of slabs, 10 to 15 lbs. per sq. ft. *Made from Aerocrete that holds nails.*

4. SOUND PROOF PARTITION SLABS

We manufacture Aerocrete partition slabs for use in apartment houses, hotels, hospitals, and other buildings in which good sound insulation is a factor of primary importance. By using Aerocrete soundproof partition slabs, the builder is able to maintain standard thickness of the partition walls without impairing the sound insulation, thereby saving valuable rental space.

5. AEROCRETE FLOOR AND ROOF FILL

Dependent on the purpose for which it is used, Aerocrete fill is made in weights from 30 to 80 lbs. Like all *Aerocrete, the fill is chemically pure, therefore no danger of corrosion* is present when iron pipes and conduits are embedded in the fill.

Compared to other kinds of fill, Aerocrete is more sound deadening and lighter. Saving in dead weight of the floor means saving in structural steel. Furthermore, it is inexpensive because it is easy to place and the quantity of material to be handled is smaller. When poured, the Aerocrete mass is quite fluid and fills easily every crevice in the floor, space in corners, and under pipes and ducts. *It gives a monolithic job of highly soundproof and insulating porous concrete, verminproof and permanent.*

SPECIFICATIONS

Specifications for the different applications of Aerocrete will be submitted to architects and contractors upon request, as well as assistance given in the working out of designs in which Aerocrete may be advantageously employed.

The manufacturing process, designs and applications of Aerocrete are protected by a number of United States and foreign patents.

THE NAILCRETE CORPORATION

Manufacturer of the Original Nailing Concrete

105 West 40th Street
NEW YORK, N. Y.

SELLING AGENTS IN ALL THE PRINCIPAL CITIES IN THE UNITED STATES

Product

NAILCRETE (Nailing Concrete). Patented—name registered.

For Nailcrete Nailable Building Blocks, see Manufacturers' Index.

Nailcrete (Nailing Concrete)

Nailcrete is a cementitious, fibrous, *all-mineral* fireproof compound, containing no animal or vegetable matter, no acids, alkalis or any substance injurious to metals, wood or other construction materials coming in contact with it.

Nailcrete is regularly supplied in burlap bags containing in each case the correct quantity for the mix used. It is to be mixed on the job with portland cement, screened sand and clean water, and screeded smooth and level. Complete instructions with each shipment.

Origin

Nailcrete has been in successful commercial use for more than 20 years. It was developed after extended laboratory research and tests conducted by Grosvenor Atterbury, F.A.I.A., collaborating with the Russell Sage Foundation in connection with their economic construction developments.

Advantageous Qualities and Physical Properties

Nailcrete is absolutely fireproof and verminproof; will not shrink, swell, or rot; is unaffected by dampness, a poor conductor of heat and an effective sound deadener.

Nailcrete has the same compressive strength as 1-3-6 cinder concrete and is 20% lighter (Nailcrete weighs about 96 lb. per cu. ft.) thereby saving steel in building design. Its nailing properties are unsurpassed, as Nailcrete holds nails better than pine.

Coefficient of expansion, also setting and drying periods are substantially the same as those of cinder concrete. Nailcrete calls for the same precautions against freezing, quick drying, etc., as are necessary with ordinary concrete.

Chrysler Building Tower, New York, N. Y.
WILLIAM VAN ALEN, Architect
In process of construction
Insert shows application of Nailcrete

Uses of Nailcrete

Nailcrete is used without sleepers and without underflooring or sheathing, and is more durable than the ordinary construction using wood sleepers and cinder-concrete fill. It is especially suitable as a fireproof nailing base for floors, roof covering of various kinds, etc., as follows:

(a) Subfloors—Nailcrete is laid 2 in. thick as a subfloor on top of the structural slab or floor arch, to which is directly applied wood flooring, cork tile, etc., giving the floor greater resiliency and making it more impervious to sound. (See specifications.)

(b) Reinforced Floor Slabs for Metal Lumber—Nailcrete is used 2 in. thick on top of metal lath placed on metal lumber or bar joist floor beams. In this case the Nailcrete acts as fireproof floor slab and as a nailing base for the finished wood floor. (See specifications and table of safe loads.)

(c) Roof Coating—A fireproof, rotproof nailing base 1½ to 2 in. thick directly on top of roof slab to receive tile, slate, copper, etc. (See specifications.)

(d) Reinforced Roof Slab—A poured-in-place construction on rafters of steel, metal lumber or bar joists. (See specifications and table of safe loads.)

(e) Precast Lightweight Roof Slabs—Correspondence is solicited for this form of construction which is now available in certain sections.

(f) Nailing Strips for Carpets—Poured in place where concrete floors are to be covered with carpets.

(g) Plaster, Interior and Exterior—For interior plastering, especially for fireproofing, sound-insulating and as a nailing base for wood paneling; for exterior plastering or penthouse walls, skylight curbs, etc., to receive the sheet metal covering. (See specifications.)

NAILCRETE SLABS—SAFE LOADS IN POUNDS PER SQUARE FOOT

Gross sectional area of steel in sq. in. per ft. slab	Thickness of Nailcrete above steel	Span in feet									
		1½	2	2½	3	3½	4	4½	5	5½	6
⅜-in. Hy-Rib, Ribplex or equal, .061 sq. in.	2 in....	480	312	176	122	....	....	....	....	....	....
	2½ in....	....	....	232	161	118	91	....	....	....	....
	3 in....	....	....	....	....	144	110	87	70	....	....
¾-in. Hy-Rib, Ribplex or equal, .1407 sq. in.	2 in....	....	....	....	158	114	87	....	....	....	....
	2½ in....	....	....	....	230	171	130	102	....	....	....
	3 in....	....	....	....	....	233	177	139	113	....	....
	3½ in....	....	....	....	....	....	228	180	146	121	....
	4 in....	....	....	....	....	....	....	238	193	159	134

Nailcrete weighs about 96 lb. cu. ft. or 8 lb. per in., 1 ft. square.
Table based on WL/10. For WL/8 (or simple span), deduct 20% from above.
Brace self-centering lath to support wet Nailcrete.
Safe loads on spans above 6 ft. furnished on request.
Total live and dead load on tile roofs: 2-ft. slab, 66 lb.; 2½-ft., 70 lb.; 3-ft., 74 lb.; 3½-ft., 78 lb.; 4-ft., 82 lb. per sq. ft.

Specifications for Nailcrete

Note: Always specify Nailcrete by name.

Materials—Nailcrete shall be made with portland cement and sand strictly in accordance with the specifications of the manufacturer. All sand shall be sharp, clean, and screened through ¼-in. mesh.

Preparatory Work—Immediately before Nailcrete is laid, the surface to be covered shall be swept broom-clean, thoroughly wetted and grouted.

Setting—All Nailcrete shall be allowed to set properly before being walked on.

Note: Ordinarily 2 days in summer and 3 days in winter.

Nailcrete Subfloors—On structural floor construction Nailcrete shall be laid 2 in. thick and screeded, and, if necessary, troweled, to a level.

When Nailcrete is dry, the surface shall be given a brush coat of asphaltic waterproofing before flooring is laid. Flooring to be nailed with 8d cut nails, driven at an angle of approximately 45°.

Note: For high class work specify (under the heading of Carpentry) 1 layer of tarred paper (not less than 2-ply) additional deadening felt, if desired, and the finish wood flooring to be used. *Underflooring* is *never* necessary.

On Metal Lumber Beams—Cover the floors of rooms, etc. (specify which ones are to be covered), with metal lath secured directly to the beams (not over 2 ft. apart) and on top of the metal lath put a bed of Nailcrete not less than 2 in. thick at the thinnest point, screeded level to receive the finish flooring specified under Carpentry.

Note: In high class work specify paper as above. Even in work of the highest class underflooring is unnecessary.

Nailcrete Roof Coating—The structural roof construction shall be covered with 2 in. of Nailcrete.

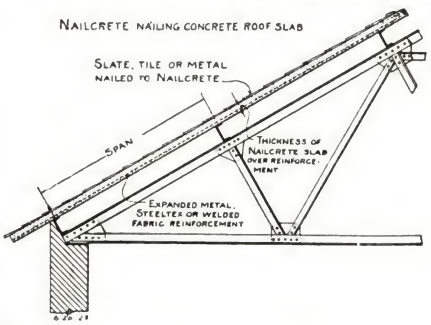
Note: If slate are thicker than ¾ in., consult THE NAILCRETE CORPORATION as to the thickness of the Nailcrete.

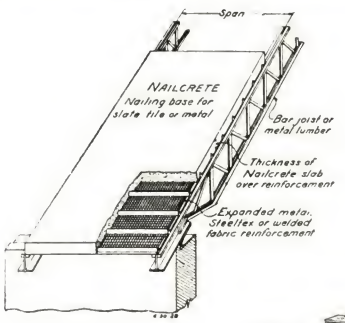
Reinforced Sloping Roof Slab—Cover steel rafters with self-centering lath (as specified by manufacturers) or pour in place fabric-reinforced Nailcrete slab ..... in. thick. (See table for areas of steel and safe loads.)

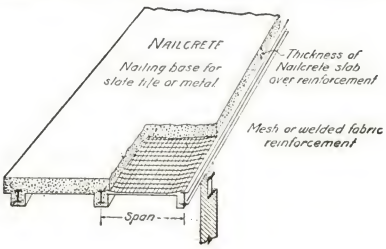
Plaster—***Interior***—Plaster interior walls to an approved finish, true and even as per instructions of THE NAILCRETE CORPORATION.

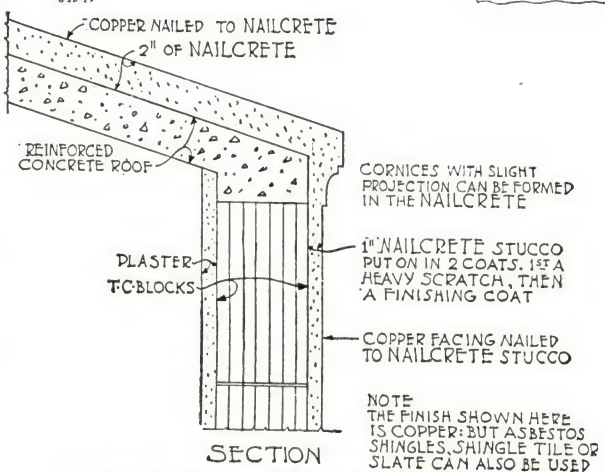
Exterior—Plaster the exterior of penthouse walls, skylight curbs, etc., with Nailcrete plaster 1 in. thick in 2 coats, scratch and finish, troweled (or floated) true and even.

Note: If the Nailcrete plaster is to be applied to gypsum blocks, the blocks should be covered first with proper bonding material, and the Nailcrete is then to be applied while the bonding material is still tacky.

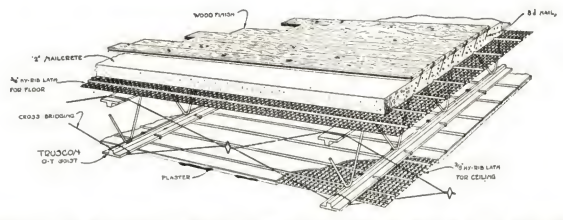




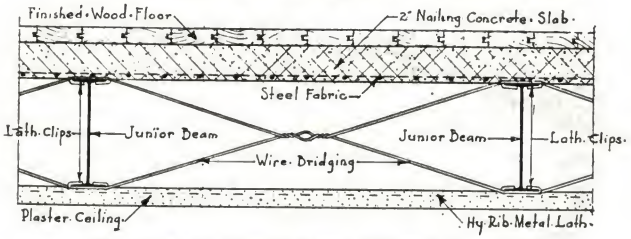




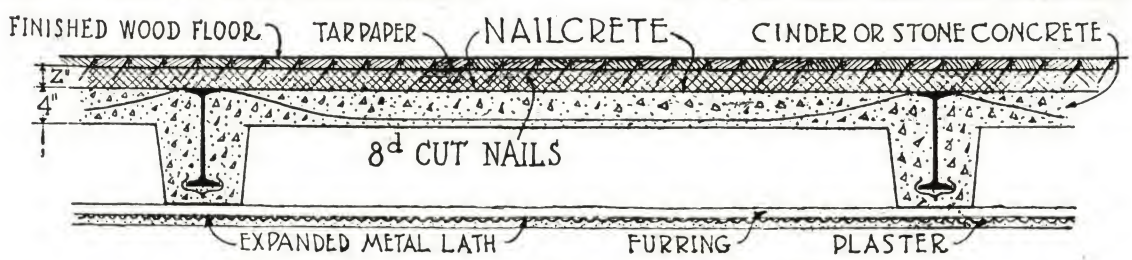
Typical Penthouse Wall and Roof Construction



Method of Applying Nailcrete Over Steel Joist and Hy-Rib Reinforcement as a Nailing Base for Wood Floors



Bar Joist or Junior Beam Floor Construction



Typical Reinforced Stone or Cinder Concrete Floor Construction

Typical Examples of Nailcrete Construction

ESTABLISHED 1920

PORETE MFG. CO.

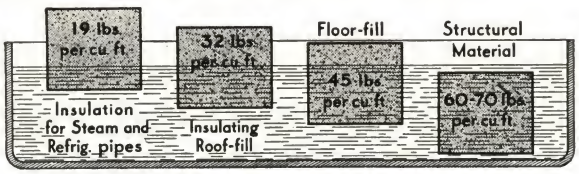
Manufacturers of Lightweight Concrete Products

Porete Avenue
NORTH ARLINGTON, N. J.

Products

PRECAST SLABS for ROOFS and FLOORS.
RIB STEEL ROOFS and FLOORS.
PORETE FILL, lightweight (cast in situ) for:
(a) structural floors
(b) on top of floors and roofs
(c) roof insulation
LONG SPAN PRECAST UNIT FLOOR SYSTEM.
SHORT SPAN PRECAST UNIT FLOOR SYSTEM.
PORETE NAIL-FIL NAILING CONCRETE.

For our page on Precast Concrete Decks for Stadiums, etc., see Manufacturers' Index.

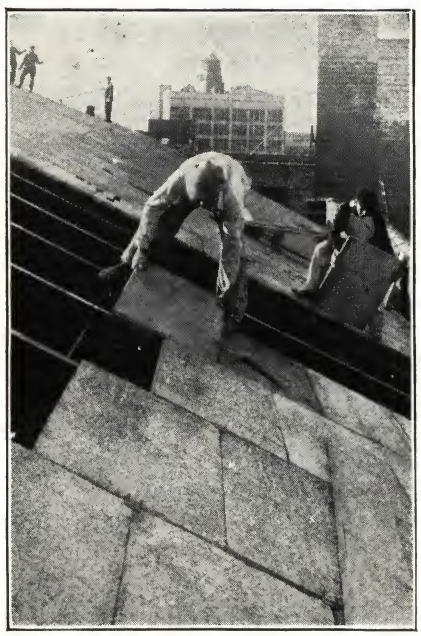


What Porete Is

Porete is a lightweight concrete made of portland cement and sand. It is of uniformly honeycombed structure and combines the durability of concrete with the lightness of wood. Porete is made of a very rich cement mix and any reinforcing metal is thoroughly coated and protected against corrosion.

Porete can be cast in different weights from 19 lbs. per cu. ft. to 70 lbs. per cu. ft. and heavier, for the different purposes illustrated on this page.

On account of the air cells which it contains, it is a good heat and sound insulator and a better fire resisting material than solid concrete, because of its low heat conductivity. Its permanency is equivalent to that of concrete and its strength improves with age.



Laying Porete Slabs

Precast Roof Decks

Advantages—Porete Roof Slabs are a factory controlled product, accurately reinforced. In combination with a cement finish, which is applied in the field, they make a light fireproof roof.

Porete roofs can be adapted to any roof design, flat or slanting.

They are easily erected—even in cold weather.

They weigh only 7 lbs. per sq. ft. for the short span.

A Porete Roof will carry a live load of over 50 lbs. per sq. ft. with a factor of safety of five. Buildings covered with Porete will cost less to heat, because Porete is a good heat insulating material.

Porete Roof Decks present a clean, smooth stone finish on the underside.

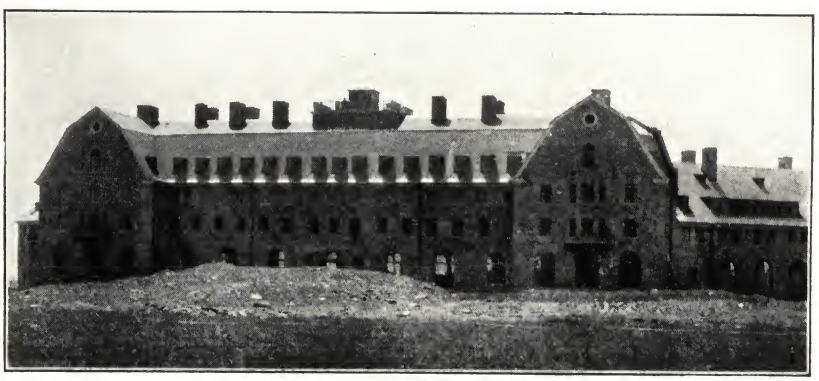
Due to their light weight there is a saving in the steel of the supporting trusses, especially on the larger spans.

CHANNEL PURLINS FOR PORETE-SLAB ROOF

Purlins Spaced 2'-8" c.c.
Weight per Sq. Ft. of Purlins 3 lbs + Porete 7 lbs + Waterproofing 5 lbs. = 15 lbs. Total

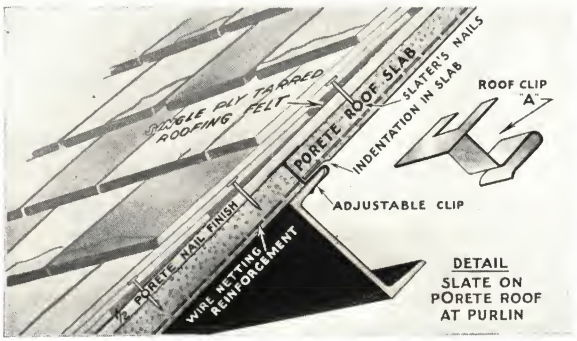
Live Load 30 lbs per Sq. Ft. Total 45 lbs. per Sq. Ft					Live Load 40 lbs. per Sq. Ft. Total 55 lbs. per Sq. Ft.				
Span in Feet	Section Modulus Required	Section	Section Modulus of Channel	Wt. of C per sq. Ft. of Roof	Span in Feet	Section Modulus Required	Section	Section Modulus of Channel	Wt. of C per. sq. Ft. of Roof
6	0.40	3"×4.1 C	1.1	1.54 lbs	6	0.49	3"×4.1 C	1.1	1.54 lbs
7	0.55	"	"	"	7	0.68	"	"	"
8	0.72	"	"	"	8	0.88	"	"	"
9	0.91	"	"	"	9	1.11	"	"	"
10	1.12	4"×5.4 C	1.9	2.02 "	10	1.38	4"×5.4 C	1.9	2.02 "
11	1.36	"	"	"	11	1.66	"	"	"
12	1.62	"	"	"	12	1.98	"	"	"
13	1.90	"	"	"	13	2.32	5"×6.7 C	3.0	2.51 "
14	2.20	5"×6.7 C	3.0	2.51 "	14	2.69	"	"	"
15	2.53	"	"	"	15	3.10	"	"	"
16	2.88	"	"	"	16	3.52	6"×8.2 C	4.3	3.07 "
17	3.25	6"×8.2 C	4.3	3.07 "	17	3.97	"	"	"
18	3.64	"	"	"	18	4.46	"	"	"
19	4.06	"	"	"	19	4.96	7"×9.8 C	6.0	3.67 "
20	4.50	7"×9.8 C	6.0	3.67 "	20	5.50	"	"	"
21	4.96	"	"	"	21	6.06	"	"	"
22	5.45	"	"	"	22	6.65	8"×11.5 C	8.1	4.31 "
23	5.95	"	"	"	23	7.27	"	"	"
24	6.48	8"×11.5 C	8.1	4.31 "	24	7.92	"	"	"
25	7.03	"	"	"	25	8.59	9"×13.4 C	10.5	5.02 "
26	7.61	"	"	"	26	9.30	"	"	"

For purlin table where the deflection is restricted, and for other loads, write us.



Roof on Sky Top Lodge, Canadensis, Pa.
ROSSITER, MULLER, MORTIMER & FOSTER, Architects

Porete for Steep Roofs, Used As a Base for Slate, Tile or Metal Roofing—Where slate, tile or metal roofing has to be nailed up, the Porete Slabs are covered with ½ in. of Porete Nail Finish. This is a mixture of portland cement and sand with a fibrous fireproof mineral material. This finish forms a tough resilient sheet which becomes integral with the Porete, greatly adding to its initial strength.



2 Ft. 8-In. Span, Channel I-Beams or Lightweight Joist Purlins—Porete Roof Slabs, 24x32x1¼ ins. thick, are laid on steel purlins at 2 ft. 8-in. centers and are fastened to them with heavy metal clips. After all the slabs are laid, a thin cement grout is worked into the rough surface and this roof deck is then ready for the waterproofing which is ordinarily a tar and felt roof.

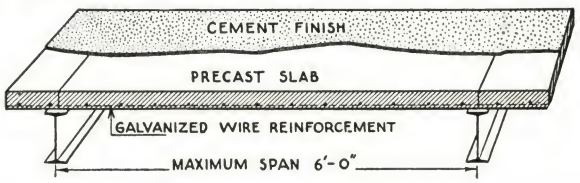
2 Ft. 9-In. Span, Tee Iron Purlins—Precast slabs are laid into the tees and fastened to them with steel wedges. Nailing Concrete is then applied flush with the top of the tees.

Roofs exposed to strong winds and the elements at great heights demand a roof deck to which tile, slate, copper or lead roofing can be nailed with safety and with perfect assurance that the tile and slate will not be blown off.

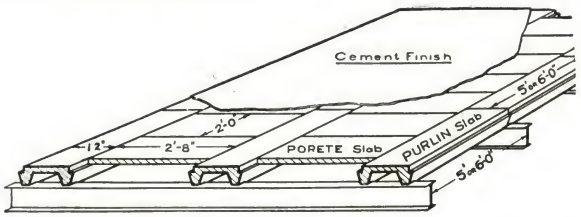
This method makes for a positive construction which has been used on many of the most prominent tower roofs.

Porete Roof Decks—Long Span

Flat Slab Construction—Consists of 4 to 6-ft. long precast slabs provided with a finish coat in the field. Thickness of roof 2⅛ to 3 ins.; weight 11 to 16 lbs. per sq. ft.

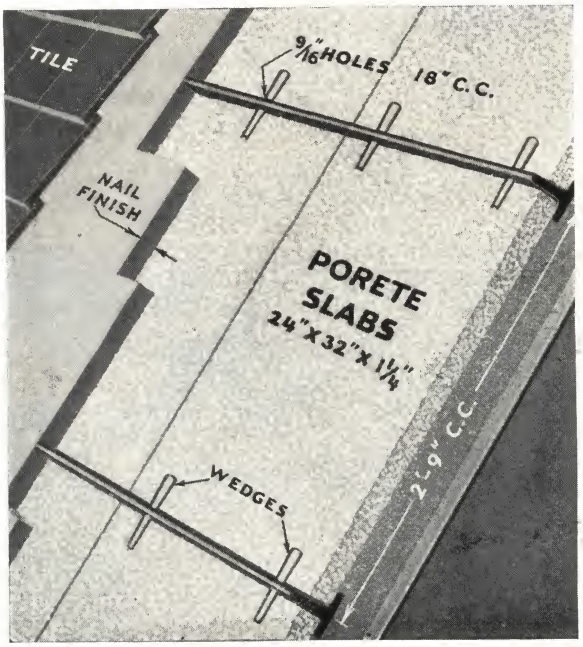


Purlin Slab Construction—This is a combination of a 5 to 6-ft. long channel slab and the 2 ft. 8-in. span Porete Slab. This roof is 1½ ins. thick and weighs 12 to 15 lbs. per sq. ft.



For Longer Spans Up to 10 Ft.—We erect subpurlins on 2 ft. 8-in. centers—either channels, I-beams, rail or other sections bolted or welded to the main beams as a support for the 2 ft. 8-in. slabs.

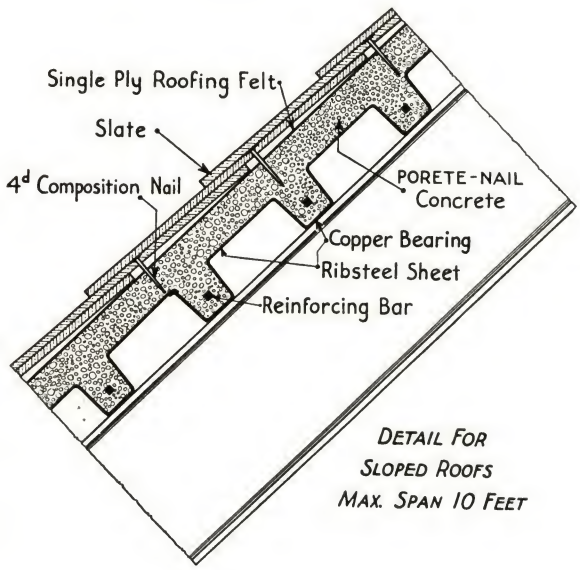
Porete Roof Installations
(Left) Hotel Savoy-Plaza, New York, N. Y.
McKim, Mead & White, Architects
(Center) Sherry-Netherlands, New York, N. Y.
Schultze & Weaver, Architects
(Right) Hotel Pierre, New York, N. Y.
Schultze & Weaver, New York, N. Y.



On Very Steep Roofs Porete Slabs Are Laid in Tee Irons and Held Down with Steel Wedges

Cross Section Rib Steel Roof

Applying Concrete on Rib Steel Sheets



Applying Nail-finish on Rib Steel Sheets

Rib Steel Roofs

Porete Rib Steel Roofs are constructed of ribbed, copper-bearing steel sheets, 20 to 24-gauge, covered with a layer of solid concrete or lightweight nailable, insulating concrete. The ribs formed in the steel sheets are designed as individual beams capable of sustaining the required loading of 40 to 120 lbs. per sq. ft. depending on the width of the span, as shown in the table on bottom of this page. The ribs are 1½ ins. deep on standard and 2 ins. deep on super sheets, and are spaced 6 ins. on centers.

These rust-resisting sheets are laid on structural steel purlins and securely fastened to the same with clips. After the sheets have been laid, they are covered with concrete. On flat roofs, the usual application is 1 in. of cement grout; on sloped roofs 1½ ins. of nailing concrete suitable for the nailing of slate, tile or metal roofing. The ribs are reinforced with independent steel bars or with heavy sheet metal "Z" bars welded to the bottom of each corrugation. The sheets are painted in the shop with either black asphaltum or a light colored paint. On flat roofs where high heat insulation is required, we can cover the sheets with a lightweight Porete of 32 lbs. per cu. ft. On sloped roofs the slate or tile can be nailed up directly to the Rib Steel roof-deck.

Advantages of Rib Steel Roofs—They are suitable for long spans up to 10 ft. with a light weight of only 9 to 16 lbs. per square foot depending on the span. They are permanent as concrete roofs and much lower in cost, particularly on sloped roofs. They can be erected in one-half the time of other fireproof roofs. They provide good heat insulation and present an attractive looking ceiling underneath.

Rib Steel Floors

The same construction is used for floors. We recommend it for buildings where the steel is not fireproofed and with spans up to 6 ft.—floor loads of 150 lbs. per sq. ft. for a 4-ft. span, and 100 lbs. per sq. ft. for the 6-ft. span. This makes a strong and light floor easily and quickly erected for mezzanine floors, warehouses, etc.

RECOMMENDED CONSTRUCTION SPECIFICATIONS FOR GIVEN SPAN OF RIB STEEL ROOFS AND FLOORS

Span, in feet	4	6	8	10	12
Gauge	24	24	22	22	20
Corrugations, ins. deep	1½	1½	1½	2	2
Safe live load, lbs. per sq. ft. with 1-in. solid cement finish (dead load 15-20 lbs. per sq. ft.)	120	90	65	55	45
Safe live load, lbs. per sq. ft. with 1½-in. light weight nailable concrete finish (dead load 9-15 lbs. per sq. ft.)	120	75	50	.....	.....

PORETE FILL (CAST IN SITU)

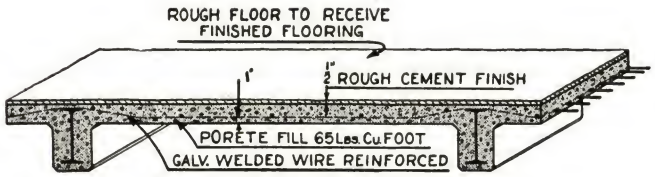
Porete Fill (cast in situ) is a light weight aerated portland cement fill poured on the job. This material requires a special mixer in which a foam is beaten up and mixed with portland cement and fine sand. The result is a foamy, aerated, jellylike slurry of bubblestone which, after it is poured on the job, sets the same as concrete.

This method is essentially different from others in use and gives a positive uniform and true aeration of the concrete. The weight of the wet mixture is checked continuously on a scale. The weight per cubic foot of the final material, or in other words the porosity, is predetermined.

This light weight fill is not made to hold nails. For Nail-Fill ask for our special circular.

This Floor-fill is usually applied by our own men. Where preferred we supply the mixer operated by our own mechanic and the necessary materials.

This Floor-fill can be made in any weight from 19 to 90 lbs. per cu. ft. We recommend the weights shown below:



Beams on 4-ft. to 8-ft. Close Centers

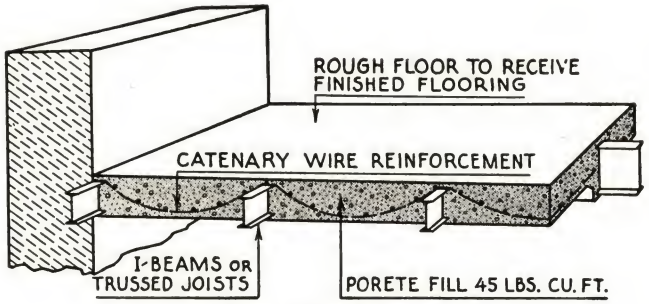
For Structural Floors—

65 Lbs. per Cu. Ft.—We recommend a weight of 65 lbs. per cu. ft. on a floor slab which is similar to the standard cinder concrete floor slab construction, with the exception that instead of using cinder concrete, a structural lightweight Porete is used with a weight of of 65 lbs. per cu. ft. for the main fill, and a rough ½-in. cement finish on top of this fill. This top finish takes care of the compressive stresses which are produced by the bending moment. Tests have proved that this construction is as strong as the standard cinder concrete floor arch. The advantages are a saving of about 12 lbs. per sq. ft. of dead load over cinder concrete.

It is to be considered that the fireproofing of all the beams and girders is also done with this lightweight material. The lightweight Porete Fill is much better than cinder concrete because it will prevent rusting of the reinforcing steel, the wire reinforcement and the pipes and conduits which are embedded in the slab. This makes a good sound insulating floor which will prevent the transmission of noises from one floor to another.

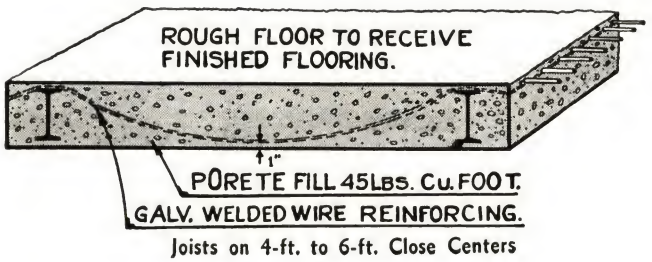
We recommend this floor system particularly where a saving in dead load is important—also where a better material than cinder concrete is desired. There are many cases in which steel embedded in the cinder concrete has been completely corroded by the presence of sulphur and moisture in the cinder concrete.

45 Lbs. per Cu. Ft.—We recommend a weight of 45 lbs. per cu. ft. on a floor system which consists of steel beams with the wire reinforcement suspended on the catenary principle. The lightweight concrete is poured to a depth of 1½ ins. below the bottom of the beams and flush with the top. The weight of the floor is 4 lbs. per sq. ft., 1 in. thick.



Joists on Close Centers

(a) The beams which can be standard rolled beams, J&L Junior beams, or trussed joists, are set close together—say about 24 to 30 ins. on centers.

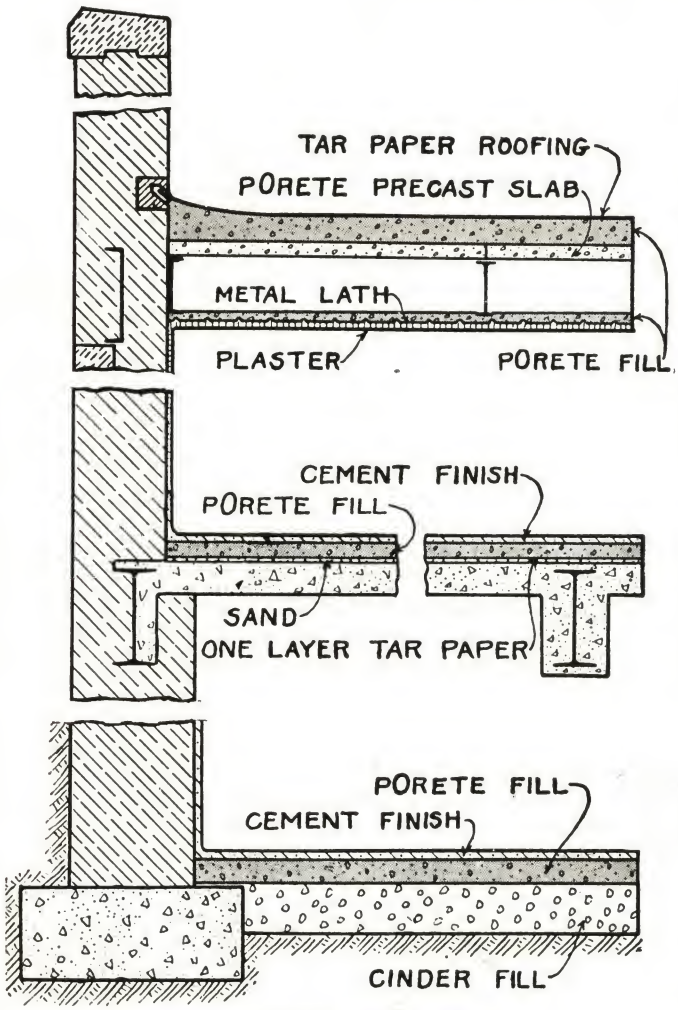


Joists on 4-ft. to 6-ft. Close Centers

(b) The beams are set 4 to 6 ft. apart. The minimum thickness is 8 in. with a weight of 37 lbs. per sq. ft., good for a live load of 75 lbs. per sq. ft.

These floors have a flat ceiling with a first class bond for plastering. They provide unsurpassed sound insulating value.

PORETE FILL (CAST IN SITU)—Continued



Cross-section Showing Different Uses of Fill

For Floor Fill—

As a floor fill on top of structural concrete floors, we recommend a weight of 45 lbs. per cu. ft.

The purpose of this fill is to provide: an insulation against heat and sound; a medium in the space where conduits, pipes and sleepers are placed and a support for the floor finish.

There is an increasing demand for Porete Fill particularly where pipes and conduits have to be embedded. It eliminates rapid deterioration of the pipes through dampness. The Porete Fill insures an ideal material for the embedding of such pipes.

For heat and sound insulation, particularly in hospitals, apartments and hotels where the transmission of noise from one floor to another is objectionable, Porete Fill is unsurpassed. Its cleanliness, fireproofness and permanency make it particularly desirable in this class of buildings.

For Insulating Fill on Roofs—

Weight 30 to 35 lbs. per cu. ft. Compressive strength approximately 150 to 200 lbs. per sq. in. 2.6 in. of this fill are equal to a 1 in. thickness of cork.

For Insulating Steam Pipes and Refrigeration Lines—

Approximately 19 lbs. per cu. ft. Compressive strength approximately 40 lbs. per sq. in.

A FEW REPRESENTATIVE PORETE INSTALLATIONS AND THEIR ARCHITECTS

Hospitals

Miriam Osborne Home, Harrison, N. Y., Crow, Lewis & Wick
Hospital Buildings, Asyla, N. J., Walter W. Sharpley
Community Hospital, Glen Cove, N. Y., Peabody & Brown
Crawford-Allen Memorial Hospital, North Kingston, R. I., York & Sawyer
Soho Hospital, Belleville, N. J., Sutton & Sutton
State Hospital, Hillsdale, N. J., Guilbert & Betelle

Schools, Churches, etc.

Andover Academy, Andover, Mass., Chas. A. Platt
Yale University, New Haven, Conn., James Gamble Rogers
Princeton University Chapel, Princeton, N. J., Cram & Ferguson
Irving Auditorium, Philadelphia, Pa., Horace Trumbauer
St. Mary's Church, Jersey City, N. J., Robt. J. Reiley
Duke University, Durham, N. C., Horace Trumbauer
St. Nicholas Church, New York, N. Y., O'Connor, Delany & Schultz
Penn State College, State College, Pa., Chas. Z. Kaluder
Lehigh University, Bethlehem, Pa., Vischer & Burley
Nyack High School, Nyack, N. Y., Ernest Sibley
English Lutheran Church, Brooklyn, N. Y., Bertram Grosvenor Goodhue Associates
Art Museum, Montclair, N. J., Goodwillie & Moran
Adelphi College, Garden City, N. Y., McKim, Mead & White
Cathedral, Altoona, Pa., Geo. I. Lovatt
Universalist Memorial Church, Washington, D. C., Allen & Collens
2 Schools, Scarsdale, N. Y., Rossiter & Muller
National City Christ Church, Washington, D. C., John Russell Pope
State Capitol, Charleston, W. Va., Cass Gilbert

Theaters, Hotels, Banks, Office Buildings and Residences

Strand Theater, Atlantic City, N. J., Hoffman-Henon Co.
Theater, Worcester, Mass., Thomas W. Lamb
Berkshire Theater, Brooklyn, N. Y., Harrison G. Wiseman
Essex County Trust Co., East Orange, N. J., Dennison & Hirons
New Netherlands Hotel, New York, N. Y., Schultze & Weaver
Waldorf-Astoria Hotel, New York, N. Y., Schultze & Weaver
Sky Top Lodge, Canadensis, Pa., Rossiter, Muller, Mortimer & Forester
F. A. Godley Residence, Plandome, L. I., N. Y.
New York Life Insurance Co. Building, New York, N. Y., Cass Gilbert
Horace Bushnell Memorial, Hartford, Conn., Helmle & Corbett
H. E. DuPont Residence, Winterthur, Del., A. E. Ives
Stillman-Rockefeller Residence, Greenwich, Conn., Noel & Miller

Industrial Buildings, Power Plants and Garages

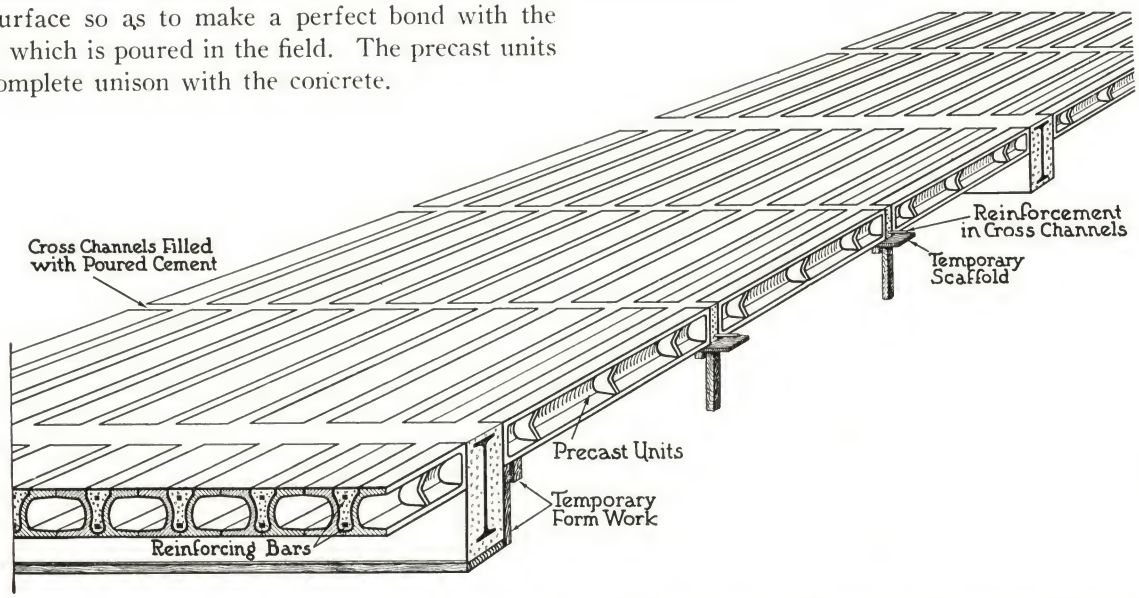
Power Plants, Atlantic City, N. J., Scranton, Pa. and Rockford, Ill., American Gas & Electric Co., Engineers
Virginian Railway Power Plant, Narrows, Va., Gibbs & Hill
Radio Corporation of America, Skinner & Cook
Fulton Water Works, Fulton, N. J., Hazen & Whipple
Nazareth Cement Co., Nazareth, Pa., Ford, Bacon & Davis
Philadelphia & Reading Grain Elevator, Philadelphia, Pa., Fegles Construction Co.
Walker Gordon Milk Co., Plainsboro, N. J., Private Plans
Lawrence Portland Cement Co., Thomaston, Me., Burrell Engineering & Construction Co.

LONG SPAN PRECAST UNIT FLOOR SYSTEM

This is a one-way reinforced concrete slab with a flat ceiling consisting of reinforced concrete tee beams poured in place between 6-ft. long precast hollow concrete units.

The precast filler units are made of concrete with a rough surface so as to make a perfect bond with the concrete which is poured in the field. The precast units act in complete unison with the concrete.

The unusual length of 6 ft. for the precast units is the cause for the possibility of quicker erection with less labor and for a minimum of temporary framing and shoring not possible with other systems of floor construction.



The Porete Long Span System is based on standard reinforced concrete practice. The carrying capacity and the stresses can be figured the same as those of any other long span construction. The greater strength of the concrete with the factory-made units—as well as the higher grade concrete used in the pouring of the floors by the PORETE MFG. COMPANY—allows higher stresses in this floor system where this is permissible.

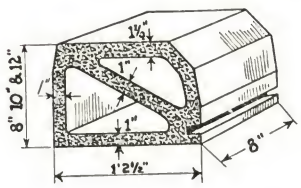
This floor system, without a cement finish on top, is good for 75 lbs. per sq. ft. live load for spans up to 20 ft. and correspondingly higher loads on shorter spans. With a 2-in. cement finish, it can be used for the same loading up to 26 ft.

For accurate data on the design for different spans, loads and conditions, please write to the main office, or to our nearest representative.

SHORT SPAN PRECAST UNIT FLOOR SYSTEM

This floor system is designed to fit J&L Junior beams, Bethlehem joists and also trussed joists having straight continuous bottom flanges.

It consists of short precast units, put up between the joists, which joists have to be set on 30-in. centers. The blocks are held up by a temporary scaffold.

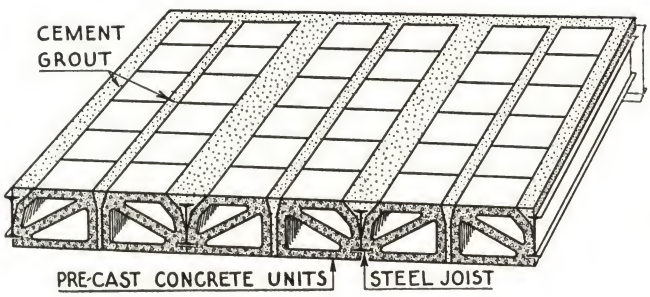


Cement grout is then poured between the units and also around the webs and top flanges of the beams.

The blocks are made in three sizes—8, 10, and 12 ins. deep.

This precast concrete floor system meets the requirements of different building codes for first class fireproof construction.

All beams and girders are encased in the regulation thickness of concrete.



Note

Both these floor systems have a flat beamless ceiling underneath. This reduces the height of the building for the same effective headroom; better lighting and ventilation is obtainable. The rough surface on the underside provides a good plaster bond. For warehouses where no plastering is required, the underside of this floor furnishes in itself a light and attractive ceiling.

The precast units are made under rigid factory control in automatic machines—every one alike and all of high quality concrete cured under ideal conditions for the right length of time.

WATERPROOFING, DAMPPROOFING AND CONCRETE TREATMENTS

ADENSITE CO., INC.

Manufacturers of Concrete Waterproofings and Hardeners

152 West 42nd Street
NEW YORK, N. Y.

LABORATORY: 36-17 34th Street, LONG ISLAND CITY, N. Y.

Products

ADENSITE, a Liquid Integral which is used in the gauging water for Hardening and Waterproofing portland cement concrete and mortar.

PURTONE COLORS, mineral color in powder form for portland cement floor finish.

ADAFLINT, a flush-on floor hardener in crystal form.

CLERSEAL, a colorless waterproofer.

A LIQUID INTEGRAL ADENSITE ITS FUNCTION GUARANTEED

TRADE-MARK

Adensite

Uses—Waterproofing concrete walls below grade, either in mass concrete or in plaster coat.

Hardening and dustproofing cement floor finish.

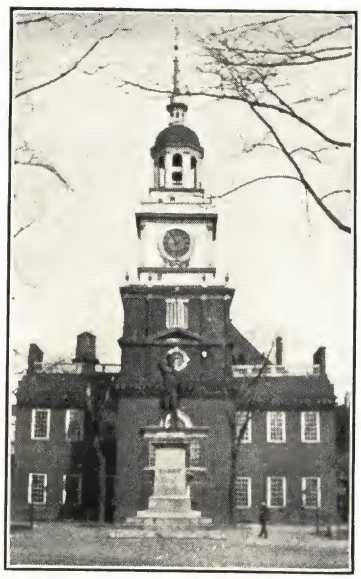
Waterproofing portland cement stucco.

For brick masonry, Adensite gauged mortar is smooth working, does not drag and prevents "riding."

Authoritative Tests—Upon request, we shall be pleased to furnish the architect with authoritative test data on Adensite, compiled from testing laboratory results and research work carried out at the U. S. Bureau of Standards for the A. S. T. M.

Guarantee—Adensite is unconditionally guaranteed to produce positive and permanent results by the manufacturers, the ADENSITE CO., INC. Surety maintenance bonds furnished on waterproofing jobs.

Service—Our field men visit construction operations while Adensite is in use.



Independence Hall, Philadelphia
Waterproofed with Adensite gauged plaster coat

Colored Floors

PurTone colors are specially prepared for use with portland cement in floor finish and are used integrally throughout entire top finish, assuring permanent and positive results. Specifications on request.

Applied Hardener

Adaflint, dissolved in water, 2 lb. to the gallon and slushed over an old or new floor, will render a cement finish hard and dustless. Furnished in natural gray, oak and green.

Colorless Waterproofing for Masonry above Grade

Clerseal can be applied with brush or spray. One gallon is sufficient for two applications for 80 to 100 sq. ft. of surface.

Shipments

Adensite is shipped in 5, 30 and 50-gal. containers.
PurTone Color is shipped in 550-lb. barrels.
Adaflint is shipped in 2-lb. boxes, 25 to a case.
Clerseal is shipped in 1-gal. jugs; 5, 30 and 50-gal. barrels.

Adensite Specifications

Waterproofing Mass Concrete—The gauging liquid for concrete shall be prepared by placing from 3 to 4 gal. of Adensite in a 52-gal. barrel and adding water. For every 1-bag batch, use between 3 and 4 gal. of the prepared liquid (amount of liquid varies with fineness of aggregate and temperature).

Joints Between Pourings—Shall be thoroughly grouted with Adensite grout.

Waterproof Plaster Coatings—Shall be 5/8 in. in thickness, applied in 2 coats and properly coved and bonded to the floor.

Bonding New to Old Concrete—All surfaces before application of new work shall be thoroughly roughed, cleaned and dampened with Adensite grout to insure perfect bond.

Adensite Grout—Add 1 part Adensite to 3 parts water and enough cement to give mixture a creamy consistency.

Protection of Green Work—To protect green work against action of water, the pump shall be kept in operation 24 hours after pouring or troweling of work.

Floor Hardening—Upon the plain concrete floor slab shall be laid a 1-in. topping of 1 part cement and 2 parts clean sand.

This dry mix shall be tempered with a liquid composed of 3 gal. of water to 1 qt. of Adensite for every 1-bag batch. No dryer shall be used.

Gauging Liquid for Floor Finish—Gauging liquid may be prepared by putting 4 gal. of Adensite into a 52-gal. barrel and adding water (no stirring required).

Bond—When slab is over 48 hours old, before topping is stretched, it shall be given a coating of Adensite grout.

When slab is over 7 days old, before topping is stretched, it shall be roughed with a pick or chisel, cleaned and given a coat of Adensite grout.

Brick Masonry—The mortar shall be composed of 1 part portland cement, and 3 parts clean sand, tempered with a liquid composed of 1 part Adensite to 12 parts water.

Some Users of Adensite

Grosvenor Atterbury, New York, N. Y.
Alfred C. Bossom, New York, N. Y.
Harold B. Brady, Elizabeth, N. J.
Bureau of Yards & Docks, Washington, D. C.
Clinton & Russell, New York, N. Y.
George W. Conable, New York, N. Y.
Day & Klauder, Philadelphia, Pa.
Delano & Aldrich, New York, N. Y.
Dennison & Hirons, New York, N. Y.
I. E. Ditmars, New York, N. Y.
C. E. C. Dyson, Toronto, Ont., Canada
J. H. & W. C. Ely, Newark, N. J.
J. W. Ferguson Co., Paterson, N. J.
Fletcher-Thompson Co., Inc., Bridgeport, Conn.
D. R. Franklin, Toronto, Ont., Canada
John F. Jackson, New York, N. Y.
Mack & Sahm, Wilkes-Barre, Pa.
John Molitor, City Architect, Philadelphia, Pa.
New York Central Railroad Co., New York, N. Y.
John T. Rowland, Jr., Jersey City, N. J.
F. B. & A. Ware, New York, N. Y.
Warren & Wetmore, New York, N. Y.
F. W. Wentworth, Paterson, N. J.

ESTABLISHED 1895

THE ANTIHYDRINE COMPANY

294 Kimberly Avenue

NEW HAVEN, CONN.

Product

Manufacturers of ANTIHYDRINE, a Coating for Dampproofing and Stainproofing.

Description

Antihydrine is a material made of a high grade of asphalt carefully prepared in combination with several chemicals, which combination gives it the peculiar property of *forming (without heating) a continuous glossy and impervious coating upon porous surfaces, without penetration.*

Antihydrine is the pioneer dampproof paint, having been first made in 1895. *There has been no subsequent change in formula.*

Advantageous Features

(1) Antihydrine eliminates the necessity of using lath and wood furring for interior plastering of outside walls, plastering being applied over the Antihydrine within 24 hours.

(2) Renders walls dampproof.

(3) Prevents staining of plastering on walls and on fireproof work; also, the following:

Applied to Inside of Outside Walls—(4) No furring needed—cost of and space occupied by furring are saved.

(5) Dangerous places to harbor vermin and encourage fires (when wood furring is used) are eliminated.

(6) Outside walls are made absolutely dampproof.

(7) Building is made warmer and more easily heated.

(8) All staining of and efflorescences on plastering are avoided.

Applied to Fireproof Blocks in Ceilings and Partitions—(9) All staining and efflorescence prevented.

(10) Plastering on blocks dries quickly, saving much time.

(11) All plastered surfaces permit diversified decoration without danger of damages from dampness.

(12) Discoloration of plastering from smoky brick is prevented.

Applied to Built-in Surfaces of Iron, Limestone, Marble, Face Brick, etc.—(13) All ironwork built in wall is preserved.

(14) Staining and efflorescence on exterior of limestone, marble and brick are prevented.

(15) Use of *ordinary* cement mortar in the backing is allowed, thus saving time and money otherwise spent in preparation of expensive cement mortar.

Application

After being well stirred, the Antihydrine contents are poured into a pail and any laborer can apply same *cold* with a brush. Material is fully prepared, ready for use, and is applied as easily as whitewash; *the coating, however, must be kept absolutely continuous, covering every part.* A second coat can be applied, if desirable, within a few hours after the first application.

Covering Capacity

Extensive, by reason of its lack of penetration. One gallon covers about 100 sq. ft. of brickwork or fireproofing, one coat; or, 60 sq. ft., two coats; one coat, properly applied, is sufficient for the prevention of dampness and stains.

Shipment

Antihydrine is delivered in casks of 10 and 50 gallons.

Cost

The cost of Antihydrine is $1.25 per gallon.

Specification Data

The brush shall be the kind used for oiling brick fronts; contents of barrel to be thoroughly stirred before application; every part to be covered, leaving no small holes, etc.; coating to be thin where it is to be plastered over, with sufficient body to leave a glossy surface; and the Antihydrine to be soft or "tacky" when plastering is applied.

First coat of plastering, as thin as will allow of proper scratching, will dry quickly; second coat is applied immediately thereafter; after drying, third and last coat of plastering is applied when, after a few days, surface will be ready for painting and decorating.

References

A few buildings in which Antihydrine was used:

New York, N. Y.

American Museum of Natural History
Delmonico Building
St. James Building
Manhattan Hotel
Skin and Cancer Hospital
Home for Aged Men and Married Couples
Journeay Building
Public School Buildings
New York Hospital
New Hall of Board of Education
Commercial Academy of Marest Bros.
Clara Hirsch Home for Working Girls

Other Cities

Lincoln Memorial, Washington, D. C.
St. John's Home for Boys, Brooklyn, N. Y.
Brazer Building, Boston, Mass., Cass Gilbert, Architect
Masonic Temple, Boston, Mass., Loring & Phipps, Architects
Residence, Beacon St., Boston, Mass., R. Clipston Sturgis, Architect
Hotel Dartmouth, Boston, Mass., Maginnis, Walsh & Sullivan, Architects
St. Joseph's Novitiate, Boston, Mass., Maginnis, Walsh & Sullivan, Architects
Hotel Cambridge, Boston, Mass., W. T. Sears, Architect
Hall of Missions Church, Boston, Mass., T. J. Untersee, Architect

ANTI-HYDRO WATERPROOFING CO.

TELEPHONE
Terrace 3-5440

295 Badger Avenue
NEWARK, N. J.

ESTABLISHED 1904

REPRESENTATIVES, SERVICE AND STOCK IN ALL LARGE CITIES

Products and Services

"ANTI-HYDRO PERMANENT," a Liquid Integral Compound for waterproofing, dampproofing, accelerating without weakening, and for hardening all portland cement mixtures; producing durable concrete.

ARMORTOP, a liquid applied Hardener and Dust Preventer for cement floor surfaces.

AMURSEAL, a black liquid dampproofing applied to exterior foundation walls and footings.

ARIDTITE, a black liquid dampproofing and bond coat for plastering walls above grade.

ACCELLO, a water solution of commercially pure calcium chloride for refrigeration and for accelerating the set of concrete in cold weather, without freezing.

CONSULTING WATERPROOFING ENGINEERS, for consultation and design for all waterproof constructions. Correspondence invited.

25-Year Guarantee

On many important installations we have furnished a written guarantee for 25 years on the maintenance of waterproof concrete. A Surety Bond will be furnished on all waterproofing installations supervised by our Engineering Department. Written guarantee for 5 years furnished on dustproofing and hardening of concrete floors.

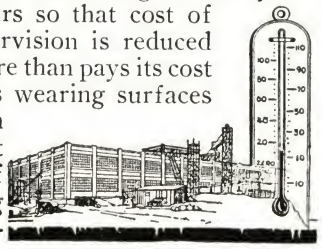
"Anti-Hydro" Concrete Integral Waterproofer and Hardener

ANTI-HYDRO
FOR PERMANENT CONCRETE
HARDENS WATERPROOFS
TRADE-MARK

Description — "Anti-Hydro" is a liquid compound, with an affinity for cement. When added, in certain percentage to the water used in gauging portland cement mixtures in the usual way, it has the effect, without retarding setting, of rendering cement in all kinds of masonry impervious to water, moisture, frost, gas, oils, odors, sugar solutions, alkalis and most acids. It excites and brings into service all the cohesive or colloidal possibilities of portland cements, which in themselves are most efficient waterproofing mediums. There are no alums, hydrate of lime, greases, oils, stearic acid, iron admixtures or decomposable ingredients of any kind used.

Hardens and Dustproofs Concrete Floors

"Anti-Hydro's" function may be expressed as waterproofing cement with cement; that is, filling the voids with a cement solution, which crystallizes at the same time as the cement, integrally forming a hard, insoluble silicate of greater tensile strength, density and activity. It enriches mortars so that cost of troweling, mixing and supervision is reduced to a minimum. In fact, it more than pays its cost in labor saving. It hardens wearing surfaces to a degree that makes them dustless and adamant. It lowers the freezing point of the gauging water, permitting concreting when the temperature is as low as 15° F.



Lowers Freezing Point

When mixed with portland cement "Anti-Hydro" forms a plastic mass which sets up very quickly and is used for calking metal passing through concrete, and for stopping leaks under pressure. Mixed with water and cement, it forms a dampproof paint which can be applied to the inside of masonry walls or to the back of limestone to prevent discoloration.

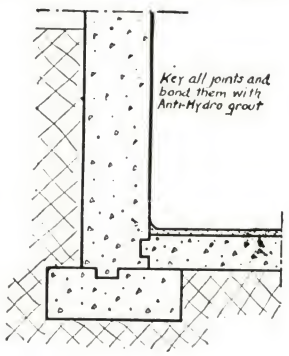
Dampproofs Brick Mortar and Reduces Efflorescence

"Anti-Hydro" is used for hardening cement floors, waterproofing concrete in mass and in surface coating, and bonding topping to underlying slab; dampproofing and waterproofing brick mortar and for reducing efflorescence; waterproofing, hardening and bonding concrete roads.

Tests—Reports of comparative tests made at the following laboratories are available: California Institute of Technology; Case School of Applied Science; Columbia University; E. L. Conwell & Co.; Georgia School of Technology; David Kinkaldy Labr., London, Eng.; H. C. Nutting Co.; Pittsburgh Testing Laboratories; U. S. Bureau of Standards; University of Michigan.

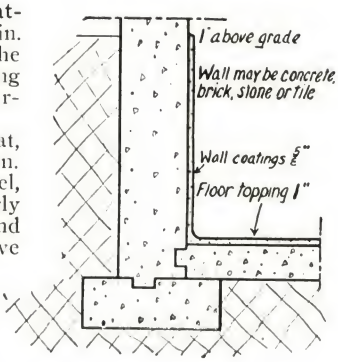
Specifications

Waterproofing in Mass—To the 1:2:4 mix, for gauging, add 1½ gal. of "Anti-Hydro" for every cubic yard of concrete. Proper consistency will be obtained if, for each bag of cement, 1 qt. of "Anti-Hydro" be added immediately after the water, and not over 5½ gal of water be used per bag of cement. If forms are below water level, concrete should be poured stiff. Unless walls and floor are poured at one time, key all joints and bond them with "Anti-Hydro" grout. (See bonding directions below.)



Floor Hardener—The 1-in. floor topping of 1:2 mix shall be gauged by addition of "Anti-Hydro" to all water used in tempering dry mixture, using 1 gal. of "Anti-Hydro" to each barrel (4 bags) of cement. Proper consistency will be obtained if, for each bag of cement, 1 qt. of "Anti-Hydro" be added immediately after the water, and not over 3½ gal. of water be used per bag of cement. (See bonding directions below.)

Waterproofing in Coatings—Floor work shall be 1 in. in thickness, and shall serve the double purpose of waterproofing agent and dustless wearing surface.



Wall coatings (2-coat, scratch and finish) shall be ⅝ in. in thickness from floor level, where they shall be properly coved and bonded to floor, and carried up to at least 1 ft. above grade.

The 1:2 mortar shall be gauged by addition of "Anti-Hydro" to all water in proportion of 1 gal. "Anti-Hydro" to each barrel (4 bags) cement.

Perfect Bond—To assure perfect bond to underlying masonry, all surfaces, before application of waterproofing, shall be thoroughly roughened, cleaned, dampened and grouted.

A slush or grout of neat cement, using 1 part "Anti-Hydro" to 3 parts of water, is first applied. Coatings shall be applied not later than 24 hours after surfaces have been prepared and while slush coat is still wet.

Note: Specifications for waterproofing *Brickwork, Cast Stone, Stucco on Solid Masonry* and *Stucco on Metal Lath and Dampproofing* furnished on request.

Acid Resisting—Write for special specifications.

Road Work—"Anti-Hydro" is especially suited for concrete pavements and roads. It makes concrete as hard in 24 hours as it would ordinarily be in 8 days and actually increases the strength of concrete 22%. Due to its quick hardening qualities, roads are made ready for use in 24 hours after they are laid by mixing 1 gal. of "Anti-Hydro" to 10 gal. of water.

"Anti-Hydro" can be used with any portland cement at a minimum cost.

For maintenance work, "Anti-Hydro" will bond new concrete securely to old.

"ANTI-HYDRO" QUANTITIES

Kind of work	Quantity Anti-Hydro per bbl. cement	Covering capacity
Waterproofing in mass 1:2:4 concrete	1 gal.	2/3 cu. yd. concrete
Waterproofing 5/8-in. plaster coat	1 gal.	100 to 125 sq. ft.
Waterproofing 1-in. floor topping	1 gal.	100 to 80 sq. ft.
Waterproofing stucco 7/8 in.	1 gal.	100 sq. ft.
Waterproofing brickwork 3/8-in. joint	1 gal.	700 brick or 35 cu. ft.
Dampproofing brickwork 3/8-in. joint	1 gal.	1000 brick or 50 cu. ft.
Dampproofing in cement wash	8 gal.	2400 sq. ft.—2 coats
Hardening cement floor 1-in. topping	1 gal.	100 to 80 sq. ft.

Armortop Concrete Applied Dustproofer and Hardener

Description—Armortop is a liquid compound which, when applied to any concrete surface, old or new, changes the soft granular topping of the concrete into a granitelike mass that resists the most severe wear and abrasion without dusting up. The application of Armortop insures added years of wear and use for any cement floor whether it has just been laid or whether it has been in service for several years. It saves tearing up and relaying old floors which are beginning to rut.

ARMORTOP
THE APPLIED HARDENER FOR CONCRETE
TRADE-MARK

So easily, quickly and surely does Armortop transform soft, crumbling, dusting floors into new, hard, dustproof ones, that the whole job can be performed in the evening after closing hours by any ordinary laborer. Next morning floors are ready for use without loss of time, costly shutdowns and delays to manufacturing.

No skill is required to apply Armortop. Simply mix it with water and brush it with a stiff brush or broom over the surface to be treated.

Armortop reacts chemically with cement and combines with it, forming a new compound which binds the loose, disintegrating particles of the concrete mix into a dense hard mass. Because of this reaction, Armortop results are permanent and should not be confused with temporary paint coatings.

The covering capacity of Armortop varies with the density of the floor. One gallon will cover from 70 to 150 sq. ft. of floor surface.

A concrete test slab treated with Armortop will be sent to any one desiring to make the comparative test.

Specifications—Upon the clean, dry floor apply a solution of 1 part Armortop and 1 part water in 2 or more coats, depending upon the density of the floor. Allow 4 hours to elapse between coats.

Amurseal Dampproofing

Amurseal, a black liquid dampproofing, may be applied cold with spray or brush to the exterior of foundation walls. Two coats give a solid elastic film, impenetrable to dampness, and unaffected by expansion or contraction of the walls.

AMURSEAL
THE FOUNDATION DAMPPROOFING
TRADE-MARK

Aridtite Dampproofing and Plaster Bond

A black liquid dampproofing and plaster bond applied cold to the inside surface of exterior walls in a single coat. Aridtite provides a perfect bond for plaster and assures a lasting job. It prevents moisture passing through the walls and thus eliminates plaster stains and discolorations. Also used for coating unexposed sides of cut stone.

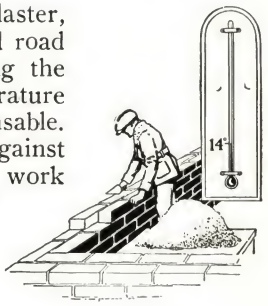
ARIDTITE
THE DAMPPROOF PLASTERBOND
TRADE-MARK

Accello Concrete Accelerator and Anti-Freeze

Description — Accello, a liquid solution, is used to accelerate the set of cement mortars and floor finish in very cold weather, and to make possible the hydration of portland cement mixtures at temperatures as low as 14° F.

ACCELLO
For Accelerating the Set of Cement
TRADE-MARK

In plain concrete, cement plaster, floor toppings, brick mortar, and road work, the use of Accello during the winter months, when the temperature falls as low as 14° F., is indispensable. It insures masonry work against frost and freezing, and permits work to continue during the cold weather.



Accello makes bricklaying and road work possible until the temperature drops below the point at which it pays to keep the men at work.

Accello is a standardized solution of calcium chloride, uniform in quality and strength. It is easy to use. Any unskilled workman can add it to the gauging water. The proportions necessary are shown below:

Proportions of Accello and Water at Outside Air Temperatures—

35° F., use 1 part Accello with 20 parts water
32° F., use 1 part Accello with 15 parts water
28° F., use 1 part Accello with 12 parts water
25° F. (or less), use 1 part Accello with 10 parts water
14° F. (or less), mechanical heat is necessary

Detailed Information

Write for complete data and specifications for any work within the scope of "Anti-Hydro" products. The services of our Engineers are available at all times.

Dealers Everywhere Carry Stock

A complete stock of "Anti-Hydro" products is carried by dealers throughout the country.

Shipment

"Anti-Hydro" is shipped in standard containers of 5, 10, 20 and 30 gal.

Armortop, in containers of 5, 30 and 50 gal.
Amurseal in drums of 5, 30 and 55 gal.
Aridtite in drums of 5, 30 and 55 gal.
Accello, in 50 gal. barrels and 5 gal. drums.

AQUABAR WATERPROOFING PRODUCTS, INC.

Waterproofings, Dampproofings, Floor Hardeners, Technical Paints and Steel Coatings—"Known the World Over"

GENERAL OFFICES
Perry Building, PHILADELPHIA, PA.
Representatives in all Principal Cities—Nearest Distributer's name furnished on request

Products

AQUABAR INTEGRAL COMPOUND NO. 1 WATERPROOFING PASTE.
AQUABAR AQUATITE INTEGRAL LIQUID WATERPROOFING.
AQUABAR CONCENTRATED INTEGRAL WATERPROOFING PASTE 1A.
AQUABAR CONCENTRATED INTEGRAL WATERPROOFING POWDER.
AQUABAR CLEAR-COAT NO. 2 COLORLESS WATERPROOFING LIQUID.
AQUABAR FERROCON METALLIC WATERPROOFING.
AQUABAR STATITE PLASTER BOND NO. 3 DAMPPROOFING PAINT.
AQUABAR MARINE CEMENT NO. 3A.
AQUABAR STONE BACKING NO. 3B.
AQUABAR MASTIC INSULITE CEMENT NO. 4.
AQUABAR SEMI-MASTIC.
AQUABAR EMULSIFIED ASPHALT
AQUABAR IRON-CLAD CRYSTALS NO. 7B FLOOR HARDENER.
AQUABAR DURO-MIX INTEGRAL LIQUID FLOOR HARDENER.
AQUABAR CRYSTEEL METALLIC FLOOR HARDENER NO. 7.
AQUABAR DUROCON SUPER-METALLIC FLOOR HARDENER.
AQUABAR QUICK SET CEMENT ACCELERATOR and ANTI-FREEZE COMPOUND.
AQUABAR WOOD FLOOR PRESERVATIVE.
AQUABAR CONCO CEMENT FLOOR PAINT.
AQUABAR CEMENT FLOOR FINISH and FILLER.
AQUABAR ELASTICOTE NO. 6 WATERPROOF PAINT.
AQUABAR MARINE WATERPROOF PAINT.
AQUABAR AQUATINT CEMENT PAINT.
AQUABAR ROOF COATING NO. 5.
AQUABAR STERILITE FLAT WAL-FINISH.
AQUABAR WAL-WITE ENAMEL (Mill White).
AQUABAR SANITARY ENAMEL.
AQUABAR FABRICATORS RED OXIDE.
AQUABAR CARBONITE STEEL COATING.
AQUABAR HOT SELF-SEALING FOUNDATION ASPHALT.
AQUABAR WATERPROOFING FABRIC or FELT.
AQUABAR AQUATEX CALKING COMPOUND.
AQUABAR ACIDPROOF PAINT.
AQUABAR HOT SURFACE PAINT.
AQUABAR EXPANSION JOINT FILLER.
AQUABAR BOILER COMPOUND.

Thirty Years of Quality and Service—1901-1931

For the past 30 years we have specialized in the manufacture of waterproofing and dampproofing materials, floor hardeners and protective coatings of all kinds.

As pioneers in solving the most difficult waterproofing problems, Aquabar has proven to be a most economical and efficient waterproofing compound. It is used extensively in the construction of swimming pools, reservoirs, vaults, foundations, tunnels and all other kinds of masonry construction.

Detailed architects' specifications and information on any of our products will be furnished upon request, without any obligation on your part.

Integral Waterproofings

No. 1 Integral Compound—A soft semipaste which is easily dissolved in water for waterproofing mass concrete, cement plaster, cement mortar for brick and stone work, stucco, etc. It does not affect the strength of concrete, but increases its effectiveness with age. Brick mortar waterproofed with Integral Compound No. 1 prevents efflorescence and discoloration on the brickwork.

Specifications for Waterproofing Mass Concrete—A dry mixture of cement, sand and stone—1:2:4 mix, shall be tempered to a medium wet consistency with water, to which 1 part of Aquabar Integral Compound No. 1 has been added to every 50 parts of water, in strict accordance with manufacturer's directions.

Machine Mix—Figuring on ½-gal. basis add ⅔ pt. to each bag of cement for mass concrete 1:2:4 mix.

Covering Capacity—From ½ to ⅔ gal. will waterproof 1 cu. yd. of mass concrete 1:2:4 mix.

Specifications for Waterproofing Cement Mortar and Stucco—The waterproofed cement mortar, consisting of 1 part cement, 2 parts sand with water, shall be prepared by tempering to required consistency, to which 1 part of Aquabar Integral Compound No. 1 has been added to every 25 parts water, in strict accordance with manufacturer's directions.

Covering Capacity—1 gal. will waterproof approximately 150 to 175 sq. ft. 1-in. top coat 1:2 mix cement mortar, or, approximately, 200 to 250 sq. ft. of cement stucco.

Aquatite Integral Liquid Waterproofing—A liquid compound for waterproofing and accelerating mass concrete and cement mortars. Prevents efflorescence on brickwork.

Specifications for Waterproofing Mass Concrete—To the 1:2:4 mixture for gauging add 1 gal. of Aquatite for every cubic yard of concrete. Proper consistency will be obtained if for each barrel of cement 1 gal. of Aquatite and from 10 to 15 gal. of water be used. If forms are below water level, an extremely stiff mixture should be poured.

Machine Mix—Figuring on 1 gal. basis add ⅔ qt. to each bag of cement for mass concrete 1:2:4 mix.

Covering Capacity—Use 1 gal. to every cu. yd. mass concrete 1:2:4 mix for ordinary moisture conditions. Where water pressure exists, use 1½ gal. per cu. yd.

Specifications for Waterproofing Cement Mortars—The 1:2 mortar shall be gauged by the addition of Aquatite to all water used in the proportion of 1 gal. of Aquatite to each barrel (4 bags) of cement.

Covering Capacity—1 gal. will waterproof 100 sq. ft. 1-in. top coat 1:2 mix cement mortar.

Concentrated Integral Waterproofing Paste 1A—A paste form of waterproofing for use in concrete and cement mixtures of all kinds. Especially adapted for use in colored stucco, mortar, etc.

Covering Capacity—Use 7 lbs. per cu. yd. of concrete 1:2:4 mix, or 8 lbs. to every 100 sq. ft. 1-in. top coat 1:2 mix.

Concentrated Integral Waterproofing Powder—A powder form waterproofing for use in mass concrete, cement mortar, stucco, etc.

Covering Capacity—Use 12 lbs. per cu. yd. mass concrete 1:2:4 mix, or 2 lbs. to each bag of cement for mortar, stucco, etc.

Dampproofings

Statite Plaster Bond No. 3—A black compound for application to masonry surfaces of all kinds, so as to form a dampproofing and bond for plaster. It eliminates furring and lathing.

Covering Capacity—Approximately, 75 sq. ft. per gal., 1 coat; 50 sq. ft. per gal., 2 coats.

Marine Cement No. 3A—A black compound of heavy consistency for dampproofing exterior foundation walls below grade, also for application to floor slabs of ground floors. Applied cold.

Covering Capacity—Approximately, 60 sq. ft. per gal., 1 coat; 40 sq. ft., 2 coats.

Stone Backing No. 3B—A black compound for dampproofing unexposed surfaces of cut stone and for rustproofing metal surfaces. It is applied just as it comes from the container.

Covering Capacity—Approximately, 125 sq. ft. per gal., 1 coat; 75 sq. ft., 2 coats.

Mastic Insulite Cement No. 4—A black mastic for waterproofing foundation walls, tunnels, etc., against heavy water pressure; for overcoating, calking and patching old roofs; sealing cracks, open joints, etc. Applied cold (with trowel) $\frac{1}{8}$ to $\frac{3}{16}$ in. thick according to the smoothness of the surface. When set, it has the consistency of hard rubber, never gets brittle and is unaffected by changes in temperature. Very elastic and adhesive; works freely.

Covering Capacity—Approximately, 25 to 30 sq. ft. per gal., 1 trowel coat.

Semi-Mastic—A heavy-bodied bituminous coating containing long staple asbestos fibre to produce a brush coating of definite thickness. For the dampproofing of masonry walls and floors above and below grade. (Can be used on all masonry surfaces but not concrete, nor can it be applied to ceilings.)

Covering Capacity—Approximately, 30 sq. ft. per gal. on corrugated hollow tile, 1 coat.

Emulsified Asphalt—Pure unadulterated asphalt scientifically emulsified so that it may be used cold and without heating when mixed with the aggregate for repairing cement floors, all roads and by itself as a bonding and waterproofing agent.

Covering Capacity—Approximately, 75 sq. ft. per gal., 1 coat; 50 sq. ft., 2 coats.

Floor Hardeners

Iron-Clad Crystals No. 7B (Surface Treatment)—These crystals are dissolved in water, and applied to the concrete surface with a stiff brush or broom in 2 coats of equal strength for wearproofing, waterproofing and dustproofing of same.

Covering Capacity—Approximately, 2½ lbs. will treat 100 sq. ft. of surface with 2 coats.

Duro-Mix Liquid Floor Hardener (Integral Method)—This liquid is added to the water used in mixing the cement top coat for wearproofing, waterproofing and dustproofing cement floors.

Covering Capacity—1 gal. will harden, approximately, 100 sq. ft. of 1-in. top coat, 1:2 mix cement mortar.

Pennsylvania R. R. Office Building, Philadelphia, Pa.
Graham, Anderson, Probst & White, Architects
Jas. Stewart Co., Contractors
Over one-half million square feet floors integrally hardened and dustproofed with Duro-Mix

Crysteel Metallic Hardener No. 7—Metallic particles that are mixed with the cement used for top coating. It forms a metallic crust that will withstand most severe traffic. Designed for factories, warehouses, etc.

Covering Capacity—Approximately, 30 lbs. mixed with 30 lbs. portland cement will treat 100 sq. ft. of surface dust coat.

Durocon Super-Metallic Floor Hardener—Specially prepared metallic hardener having the full retaining qualities of Crysteel with the addition of a newly perfected ingredient, Aquabar Ocon. The incorporation of Ocon with the metallic hardener provides a concrete of increased strength, thereby increasing its resistance to acid and alkali and other foreign elements. Ocon gives additional plasticity and workability to the floor topping, producing a superior, hard surface. Made in gray, red, green and brown.

Covering Capacity—Approximately 30 lbs. Durocon mixed with 30 lbs. portland cement will cover 100 sq. ft. surface, dust coat.

Floor Coatings

Wood Floor Preservative—A translucent liquid for preserving and dustproofing maple and yellow pine floors, without changing the appearance of the surface. It prevents rotting and decay, and adds to the wood those essential elements for preserving its life and appearance.

Covering Capacity—Approximately, 250 sq. ft. per gal., for 1 coat; 350 sq. ft. per gal. for 2 coats, depending upon the porosity.

Conco Cement Floor Paint—For coating cement floors above or below grade. It prevents dusting and disintegration of floors; is extremely durable, and resists wear to a remarkable degree.

Covering Capacity—Approximately, 250 sq. ft. per gal. for 1 coat; 150 sq. ft. per gal. for 2 coats.

Aquabar Cement Floor Finish—A penetrating liquid which, binding together the aggregate, produces a smooth, hard and dustproof amberlike surface. Excellent primer for paint.

Paint Products

Elasticote No. 6 Waterproof Paint—A highly specialized liquid cement coating for waterproofing and dampproofing exterior and interior concrete, brick, cement, stucco, plaster and masonry walls. Gives a handsome appearance and offers excellent wearing qualities. Made in various colors. Applied with brush or spray.

Covering Capacity—Approximately, 150 sq. ft. per gal. for 1 coat; 100 sq. ft. for 2 coats.

Marine Waterproof Paint—A decorative and protective coating for application to interior surfaces, swimming pools and surfaces immersed in water. It covers well and adheres firmly. Made in various colors.

Covering Capacity—Approximately, 150 sq. ft. per gal. for 1 coat; 100 sq. ft. per gal. for 2 coats.

Aquatint Cement Paint—Cement paint in powder form for use over concrete, stucco and other virgin masonry surfaces, outside or inside. Adheres firmly—giving a waterproof, decorative and lasting finish. Made in six colors.

Covering Capacity—9 lbs. and 3 qts. of water will make 1 gal., which covers approximately 100 sq. ft., 2 coats.

Roof Coating No. 5—A pure Trinidad asphaltum product having remarkable adhesive and saturating properties for overcoating and waterproofing roofs of every description. Restores life and waterproofing properties to any roof which has been exhausted by exposure to the sun. It is applied cold with a brush.

Covering Capacity—Approximately, 100 sq. ft. per gal. for 1 coat.

Sterilite Flat Wal-Finish—A high grade washable paint for finishing interior plastered surfaces.

Wal-Wite Enamel and Undercoating (Mill White)—A high grade mill white possessing high light reflecting qualities.

Particularly useful for application to walls, ceilings and columns for daylighting interiors. It retains its whiteness and can be repeatedly washed without injuring it. Will not turn yellow.

Aquabar Sanitary Enamel—For interiors of hospitals, sanitariums and similar institutions where a washable, durable coating is required. Will not turn yellow.

Fabricators Red Oxide—A high quality linseed oil oxide product for use on iron and steel, shop coat. Remains in suspension, has large covering capacity and flows easily beneath the brush.

Covering Capacity—Approximately 300 sq. ft. per gal.

Carbonite Steel Coating—Protective steel paint for field coat of exposed structural steel. Formulated to meet the most advanced theories and principles of the protection of iron and steel against corrosion.

Covering Capacity—Approximately 250 sq. ft. per gal., 2 coats.

Acid Proof Paint—A quick drying asphalt paint which leaves a hard, glossy surface. Can be applied with equal effectiveness to metal, wood and concrete. Widely used for painting inside of silos and for such portions of refrigerating plants as may be exposed to brine or ammonia fumes. For protection of woodwork and metal against corrosive gases and acid fumes.

Covering Capacity—Approximately, 250 sq. ft. per gal., 1 coat; 125 sq. ft., 2 coats.

Hot Surface Paint—A black elastic paint for exterior and interior, used on stacks, boiler fronts, pipes, etc. Will not crack, peel or blister when subjected to heat or chemical actions of smoke or gases.

Other Aquabar Products

Boiler Compound—A specially designed compound manufactured from heat resisting gums, non-drying oils and asbestos fibre. Applied directly to a boiler wall with a trowel to a thickness of ⅛ of an inch it will fill all cracks, crevices and pores, thus preventing the infiltration of air and permanently seals the boiler wall. Made in black and red.

Hot Self-sealing Foundation Asphalt—A specially prepared asphalt compound in solid form which must be heated and then applied with a mop. Used for membrane waterproofing or as a coating by itself for subgrade waterproofing. Melting point, 150° F.

Covering Capacity—Approximately 33 sq. ft. per gal., 1 coat.

Tripleseal Waterproofing Felt or Fabric—Bitumen saturated fabric particularly recommended for membrane waterproofing. Meets standard requirements for waterproofing fabric—combines strength and stretch with high absorption properties.

Shipped in rolls of 432 sq. ft. 32 in. wide, weighing approximately 15 lbs. per 100 sq. ft.

Fabricseal Spandrel Cloth—A special woven fabric fully saturated with Aquabar Waterproofing Asphalt for waterproofing spandrel beams, possessing elastic properties and tensile strength necessary to hold waterproofing in place. Has a tensile strength of 65 lbs. longitudinally and 60 lbs. transversely.

Shipped in rolls of 216 sq. ft.; width, approximately 35 in. and length, 72 ft.

Expansion Joint Filler—An elastic compound for filling cracks in concrete floors and other surfaces. Remains waterproof and plastic—no shrinkage from sides of joints. Made in gray and black.

Aquabar Aquatex Calking Compound—A plastic material that is composed of weatherproof, waterproof and elastic bonding oils and gums, for the calking of window and door frames, pointing masonry and terra cotta joints and flashings of all kinds.

Made in green, gray, red, maroon, black and natural.

Ferrocon Metallic Waterproofing—Aquabar iron method for waterproofing concrete, brick and similar surfaces on interior against pressure. A finely powdered iron to be mixed with the sand, cement and water and applied with a brush to inside surfaces of foundations to waterproof against absorption of moisture and seepage of water. For use on old and new structures. Five coats recommended for pressure.

Quick Set Anti-freeze and Accelerator—This liquid is added to the water used in mixing mass concrete, cement mortar, etc., for accelerating the set so as to prevent freezing. Causes a rapid evaporation of the water and speeds the final set permitting work to continue in temperatures as low as 20° F.

CLEAR COAT NO. 2

Unequalled Standard Colorless Waterproofing

For Waterproofing and Dampproofing Buildings, Residences, Stadiums, and Other Structures Constructed of Brick, Stone, Concrete, Cement, Stucco, Terra Cotta, Precast Stone, Limestone, Etc.

Making Buildings Rainproof and Preventing Efflorescence

After numerous tests conducted over a period of years, both application in the field and analysis, CLEAR COAT has been selected and proven as a most successful waterproofer for the largest structures in Florida, protecting them against the ravages of the tropical elements.

CLEAR COAT, when applied to the exterior surface, seals the pores and haircracks, forming permanent water-repelling crystals in the voids and rendering the surface absolutely impervious to water and dampness from atmospheric moisture to driving rains.

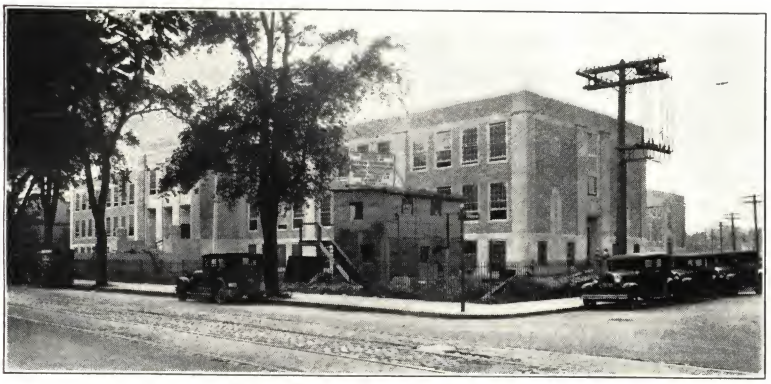
Leading architects of today have adopted CLEAR COAT as a standard for rendering exterior masonry surfaces watertight and preventing efflorescence. Recommended for both old and new buildings.

Send for detailed information and references—no obligation.

Hotel Breakers, Palm Beach, Fla.

After exhaustive tests Aquabar Clear Coat No. 2 Colorless Waterproofing Liquid was selected to waterproof exterior walls of entire structure against hurricane, driving rains, high winds, etc.

Applied by METAL PRODUCTS CO. OF MIAMI, FLA., INC.



Mary Curly School, Boston, Mass.

McLAUGHLIN & BURR, Architects MATHEW CUMMINGS Co., Contractors

Aquabar Clear Coat No. 2 Colorless Waterproofing Liquid and Aquabar Aquatex Calking Compound applied to above building

Specifications

New Buildings—All exterior masonry surfaces shall receive not less than 2 coats of CLEAR COAT No. 2 either by brush or spray.

Old Buildings—Apply not less than 2 coats of CLEAR COAT No. 2 and as many more as are necessary to take up all absorption. Before applying, all surfaces should be cleaned, all loose mortar raked out and joints calked. Special care should be given to joints around window openings and flashings. Apply by brush or spray.

A FEW AQUABAR USERS

Fox Theatre Building, Philadelphia, Thos. W. Lamb, architect.
Packard Building, Philadelphia, Ritter & Shay, architects.
Gimbel Brothers' Department Store and New Broad St. Station Bldg., Penna. R. R., Graham, Anderson, Probst & White, architects.
Breakers Hotel, Palm Beach, Schultze & Weaver, architects.
Florida East Coast Railway Warehouse, Miami, C. G. Henninger, architect.
Cathedral of the Blessed Sacrament, Altoona, Geo. I. Lovatt, architect.
Institutions for the State of New Jersey, Dept. Inst. & Agencies, architects.
Butterfly Hosiery Mill, Drummondville, Quebec, and Greening Wire Co. Bldg., Hamilton, Ontario, B. H. & F. Prack, architects.
Monterey Union High School, Monterey, Cal., Swartz & Ryland, architects.
Mary Curly School, Boston, McLaughlin & Burr, architects.
York Filtration Plant, York, Fuller & McClintock, engineers, Palmer & Lamdin, architects.
Alden Park Manor Apartments, Philadelphia (3 buildings).
Y. W. C. A., Atlantic City, S. V. Mathis, architect.
Savannah Power & Light Co. Bldg., Savannah, Stone & Webster, engineers.
Soldiers' & Sailors' Memorial Bridge, Harrisburg, J. E. Greiner Co., engineers.
Chemistry Building, U. of W. Va., Morgantown, Davis, Dunlap & Barney, architects.
Roaring Creek Reservoir, Shamokin, Gannett, Seylee & Fleming, engineers.
High School, Middletown, Del., Guilbert & Betelle, architects.
Liberty Loan Bldg., Washington, D. C., Jas. A. Wetmore, archt.
Convalescent Building, Perry Point, Md., U. S. Veterans Bureau.
Swimming Pool, St. Louis Coliseum.
Bell Telephone Buildings, Florida and Pennsylvania.
Institutions for City of Philadelphia, P. H. Johnson, archt.
Trunk Sewers, Allentown, E. W. Meckley, City engineer.
Power House & Engine Terminal, Harmon, and Coach Repair Shop, Buffalo, for N. Y. C. R. R., F. B. Freeman, chief engineer, A. E. Dougherty, designing engineer.
Quaker City Cold Storage Warehouse, Philadelphia, Ballinger Co., engineers.

THE ASPHALT PRODUCTS CO., INC.

Manufacturers of Bituminous Products

Eastwood Station
SYRACUSE, N. Y.

DISTRIBUTERS IN MANY CITIES OF THE UNITED STATES

Products

123 "Hydro Proof"—a permanent Waterproofing and Dampproofing Agent.

"Hydro Proof" Plaster Bond.

Also manufacturers of "Hydro Proof" Plastic—a Calking Compound, No. 115 Plastic Cement, "Silver-Seal"—an Aluminum Paint for interior and exterior use.

Hydro-Proof

123 "Hydro Proof"—A Permanent Waterproofing and Dampproofing Agent

For walls, floors, cisterns, pits, etc.

123 "Hydro Proof" is pure Mexican base asphalt atomized and held in suspension in a water vehicle without the use of oils, solvents or adulterants. Having the physical characteristics of water, it is carried by capillary attraction into every pore and void of the surface on which it is applied. It is odorless and tasteless, and expands and contracts without checking or cracking.

Superficial Method—Engineers and architects agree on the success of this method. It embraces the use of 123 "Hydro Proof" applied to the surface by brushing, mopping, or spraying. Its application on the outside of walls below ground level is desirable, and it will be found fully efficient for inside use except where high hydrostatic pressures exist.

Specification for Superficial Method—*For use on new or old walls where high hydrostatic pressure does not exist.*

The outside [inside] face of all foundation walls below grade level shall be treated with 123 "Hydro Proof" Waterproofing as manufactured by The Asphalt Products Co., Inc., of Syracuse, N. Y.

Application—All surfaces shall be dry, free from dust, oil and grease to assure proper penetration. Thoroughly stir contents of container and reduce part for the bonding or priming coat with not more than 20% clean water by volume. "Hydro Proof" shall be applied at a temperature not lower than 50° F. with a clean brush or mop (free from oil and grease) or spray, covering approximately 80 sq. ft. per gal. After priming coat has set, apply a full strength coat (material as received thoroughly stirred).

Protection—The final coat shall be protected with a ½-in coating of cement mortar.

Note: Where this waterproofing has been applied on exposed masonry surfaces and black color is objectionable, use the following clause:

Finishing Coat—The final coat on all exposed walls shall be covered with a thin wash of portland cement and sand brushed on. After the finishing coat has set apply with a brush a coat of ..... stucco color.

Membrane Method—Here again, the superiority of 123 "Hydro Proof" is apparent, as it bonds perfectly without decreasing the crushing or tensile strength of the construction, and in addition to its water, acid and alkali resisting qualities has the necessary characteristics of strength and flexibility to bridge over hair cracks in the concrete due to defective workmanship or other causes.

The membrane is built as an inset in the concrete wall, floor, etc., and forms an indestructible waterproof skin, excluding all moisture. It is protected from abrasion by the concrete on both sides.

It has been found by experience that about ½ in. from the finished thickness on the water pressure side is the proper place to introduce the 123 "Hydro Proof" membrane. It does not allow penetration of sufficient moisture in the remaining concrete applied over the membrane to cause trouble from freezing, or the penetration of acids, alkalis, etc.

Specification for Membrane Method—*For use on new walls and floors where hydrostatic pressure exists.*

The outside face of all foundation walls, top of footings, and the surface of all concrete floors at least 4 in. below finished floor level shall be treated with 123 "Hydro Proof" Waterproofing as manufactured by The Asphalt Products Co., Inc., of Syracuse, N. Y.

Application—All surfaces shall be dry, free from dust, oil and grease, to assure proper penetration. Thoroughly stir contents of container and reduce part for the first coat with not more than 20% of clean water by volume. "Hydro Proof" shall be applied at a temperature not lower than 50° F., brushing it thoroughly on the unfinished concrete (the brush shall be free from oil and grease). When set, flow on a heavy second coat (full strength), using 2½ to 3 gal. per 100 sq. ft.

Protection—The final coat on all vertical surfaces shall be protected with at least ½-in. coating of cement mortar [.... in. of concrete].

The final coat on all floors shall be protected with .... in. of concrete including a 1-in. finished surface.

Note: Not less than 4 in. of concrete should ever be used where hydrostatic pressure exists. Mass concrete should be sufficient in weight to withstand the pressure, or where less concrete is desired, the concrete slab between waterproofing membrane and finished floor must be reinforced.

"Hydro Proof" Plaster Bond

For bonding plaster or stucco to concrete, brick, tile, gypsum, etc.

This permanent waterproofing agent being atomized pure Mexican base asphalt, suspended in a water vehicle without the use of solvents, oils or adulterants, has the physical characteristic of being absorbed by capillary attraction into any porous wall construction over which it is applied, permanently sealing same against dampness and moisture which would otherwise penetrate and stain the interior finish.

"Hydro Proof" Plaster Bond eliminates the necessity of furring or lathing except on ceilings.

Used on woodwork to be set against new masonry or construction subject to moisture, it will prevent rotting, cracking or warping. Remains elastic—expanding or contracting under all atmospheric variations.

Specification for Plaster Bond—*For use on old or new interior or exterior masonry walls and ceilings.*

General—All interior and exterior surfaces (specify surface) shall be given 2 coats of "Hydro Proof" Plaster Bond as manufactured by The Asphalt Products Co., Inc., of Syracuse, N. Y.

Preparation of Surface—Surfaces shall be dry, and free from all loose and foreign materials. Where paint, oil, grease, etc. are present, a suitable cleaner shall be used, the surface flushed with clean water and permitted to dry.

Application—"Hydro Proof" Plaster Bond shall be applied in 2 coats with a new, clean, wide brush or suitable spray.

If brush is used, the first coat shall be diluted with 20% clean water, by volume; the second and final coat undiluted and as received in container.

If sprayer is used, "Hydro Proof" Plaster Bond shall be diluted to the consistency required by spray nozzle. Only sprayer suitable for heavy paints or asphalts shall be used.

"Hydro Proof" shall be brushed or sprayed in a continuous coat over all surfaces of walls, working it well into all corners and joints; also on walls where partitions and floor slabs will abut the exterior walls. When this is not feasible, it shall be carried out from the exterior walls for a distance not less than 12 in. on such intersecting partitions and floor slabs.

Note: The following provision shall be included by the Architect in his specification for Plastering Work.

Plaster or stucco shall be applied directly over "Hydro Proof" Plaster Bond after the latter has thoroughly set, which will be indicated by its being slightly tacky to the touch, but which will not adhere to the fingers.

BARNSDALL TRIPOLI COMPANY

FORMER NAME AMERICAN TRIPOLI COMPANY, INC. 1892

SUBSIDIARY OF BARNSDALL CORPORATION

Barnsdall Admix for Concrete

2111 Railway Exchange Building, ST. LOUIS, MO.

HOME OFFICE AND PLANT: SENECA, MO., U. S. A.

DEALERS AND STOCKS IN PRINCIPAL CITIES

"BE SQUARE" PRODUCTS (Reg. U. S. Pat. Off.)

Facilities

Electrified plant. Electric railroad to our mines. Large stock carried for immediate shipment. Capacity to serve the largest job promptly. Centrally located plant on main line of railroad. We have shipped internationally for thirty-eight years. Shipment made in 100-lb. bags, or in bulk.

Barnsdall Admix is extensively used throughout the United States and foreign countries by utilities, railroads, outstanding engineers, architects, and contractors, Federal, State, county, and municipal departments.

Technical Description

Barnsdall Admix is pure, finely ground, meta-colloidal tripoli silica (active silicon dioxide, 97½% SiO_2) to be mixed integrally with concrete. It is a low water-factor admixture. Microscopic examinations show the particles to be more or less rounded and each particle, however small, is porous, the pores being of submicroscopic size. When used in concrete it mixes instantly, insures uniform mixing, clean discharge from mixer, and thoroughly lubricated concrete. It does not "ball up" in the mixer and requires no special mixing process—merely add it to other ingredients in hopper or mixer. When the cement or concrete sets, Barnsdall Admix enters into the chemical and physical reactions and becomes an integral part of the cement and concrete. It is insoluble and cannot be carried away by water or corrosive elements. Barnsdall Admix does not affect the time of setting.

Barnsdall Admix is a distinctive mineral, similar to hardened silica gel, and occurs only at Seneca, Missouri. It is mined, dried, ball-milled finer than cement, screened, air separated, and sacked. No chemicals or adulterants are added.

Advantages of Barnsdall Admix

Concentrated—Barnsdall Admix is the most concentrated admixture and waterproofing known. It contains no water, clay or other adulterants or impurities, which means a large saving in freight and increased efficiency on the job as less material is required, as proved by certified analysis appearing on this page.

Flowability—Flow tests in the laboratory and field show that Barnsdall Admix doubles the flowability of plain concrete and gives more flowability per pound of material than any other admixture, without the use of additional or excess water.

Uniformity—No Segregation—Explained above.

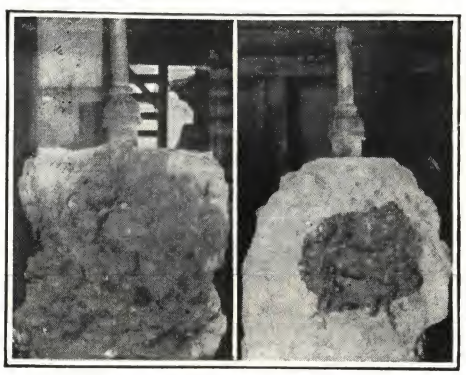
Watertightness, Durability, Permanence—Barnsdall Admix insures watertightness, durability and resistance to disintegration in two ways: (a) by making concrete physically resistant through increasing the density and watertightness, and reducing shrinkage cracks, and (b) by making concrete chemically resistant through enabling the use of less cement, and through adsorbing the free hydrated lime which is liberated by hydrolysis of the calcium silicates during the setting of cement.

Other Advantages

Barnsdall Admix prevents leakage of cement, reduces shrinkage and prevents disintegration, thereby insuring "constant volume" concrete. Efflorescence is decreased, and with proper workmanship, a smoother surface is obtained through the elimination of honeycombing and hair-checking. It causes better curing and greater strength. (List of several thousand strength tests sent on request.) Workmen prefer Barnsdall Admix because it contains no injurious chemicals or alkalis. Being pure silicon dioxide, it has no effect on other materials which may be used in or on cement and concrete. In storage, moisture has no effect on it, nor does its volume change when wet although it is easier to handle when dry. One ton occupies 34 cu. ft. (1¼ cu. yd.).

CHEMICAL ANALYSIS
By Robert W. Hunt Co.
(Air Dry Basis)

Silica	97.40%
Alumina	.15%
Iron oxide	.35%
Lime	.15%
Magnesium	Trace
Ignition loss	1.00%



PERMEABILITY TEST

Plain concrete completely penetrated at 100 lbs. per sq. inch water pressure within 48 hours.

Concrete integrally waterproofed with Barnsdall Admix withstood 250 lb. per sq. in. water pressure for five days.

Both cylinders 1:2:4 mix. Water-cement ratio .8.
Pierce Testing Laboratories, Inc.

Service

Consult with us regarding your concrete problems. Send us the number of bags of cement in your job and we will send quotation with recommendation for your particular type of work.

References

Barnsdall Admix has been used by various Government departments, such as U. S. Engineers, U. S. Veterans Bureau (Hospitals), U. S. Treasury Department (Federal Buildings and Post Offices), etc. Certified tests by all the well known laboratories sent upon request, along with list of users, and data sheet designed for your files.

Barnsdall Admix insures permanently stronger concrete buildings of better appearance with lower maintenance costs.

PHYSICAL PROPERTIES OF BARNSDALL ADMIX		AVERAGE SCREEN ANALYSIS (Cumulative)	
Weight of powder 55 lb. per cu. ft.	On	35-mesh	.01%
Neutral light buff color (has no effect on the color of concrete).	On	48-mesh	.12%
	On	65-mesh	1.38%
True specific gravity 2.2	On	100-mesh	4.37%
Water absorption by weight. 50% (Neither shrinks nor swells when wet).	On	150-mesh	7.18%
	On	200-mesh	9.67%
Fusing point 3300° F.	On	325-mesh	18.68%
*Last two percentages calculated from microscopical examination by the Pittsburgh Testing Laboratories on material passing through a 200-mesh screen.	Through	200-mesh	90.33%
	Through	325-mesh	81.32%
	*Through	500-mesh	80.75%
	*Through	750-mesh	42.50%

General Specification

In all concrete there shall be used .... pounds of Barnsdall Admix per bag of cement (according to table shown below) in strict accordance with directions of the manufacturer, the BARNSDALL TRIPOLI COMPANY, 2111 Railway Exchange Building, St. Louis, Missouri, as follows: Empty the bags of Barnsdall Admix into a box adjacent to the mixer. Provide a measure holding correct amount for each mixer batch. For mixers larger than one bag capacity weigh the correct amount of Barnsdall Admix for one batch into a pail; punch a hole in side of pail at material line and thereafter use as a measure.

Stucco, mortar, plaster (finishing, topping, walls, floors, curbs and cement products); 3 lb. of Barnsdall Admix shall be used per bag of cement, mixing same as above.

Siliceous Admixture Specification

In all concrete there shall be used .... pounds, per bag of cement (according to table), of a siliceous admixture conforming to the following specifications:

Pure active tripoli; not less than 95% silica (air dry basis), passing not less than 85% through a 200-mesh screen; weight not less than 40 lb. nor more than 70 lb. per cu. ft.; water absorption not less than 45% nor more than 55% by weight. It must not exceed the chemical limits for portland cement (except insoluble residue) and sand as set forth in A. S. T. M. Serial Designation C9-30 under chemical properties and C40-27.

Portland cement intimately mixed with 3% by weight of the siliceous admixture shall pass all the chemical and physical requirements for portland cement (except insoluble residue) listed under chemical and physical properties in A. S. T. M. C9-30.

Efficiency of Barnsdall Admix has been increased by a new heat-treating process in our new plant.

RECOMMENDED AVERAGE PROPORTIONS OF BARNSDALL ADMIX FOR VARIOUS MIXES

Mix	Barnsdall Admix per bag cement
1–1 –2	1 lb.
1–1½–3	2 lb.
1–2 –3	2 lb.
1–2½–3½	3 lb.
1–2 –4	3 lb.
1–2½–5	4 lb.
1–3 –5	4 lb.
1–3 –6	5 lb.

ESTABLISHED 1879

THE BILLINGS-CHAPIN CO.

Manufacturers of Paints, Varnishes, Stains, Enamels, Lacquers, Damp-proof and Rust Preventive Coatings and Technical Products

MAIN OFFICE AND FACTORIES
East 40th Street and N. Y. C. R. R.
CLEVELAND, OHIO

NEW YORK BRANCH, 438 Pearl Street

BOSTON BRANCH, 7 Elkins Street

Products

For over half a century, this company has manufactured paints and varnishes of the better kind, selling to discriminating users who are more interested in lowest per annum upkeep cost than initial outlay on a cost per gallon basis.

DRIWAL—CLEAR, WHITE and COLORS.
U. S. DECK PAINT.
U. S. MARINE WHITE and TINTS.
U. S. MARINE GREENS.
ARTONE FLAT WALL FINISH.
DECOLAC—RAPID DRYING VARNISHES, STAINS, ENAMELS.
DECOLITE—MILL WHITE.
BILCHACO CEMENT FLOOR COATING.
RUSTNAUGHT—ANTI-RUST PAINT.

Driwal
TRADE-MARK

Driwal — Damp-proofing, Stainproofing

A damp-proofing and decorative coating for concrete, stone, plaster, stucco, brick, etc., supplied in black, white, colors and clear. Applied by brush or spray it not only penetrates and lines the pores with an insoluble material but the colored Driwal provides the soft rich tones which bring out rather than obscure the artistic texture of the surfaces to which it is applied.

Driwal is recommended only where a clean, reasonably porous surface affords good penetration, and best results are secured where the Driwal is so applied as to secure this penetration.

It is such surfaces that are most likely to absorb moisture and dirt.

Driwal Clear

A colorless liquid which has a very important use, not only for excluding moisture, but especially for preventing stains and discoloration which from various causes mar the beauty of many otherwise imposing structures.

Driwal Clear is a safe material to use on the lightest colored, finest texture quarry products. It does not contain any wax or other material that would darken or discolor the stone. Keeps stone in its natural condition.

Specification Suggestions for Driwal Clear—For any application, surface should be dry, clean and free from all loose particles.

Two good saturating applications should be given, allowing the first to dry overnight before the second is applied.

Where stainproofing of cut stone is provided for before erection, all surfaces except the outside face should be given one saturating coat of Driwal Clear, preferably applied with a flat brush.

The exposed surfaces should not be treated until after erection and the building has been cleaned and tuck pointed and allowed to dry. The face of the building should then be given one or two coats (optional) of Driwal Clear, the second not to be applied until at least one day after the first coat.

Where old surfaces are to be stainproofed, additional provision must be made for cleaning prior to the Driwal application — scrubbing with sharp sand, clear water and a fibre brush, or sandblasting or steam cleaning. In such cases special stress should be laid on the necessity that surfaces be allowed to dry out thoroughly before Driwal is applied. On old work, one application is frequently sufficient.

The illustrations show a stainproofing test made by The Sargent Cut Stone Co., Topeka, Kan.

Portland cement was used to set the Indiana limestone and brick back-up in these two sections of wall. Both were drenched daily with water to secure maximum conditions favorable to stone staining.

Two months later, these photographs were taken. Upper section, badly stained, had not been treated with Driwal. Lower section, treated with Driwal on all six sides of the blocks, spotless as when first set up

Driwal White and Colors

For damp-proofing and tinting exterior or interior walls and decorating any ornamental work, stone or concrete, where reasonable penetration of the natural surface can be had.

Driwal Black

Supplied in three consistencies for below grade waterproofing.

Further Information

Color cards and complete specifications covering any of our products will gladly be furnished on request. We point with particular pride both to the character of many of the institutions we are serving and to the continuous use of our materials over periods of many years by an ever increasing number of large and discriminating buyers.

BUILDING CHEMICALS CORPORATION

"Chemicals for Building Construction"

51 East 42nd Street, NEW YORK, N. Y.

REPRESENTATIVES AND DEALERS IN PRINCIPAL CITIES

Products

WATERPROOFINGS and DAMPPROOFINGS for concrete and masonry (Integral and Surface Treatments); CONCRETE FLOOR HARDENERS and SPECIAL FLOOR TREATMENTS.

Service—Advisory, Research and Contract

(1) Sales engineers and dealers located at important points.

(2) A laboratory equipped to analyze unusual problems of concrete and masonry construction.

(3) A service organization trained to supervise or contract for the application of BCC Products.

(4) We service all jobs where our materials are used.

Quality of Materials

All our materials are made to conform with the Specifications and Recommendations of the Department of Commerce, Bureau of Standards, Washington, D. C., in-so-far as the data is available.

Specifications and Catalogue

For complete information and detailed specifications write for our publication "Chemicals for Building Construction."

References

List of architects or contractors or jobs using our materials will be furnished on request.

BCC Oil Waterproofing

A non-volatile oil compound of rather thick consistency produced from asphalt residuum, strained to a clear yellow, and saturated with aluminum stearate. The strained asphalt residuum oil is prepared to remain colorless in mortar and the full specification of stearate is used. These two ingredients are balanced and processed to secure an admixture that prevents sulphates in cement and lime from efflorescing and *reduces the capillarity of the mortar permanently. There is no waste—99% of the oil and combined materials remain to function throughout the lifetime of the mortar.*

Oil Waterproofing readily mixes with wet mortar without emulsifying; can be safely employed in temperatures normal to portland cement mortar; will not discolor white mortars and enhances the color of pigmented mortars. It eliminates nearly all tempering on the scaffold because the resultant mortar is fat, sticks and parges excellently.

Oil Waterproofing mixes mechanically with the mortar and is present in all pores. The mortar has full strength and *does not shrink from the brick.*

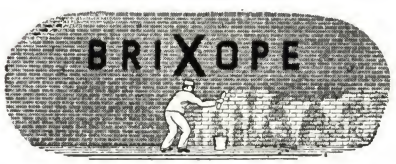
Oil Waterproofing is guaranteed to waterproof and prevent efflorescence when accepted specifications are followed.

Directions—Mix dry mortar ingredients with water to desired consistency; add BCC Oil Waterproofing in proportion of 4½ gals. per cu. yd. of mortar; allow mixer to turn over until oil is assimilated and mix is of uniform color.

BriXope Concentrated

A combination of stainless, highly refined mineral oils, processed to be mixable with water. Contains no acid.

BriXope Concentrated removes dirt and efflorescence when used as a cleaning-down agent on brickwork; prevents further leeching out of efflorescence and acts as a dampproofing and brick preservative. Clean, colorless in appearance and effect, it leaves no impurities within or without the brick or mortar joint.



Directions for Cleaning Down New Brickwork—Rub down brickwork with dry, stiff fibre brush; scrub over each spot twice with a solution of 1 part BriXope Concentrated to 4 parts water. Allow to dry.

Directions for Cleaning Down Old and Badly Stained Brickwork—Rub down as above; wash with a solution of 1 part muriatic acid to 3 parts water; immediately scrub over each spot twice with a solution of 1 part BriXope Concentrated to 3 parts water. Allow to dry.

Note: The above operations follow each other and can be performed in one hanging of the scaffold.

BCC Colorless Dampproofing

A clear solution of paraffin, stearate, waterproofing gums and oils in a colorless volatile solvent (hydrocarbon), similar to naphtha but less inflammable, processed to dry with least possible color change. Preserves and dampproofs new masonry surfaces; used on old masonry surfaces to prevent moisture from entering the wall. Is best applied in hot weather, in two coats—not less than 24 hours apart. Greatest efficiency secured above 75°, but can be applied in temperatures as low as 60°. (Special material must be ordered for application in lower temperatures.)

Directions—Spray or brush on surface as much BCC Colorless Dampproofing Liquid as it will absorb. When the solution fails to penetrate, further application is unnecessary. Two coats are usually sufficient.

Note: This material, in conjunction with liquid joint fillers, is also applied by our own organization under a special patented compressed air process, with guaranteed results.

BCC Crystal Hardener

A cement floor after-treatment—a double crystalline fluosilicate compound which, when dissolved in water, forms a solution that reacts on the free calcium in the cement topping to form calcium fluoride, thus providing a hard, flintlike surface which wears smooth and glossy under foot.

Hard-n-tyte Surface Hardener

This cement floor hardener, manufactured by the General Chemical Company, can be supplied from our stock.

BCC Color Coating

Where a decorative finish is required, specify BCC Color Coating in the desired color. It seals the pores and eliminates concrete dusting, guards the floor surface against traffic and wear, and gives a high gloss finish, easily maintained.

BCC Liquid Integral Waterproofing

A chemical solution for use in waterproofing concrete and masonry—to be incorporated in concrete below grade, cement finish and brick mortar. It is the most simple and economical method. BCC Liquid Integral Waterproofing is an all-season waterproofing—indispensable for winter work. It pays for itself in increased plasticity and labor saving.

BCC Integral Hardener

A compound added to mixing water to quickly develop full hardness and strength of cement finish. It densifies the mass and makes entire surface more resistant to abrasion.

BCC Metallic Floor Dressing

A 20-40 mesh iron, oil-free—prepared for troweling into the surface of concrete or cement floors during construction.

CAFFALL-CORNMAN CORPORATION

Masonry Preservers and Waterproofers
"Caffall's Scientific Process"

TELEPHONE
BArclay 7-1231

9-15 Park Place
NEW YORK, N. Y.

Services

WATERPROOFING and DAMPPROOFING CONTRACTORS specializing in "CAFFALL'S SCIENTIFIC PROCESS" for WATERPROOFING and PRESERVING all types of masonry above grade.

Process

This process is the original method for permanently waterproofing and preserving stonework of all kinds.

It consists of applying pure molten paraffin wax to pre-heated surfaces of marble, limestone, brick, terra-cotta, stucco, etc., either old or new. The wax is drawn deeply within the masonry and all remaining upon the surface is removed, leaving the surface permanently in its natural color and tone.

This process is unaffected by salt efflorescence. The preservative used is also unaffected by acid and alkali solutions, gases and moisture, and is highly resistant to oxidation.

One treatment will last as long as the surface to which it is applied.

"Caffall's Scientific Process" is not an experiment, it has stood the test of time and has an enviable record for durability. Structures treated with it over 50 years ago are still waterproof and in good condition.

Guarantee

We guarantee that the masonry treated by us with "Caffall's Scientific Process" will not discolor, disintegrate, chip, break, crumble, or allow the penetration of moisture or water for a period of twenty (20) years from date of treatment; or should any of the aforesaid defects occur during that period we will treat same where necessary without charge.

Old Trinity Church, Broadway and Wall Streets, New York, N. Y.
Treated 1926

Where Used

Among some of the well-known structures that have been successfully treated by this process are the following:

The Obelisk in Central Park, New York, N. Y.
Fraunces Tavern, Broad Street, New York, N. Y.
Old Trinity Church, Broadway and Wall Street, New York, N. Y.
Alexander Hamilton Monument, New York, N. Y.
New American Wing of the Metropolitan Museum, New York, N. Y.
New York Cotton Exchange, New York, N. Y.
Savoy-Plaza Hotel, New York, N. Y.
Buckingham Memorial, Grant Park, Chicago, Ill.
Pasteur Memorial, Grant Park, Chicago, Ill.

Carrara Marble Treatment, Woodlawn Cemetery, New York, N. Y.

References

New York, N. Y.

Geo. A. Fuller Co., Building Construction
Cass Gilbert, Architect
H. deB. Parsons, Consulting Engineer
Bowen Bancroft Smith, Architect

Other Cities

Bennett, Parsons & Frost, Architects, Chicago, Ill.
Hacker & Hacker, Architects, Fort Lee, N. J.
Whiton & McMahon, Architects, Hartford, Conn.
Edward Turgeon, Building Construction, Providence, R. I.
John P. Koch, Architect, Rocky Mount, N. C.

Savoy-Plaza Hotel, New York, N. Y.
Treated 1928

CERESIT WATERPROOFING CORPORATION

Waterproofings, Dampproofings, Floor Hardeners, Protective Coatings
512 South Canal Street, CHICAGO, ILL.

Products

CERESIT WATERPROOFINGS (Integral).
CRESOLAC TRANSPARENT WATERPROOFING.
CERESIT METALLIC WATERPROOFING.
CERESIT METALLIC HARDENER.
INDURITE LIQUID HARDENER.
CEROX COLORED CEMENT.
CERETONE CEMENT COLORING PIGMENT.
LUXSTAR WATERPROOF CEMENT COATING.
CERESIT DAMPPROOFING and PLASTER BOND.
CERESIT CAULKING COMPOUND.

Service

The experience of twenty years in the manufacture of waterproofings and allied products, enables us to supply any required technical service.

Ceresit Waterproofing Compound

Ceresit Waterproofing Compound is a plastic paste. It *waterproofs, densifies* and *lubricates* concrete and other cement mixtures.

Its use insures waterproofness, increases workability and permits a remarkable reduction in the water content, thus adding to the strength and density of concrete.

Requirements—For mass concrete use 7-8 lbs. per cu. yd. in the proportions of one part Ceresit to 24-36 parts water. For cement topping and cement mortar use 8 lbs. per 100 sq. ft., 1 in. thick, in the proportions of one part Ceresit to 18 parts water. One pint of Ceresit weighs 1 lb.

Ceresit Waterproofing Powder

Ceresit Waterproofing in powder form is more adaptable to certain classes of work. Thorough mixing of the powder and Portland cement is essential.

Requirements—2 lbs. per sack (94 lbs.) of Portland cement.

Ceresit Waterproofing Liquid

Ceresit Liquid contains the same basic materials as Ceresit Compound. It is added to the tempering water in mixer.

Requirements—1 gal. per cu. yd. of concrete, or 2/3 qt. per sack (94 lbs.) of Portland cement.

Cresolac Transparent Waterproofing

Porous and moisture absorbent surfaces can be permanently waterproofed with Cresolac Transparent Waterproofing without changing the surface color or appearance. Applied with spray or brush. Cresolac effectively seals and waterproofs brick, stone, stucco, plaster, concrete and masonry surfaces. It protects against staining, frost checking, and untimely disintegration due to extreme temperature changes.

Building exteriors treated with Cresolac are protected for all time against driving rains. Every rain washes and cleans the surface.

Cresolac contains no wax or paraffin, but fills and seals the surface pores with an insoluble water-repellent agent which leaves no evidence of its presence.

Requirements—Brush Coating—Apply 2 coats, 24 hours apart.

Spray Coating—One thorough application is sufficient. Complete saturation of the entire surface is essential.

The covering capacity depends upon the porosity of the material to be treated. One gallon of Cresolac will cover approximately 100 sq. ft. for two brush coats or one spray coat.

Ceresit Metallic Waterproofing

A finely pulverized chemically treated iron compound for waterproofing by what is known as the iron method. Ceresit Metallic Waterproofing provides a thoroughly practical method of waterproofing basements, pits, and similar work. It is equally applicable to new and old structures.

General Specifications—The waterproofing contractor shall use Ceresit Metallic Waterproofing and apply same in accordance with the directions of the manufacturer, CERESIT WATERPROOFING CORPORATION, Chicago.

Ceresit Metallic Hardener

Ceresit Metallic Hardener is made from properly graded, machine screened, pulverized iron. It is entirely free from oil, grease and other impurities. The incorporation of Ceresit Hardener in the topping of concrete floors produces a hard, dense, wear-resistant and dustproof surface. It is made in 2 colors, gray and red, and shipped in 100 lb. bags.

Application—For general work use 30 lbs. per 100 sq. ft. For heavy duty floors use 40 lbs. per 100 sq. ft.

General Specifications—All indicated concrete floor areas shall be hardened by incorporating in the topping, by troweling, Ceresit Metallic Hardener. It shall be used in accordance with the directions of the manufacturer, CERESIT WATERPROOFING CORPORATION, Chicago.

Indurite Liquid Hardener

A liquid chemical for surface application to new or old concrete floors. It hardens and dustproofs by chemical reaction and neutralization.

Requirements—100 sq. ft. per gal. for 2 coats.

Cerox Colored Cement

Cerox is a ready-mixed cement in colors to be used wherever a colored cement surface is required. It is a combination of selected oxide colors, Ceresit Waterproofing and Portland cement, accurately proportioned, reground and machine mixed.

Cerox insures permanent and attractive cement finishes. Recommended for concrete floors, walks, drives, pools, porches, stucco, and all cement work, outdoors or indoors. It comes to the user ready proportioned, which insures uniformity of color in the finished work. If kept dry it will not deteriorate.

Cerox contains all materials for concrete floor topping or stucco finish with the exception of the necessary sand.

Requirements—Used in the same manner as Portland cement, requiring the following:

¾ in., 228 lbs. per 100 sq. ft. ½ in., 152 lbs. per 100 sq. ft. Shipped in 50 and 100-lb bags.

Ceretone Cement Coloring Pigment

Ceretone is a coloring compound in paste form to be dissolved in the mixing water. Its greatest use is for coloring concrete floors. It produces an attractive floor surface of uniform and permanent color, extremely hard, wear-resisting, dustproof, and waterproof. Its quicksetting properties make early use of the floor possible.

Ceretone is made of pure oxide colors of the highest grade obtainable. It readily dissolves in the mixing water and is added to the batch in this form.

Requirements—Quantities of Ceretone Coloring Pigment required per sack of Portland cement;

Red, 12 lbs.; Black, 12 lbs.; Buff, 15 lbs.; Green, 15 lbs.

Luxstar Waterproof Cement Coating

A decorative coating for concrete, stucco, plaster, brick, cement block, stone and similar surfaces. It is excellent for basement walls and ceilings.

Luxstar is a waterproof paint pigment in powder form. Mixed with water, it is applied like ordinary paint with brush or spray. Luxstar provides a waterproof paint film which will retain its color and will not peel, crack or check. Made in colors.

General Specifications—All indicated surfaces shall be waterproofed with Luxstar (here specify color) which shall be applied in accordance with the directions of the manufacturer, CERESIT WATERPROOFING CORPORATION, Chicago.

Ceresit Dampproofing

A heavy asphaltic paint for dampproofing foundation walls and substructure work.

Requirements—60-75 sq. ft. per gal. for one coat, 40-50 sq. ft. per gal. for two coats.

Ceresit Plaster Bond

A dampproofing and bonding asphaltic compound for application on the inside surfaces of outer or exposed walls before application of plaster.

Requirements—60-75 sq. ft. per gal. for one coat, 40-50 sq. ft. per gal. for two coats.

Ceresit Caulking Compound

Ceresit Caulking Compound is a plastic, puttylike material adapted for every class of caulking, glazing and pointing work. It remains pliable and elastic and is not affected by temperature changes.

CONCRETE MATERIALS CORPORATION

Manufacturers of Concrete Specialties

OFFICE AND FACTORY
318-320 West Austin Avenue
CHICAGO, ILL.

Products

CONCRETE SPECIALTIES as follows:
Metallic Hardener
Iron Waterproofing
Liquid Hardener
Integral Waterproofing Powder
Transparent Waterproofing
Repair Cement
Floor Resurfacer
Colored Pigment
Colored Cement
Integral Liquid Hardener and Waterproofing
Accelerator
Concrete Coating
Admixture
Also Comco Plaster Bond, Dampproofing and Stone Backing.

"The Best by Test"

Comco No. 1 Metallic Hardener

Gray integral metallic hardener, incorporated in the topping. For heavy duty floors in warehouses, shops, platforms, runways, etc.

Specify 25 to 40 lb. per 100 sq. ft., depending on the duty required of the floor, and placed according to manufacturer's directions.

Also in red and other colors for decorative floors.

Comco No. 2 Iron Waterproofing

Chemically prepared metallic waterproofing for waterproofing concrete, brick or stone walls and floors after completion of construction; below water level basements, pits, etc., under pressure; and for all classes of construction where a positive waterproof condition is necessary.

Successful under all conditions no matter how severe.

Applied to the surface in 3 coats. Specify 40 lb. to 100 sq. ft., according to manufacturer's directions.

Comco Metallic Binder

For a perfect bond between the slab and topping finish for old or new floors.

Comco No. 3 Liquid Hardener

A liquid-after-treatment for new or old floors. Gives a dustproof and wearproof surface when applied according to manufacturer's directions.

One gallon required for each 100 sq. ft.

Comco No. 4 Integral Waterproofing Paste

An integral waterproofing for mass concrete or cement mortar. Also in liquid or powder form.

For Mass Concrete—Specify 8 to 10 lb. per cu. yd. of concrete, as per manufacturer's directions.

For Cement Plaster—Use 2½ lb. per 100 sq. ft., ¼ in. thick.

For Cement Stucco—Use 4 lb. per 100 sq. ft., ¼ in. thick.

Comco No. 6 Transparent Waterproofing

For sealing the pores and repelling the water from concrete, brick, stone, stucco, plaster or masonry surfaces. One gallon covers 150 sq. ft., two coats.

An effective surface waterproofer.

Applied with brush or spray.

Comco No. 7 Repair Cement—Quick Setting

For patching concrete floors, driveways, platforms, swimming pools, basements, alleys, etc. Sets over night.

Comco No. 8 Floor Resurfacer

A resurfacing cement for replacing an old and worn topping on concrete floors. Can be applied any thickness from ¼ in. up. Sets up in 24 to 48 hours.

Special instructions furnished.

Comco Colored Pigment

Put up in paste form to be dissolved in the mixing water. For coloring concrete floors. Makes an attractive floor of permanent and uniform color. Wearproof, dustproof and waterproof.

Sets quickly, allowing early use of floor. Dissolved in mixing water and added to the batch in this way. Uniform in color. The uncertainty of uniformity where dry colors are used is eliminated.

Comco No. 11 Colored Cement

Made for topping of concrete floors, walks, drives, stucco finish or any cement finish, inside or outdoors, also for manufacture of concrete products.

Comco No. 13 Integral Liquid Hardener and Waterproofing and Accelerator

Added to the gauging water. One quart to each bag of cement used.

Comco No. 15 Concrete Coating

A high grade concrete paint for floors, etc., that is lasting.

Colors: white, cream, buff, gray, brown or red.

Apply over dry clean surface in two coats.

Covering capacity approximately 150 to 175 sq. ft., two coats.

Alberoyd Admixture

Makes better concrete. Used in U. S. Government work.

COSMOPOLITAN CHEMICAL COMPANY, INC.

Manufacturing Chemists

GENERAL OFFICES, LABORATORIES AND PLANT
23-30 Fiftieth Avenue, LONG ISLAND CITY, N. Y.

Organization

The Cosmopolitan Chemical Company, Inc., has been manufacturing waterproofing and dampproofing materials for the past 14 years. Our large up-to-date plant and efficient organization is equipped for quantity production.

Service

The trade is invited to consult us with waterproofing or dampproofing problems. We offer the services of our Investigation, Research and Laboratory Departments.

All prices f.o.b. Long Island City, N. Y.

WATERPROOFINGS, DAMPPROOFINGS AND CONCRETE HARDENERS

Our Products Are Guaranteed with a Bond to Perform as Represented

Cosmoproof No. 80 Dampproofing Paint (Black)

Liquid with Asbestos—Brush Consistency—Cosmoproof No. 80 is a technically manufactured product containing the finest grades of asphaltum (a combination of native and Gilsonite), long Canadian type asbestos fibre and specially treated asphaltum oils. Surface will stand traffic 24 hours after application. Will not run in the summer nor crack in the winter.

Uses—For waterproofing and dampproofing interior of exterior brick and concrete walls; sheet metal (new or old), composition, felt paper, gravel, tin, shingle, canvas or cement roofs; penthouses; for preserving gutters; spray decks, decklines; tanks; oil and water lines; coolers; insulating cold storage rooms and boxes; prevention of electrolysis; tanks and tank cars; pipe lines; oil storage tanks; bridges; ventilators; all machinery (except bearing parts); gondola cars and carriages; garages (roof and sides); steel rails (railways); structural steel and iron fences; water towers and the surfaces of all metals.

Covering Area—For dampproofing and waterproofing, 1 gal. will cover 100 to 150 sq. ft.—one coat.

Prices and Container Sizes—Shipped in 5, 10, 20, 30, 60-gal. steel drums. Prices range from 35¢ per gallon for 60-gal. steel drums to 45¢ per gallon for 5-gal. drums.

Cosmoproof No. 81 Expansion and Contraction Waterproofing Cement (Black)

Plastic Trowel Consistency—Cosmoproof No. 81 is the same waterproofing as No. 80 only that it is plastic. Applied cold by trowel and does not require heating. It protects against destructive agencies and abrasion. On foundation walls, etc., it can be used with either open mesh untreated burlap or with waterproof felt paper to produce a waterproof membrane. It is waterproof and retains its elasticity indefinitely.

Uses—For waterproofing interior of exterior brick or concrete walls below grade. Waterproofing cellar bottoms, fire walls, skylights, flashings, copings, tile, vent pipes, chimneys, boiler pits, parapet walls and expansion joints in walls.

Covering Area—The thickness of the application of material will be determined by the existing conditions. However, as a basis for estimating, ⅛-in. thickness will be considered as an average and 1 gal. of Cosmoproof No. 81 will cover 15 sq. ft.—one coat.

Prices and Container Sizes—Same as Cosmoproof No. 80.

Cosmoproof No. 83 Caulking and Glazing Compound (Black)

Gun and Hand Consistency—Cosmoproof No. 83 is a scientific preparation for caulking and glazing work with proper consistency for gun as well as hand application. It is a combination of elastic waterproofing oils, mixed with asbestos fibre, making a finished product that is absolutely waterproof and airproof. It is adhesive and will not crumble and become brittle.

Expands and contracts during all atmospheric changes and endures vibration without releasing its caulking qualities, thereby making a complete finished job that is serviceable and lasting. It adheres perfectly to wood, steel, masonry or glass.

Uses—For caulking door frames and windows.

Caulking Capacity—Owing to cracks or openings varying in sizes, it is difficult to estimate just how much caulking compound would be required. However, a close estimate would be about 200 lineal feet to the gallon or approximately 10 windows (3x6 ft.) to the gallon.

Prices and Container Sizes—Same as Cosmoproof No. 80.

Cosmoproof Automatic Gun—We also furnish an automatic gun for the application of Cosmoproof No. 83. Price, $4.50 each.

Cosmoproof No. 87 Transparent Oil (Colorless)

Brush or Spray Consistency—Cosmoproof No. 87 protects against water penetration and dampness. It is applied with ordinary paint brush or sprayed. It becomes effective by penetrating into and lining the pores with an insoluble material without changing the texture or color of the surface and prevents efflorescence and lime discoloration on the brick.

Uses—For exterior waterproofing stone, stucco, concrete and brick.

Covering Area—For the average surface, 1 gal. will cover 100 to 150 sq. ft. for the first coat and 200 to 250 sq. ft. for the second coat.

Prices and Container Sizes—Shipped in 5, 10, 20, 33, 65-gal. steel drums. Prices range from $1.00 per gal. in 65-gal. steel drums to $1.09 per gal. in 5-gal. drums.

Cosmoproof No. 86 Transparent Concrete Hardener (Colorless)

Cosmoproof No. 86 is guaranteed to give absolute satisfaction, and when applied properly will last upwards of ten years. It makes concrete floors practically as hard as steel, keeps them free from dust, stops disintegration, prevents cracking and preserves them against wear and tear regardless of their use. Cosmoproof No. 86 will withstand traffic and friction perfectly and the original concrete floor will remain protected and intact as long as Cosmoproof No. 86 covers the surface.

Uses—For concrete floors in all industrial plants, apartment houses, institutions and on all concrete surfaces.

Covering Area—One gallon will cover approximately 100 sq. ft.—one coat.

Prices and Container Sizes—Shipped in 5, 10, 20, 33, 65-gal. steel drums. Prices range from 40¢ per gal. in 65-gal. steel drums to 50¢ per gal. in 5-gal. steel drums.

Cosmoproof No. 88 Liquid Integral Antifreeze Concrete Hardener (Colorless)

Renders concrete surfaces waterproof, accelerates the setting of cement and increases the strength of concrete. In winter it acts as an antifreeze in addition to the foregoing qualities.

When Cosmoproof No. 88 is used, the concrete will set in one-fourth to one-half the usual time and will improve its strength. It permits the laying of concrete under all weather conditions as it will set in the coldest weather—in this respect it acts as an antifreeze solution in addition to its waterproofing, dampproofing and accelerating efficiency.

Uses—Cosmoproof No. 88 is used in every form of concrete construction, including foundation walls, cellar bottoms, floors, fireproof concrete walls, concrete roofs, concrete roads and highways, columns, mortar for bricks and tile, concrete vats, water towers, swimming pools, docks, bulkheads, slabs, etc.

Direction for Mixing—Cosmoproof No. 88 is added to the gauging water in the concrete-mix at the rate of 1 qt. per bag of cement, or in other words, 1 gal. will supply the proper efficiency to 1 bbl. of cement.

Prices and Container Sizes—Shipped in 10, 20, 33, 65-gal. steel drums. Prices range from 35¢ per gal. in 65-gal. steel drums to 44¢ per gal. in 10-gal. steel drums.

THE ELATERITE PAINT & MANUFACTURING CO.

Waterproofing and Bonding Materials

DES MOINES, IOWA

EASTERN DISTRIBUTERS

ELATERITE PRODUCTS CORPORATION

NEW YORK, N. Y., 22 East 17th Street—Telephone, ALgonquin 4-9084 BOSTON, MASS., Room 819, 6 Beacon Street—Telephone, Haymarket 3346

PACIFIC COAST DISTRIBUTERS

LOS ANGELES, CAL., Borland-Dorsey Waterproofing Co., 8048 West Third Street—Telephone, Oregon 7407
SAN FRANCISCO, CAL., H. E. Borland, Room 704, 16 California Street—Telephone, Kearney 1142
SEATTLE, WASH., F. T. Crowe Corp., 216 Walker Building—Telephone, Main 7950

AGENCIES IN ALL PRINCIPAL CITIES OF THE UNITED STATES

Products

No. 60, DES MOINES ELATERITE for WATERPROOFING and BONDING; No. 65, DES MOINES ELATERITE for STONE BACKING.

Also manufacturers of Preservative Paints for all classes of surfaces, including Acid and Heat Resisting Paint, and Metal Protective Paint.

DES MOINES ELATERITE

TRADE-MARK

No. 60, Waterproofing and Bonding

No. 60, Des Moines Elaterite, is both a waterproofing and a bonding material. Its base is an intensely adhesive, extremely elastic, non-porous, acid resisting, absolutely waterproof hydro-carbon known as "mineral rubber." It seals the pores of concrete, cement, brick, tile or stone, destroys capillary attraction and provides a continuous film which completely shuts out dampness. In addition, its intensely adhesive quality makes it an ideal bonding material, permitting the direct application to it of plaster or stucco coats.

Applying Plaster Coat Directly to "Des Moines Elaterite" Waterproofing and Bonding Coat

Uses—For waterproofing all brick, stone, concrete and cement surfaces and as an integral waterproofing to be mixed in concrete or cement mortars, plaster, floor and roof toppings and stucco, and for bonding plaster, stucco, tile, linoleums, etc.

Advantages—Intensely adhesive, permanent character; extreme resistance to all acids, preventing disintegration; permanent pliability and elasticity, preventing breaking of the waterproof film from hair cracks or expansion and contraction; smooth liquid character, providing a continuous, rubbery blanket; absolute waterproof character, sealing the surface against passage of dampness; combination of waterproofing and bonding, permitting doing away with lath or furring, economizing room and saving in labor and material costs. It meets every waterproofing requirement, thus there is no need to specify a different material for outside foundations, inside walls, basement floors or bonding or integral waterproofing.

Application—Applied cold, it spreads rapidly with broad flat brushes or may be applied with an air gun or spray. No hot swabbing or layers of felt required and any workman can apply it.

Covering Capacity—100 to 150 sq. ft. (one coat) per gal. or from 80 to 100 sq. ft. (two coats) on cement, brick or stone, depending on porosity; 250 to 300 sq. ft. on wood or metal.

Specifications—***(a) For Waterproofing Substructures***—The waterproofing contractor shall apply a waterproof membrane of No. 60, Waterproofing and Bonding, Des Moines Elaterite, manufactured by THE ELATERITE PAINT & MANUFACTURING Co., Des Moines, Iowa, to the outside of all foundation walls to a point 6 in. above grade, including piers, and to be carried over all footings and properly joined to waterproofing course on outside walls. Membrane to consist of 2 coats properly applied so there shall be no pinholes or uncovered spaces. At least 24 hours must elapse after the application of first coat before applying a heavy second coat, allowing it to dry thoroughly before covering. Walls shall be cleaned thoroughly to remove all loose particles, must be dry and, if of concrete, thoroughly set before applying No. 60, Waterproofing and Bonding, Des Moines Elaterite.

(b) For Dampproofing Interior Walls Which Are to Be Plastered, or for Waterproofing Exterior Walls Which Are to Be Stuccoed—The contractor is to apply 2 coats of No. 60, Waterproofing and Bonding, Des Moines Elaterite, manufactured by THE ELATERITE PAINT & MANUFACTURING Co., Des Moines, Iowa, over the inside surface of all exterior walls which are to be plastered, and outside surface of all walls which are to be stuccoed. The walls are to be clean and dry and the application to be so made that there shall be no pinholes or uncovered spaces. At least 24 hours must elapse between the application of the first and second coat, which is to be a heavy coat.

Plaster is to be applied directly over the coating of No. 60, Des Moines Elaterite, after the second coat is "set" but while it is still "tacky," though not sooner than 3 hours after the second application, nor longer thereafter than 10 days. Stucco is to be applied directly over the coating of No. 60, Des Moines Elaterite, while it is "tacky," but not sooner than three hours after application of the second coat nor longer thereafter than 10 hours.

The waterproofing and bonding coats may be applied with air gun or spray, if contractor prefers.

(c) For Integral Waterproofing Use—All mortar to be made waterproof must have No. 60, Waterproofing and Bonding, Des Moines Elaterite, as manufactured by THE ELATERITE PAINT & MANUFACTURING Co., Des Moines, Iowa, incorporated integrally, proportioned either with the water used for tempering or with the quantity of portland cement used in the batch in the following manner:

If proportioned with the water used for tempering it should be 1 to 8—1 part No. 60, Des Moines Elaterite, to 8 parts water.

If proportioned with the portland cement it should be 1 gal. No. 60, Des Moines Elaterite, to each 1⅔ bags of portland cement used.

The No. 60, Des Moines Elaterite, is to be added to the mixture in the foregoing proportions after the water has been put in for tempering, and the mixing is then to be continued until there is complete and thorough distribution throughout the mixture. It must not be added to the water before the latter has been put in for tempering the mixture.

This specification covers mortars for laying up brick or rubble stone; for stucco; plaster for coating the inside of cellar and other walls; for cement floor and roof toppings; for cement slabs to be spread over cinder fill in roof construction; for concrete not subject to heavy water pressure.

For integral mixture in waterproofing concrete which is subject to heavy water pressure the proportion should be changed to 1 part No. 60, Des Moines Elaterite, to 4 parts water used—1 gal. No. 60 to each 4 gal. of water. The No. 60 to be added after the water has been stirred into the mixture and the stirring continued until there is complete distribution.

No. 65 Stone Backing

Specification — All stone to be coated, before setting, on the five unexposed sides; also entire inner surface, including joints, to be coated after the stone is set with No. 65, Stone Backing, Des Moines Elaterite, as manufactured by THE ELATERITE PAINT & MANUFACTURING Co. of Des Moines, Iowa.

Protecting Stone Facing from Discoloration with "Des Moines Elaterite"

Prices and References

These will be gladly sent on request.

THE FLINTKOTE COMPANY

Waterproofing, Dampproofing and Protective Coatings

BOSTON, MASS.

NEW YORK, N. Y. CHICAGO, ILL. NEW ORLEANS, LA. CINCINNATI, OHIO ATLANTA, GA. DALLAS, TEX.

For Complete Index of Our Other Products, see Manufacturers' Index

FLINTKOTE ASPHALT EMULSIONS

PATENTED

(LIQUID ASPHALT)

Pure Asphalt the Essential Base of Flintkote Products for:

Waterproofing Dampproofing Plaster Bond Protective Coatings
Insulation Protection Roof Coatings Industrial Mastic Flooring

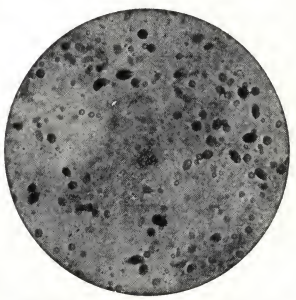
THE FLINTKOTE EMULSION PROCESS

(PATENTED)

Manufactured under U. S. Patent Nos.: 1,506,371; 1,620,899; 1,733,497; 1,734,437; reissue 16,328 and others

How This Process Improves the Mechanical and Weathering Properties of Asphalt and Allows It to Be Applied Cold

The problem of developing a means of depositing a pure asphalt coating that can be used cold has been solved by THE FLINTKOTE COMPANY in its Technical Laboratories. The method, which is the result of years of research, is that of dispersing pure asphalt in water by a process which is so unique and unusual that engineers, chemists and practical men familiar with asphalt have been reluctant to accept the facts, until the process and its results have been fully demonstrated to them. Flintkote Asphalt Emulsion is produced under the Flintkote patents and processes as follows:



Highly Magnified Particles of Flintkote Asphalt Emulsion

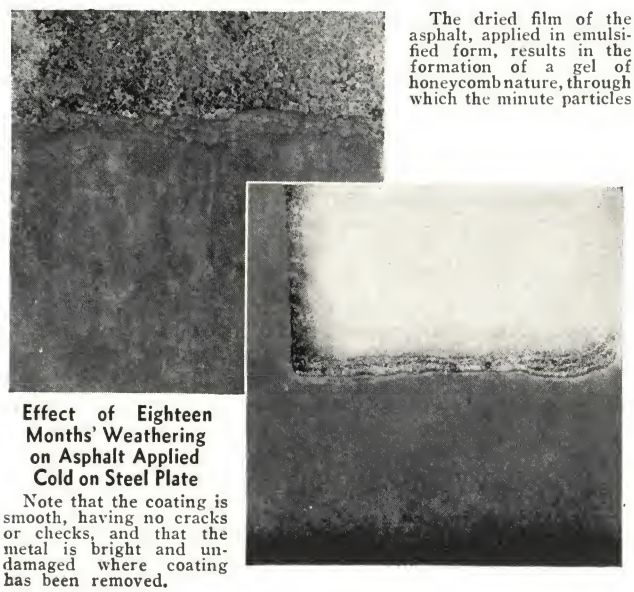
A given pure asphalt is broken up into minute particles (averaging from 1/1000 to 5/10,000 of an inch in diameter) in the presence of water and a definite small percentage of a selected type of inert mineral colloid.

The emulsion thus produced is in continuous suspension until the water vehicle is evaporated.

After the emulsified asphalt is applied, the water vehicle evaporates, the minute particles of asphalt coalesce and the result is a uniform body of the original pure asphalt with all its inherent protective qualities absolutely unimpaired. The emulsification does not affect the quality of elasticity, pliability, ductility and viscosity inherent in the asphalt of which the emulsion is made.

The film, after setting, will not flow at comparatively high temperatures—it remains ductile and flexible at comparatively low temperatures.

The Comparative Effect of Weathering on Flintkote Asphalt Emulsion Applied Cold, and on the Same Asphalt Unemulsified Applied Hot, After Eighteen Months' Exposure



Effect of Eighteen Months' Weathering on Asphalt Applied Cold on Steel Plate

Note that the coating is smooth, having no cracks or checks, and that the metal is bright and undamaged where coating has been removed.

The dried film of the asphalt, applied in emulsified form, results in the formation of a gel of honeycomb nature, through which the minute particles of asphalt coalesce, forming a film, which offers greater resistance to the action of light and weather with greater mechanical strength than hot asphalt.

Effect of Eighteen Months' Weathering on Same Asphalt Applied Hot to Steel Plate

Note that the coating is cracked and "alligatored" and that the plate is rusted under the coating.

ADVANTAGES OF FLINTKOTE ASPHALT EMULSIONS

For Dampproofing, Plaster Bond and Protective Coating

1. Cold Application
2. Greater Lasting Qualities
3. Extreme Resistance to Plastic Flow
4. Greater Mechanical Strength
5. High Degree of Ductility
6. Adhesion to Wet Surfaces
7. Freedom from Odors, Fumes or Gases Capable of Contaminating Foods, Furs, etc.
8. No Fire Hazard in Applying
9. No Trained Workmen Required
10. No Cut-backs Used
11. Plastics or Mastics Readily Applied
12. Will Not Flow Under Heat or Crack at Low Temperatures
13. Combined with Fibres and Fillers, Can Be Used as an Abrasion-resisting Mastic

USES OF SOME OF THE DIFFERENT TYPES OF FLINTKOTE EMULSIONS AND THEIR CHARACTERISTICS

The Flintkote Company manufactures over twenty-five different emulsion products, each suited for a particular type of application or specified use. Wherever conditions to be met demand other characteristics than those found in our twenty-five types of standard emulsions, additional products can be designed to meet particular requirements. The characteristics and uses of a few of our standard products are given below.

C-13-HPC—Heavy Painting Consistency for Dampproofing and Waterproofing and Plaster Bond

An asphalt emulsion of heavy painting consistency without fibres. It is used as a protective coating generally on all types of surfaces; for dampproofing and waterproofing; for plaster bond and similar work. It is not to be used for mastic work, except as a priming coat. This type of emulsion is either sprayed or brushed on.

C-13-A—Heavy Fibred Mastic for Extreme Waterproofing and Insulation Protection

This is a heavy plastic consistency emulsion to which has been added long fibred asbestos. Usually applied with a trowel. This material is used for insulation protection and for pointing up in waterproofing jobs. This mastic should be used only over a priming or bonding coat of C-13-HPC.

C-13-PB—Used As a Combined Dampproofing and Plaster Bond

A quick-drying, high asphalt content emulsion of unusually high adhesive characteristics.

N-13-F—Used for Mastic Floors Combined with Portland Cement and Aggregates

This is an emulsion made from a higher melting point asphalt base combined with special high tensile strength fibre.

Used in the preparation of mastics for flooring according to flooring specification in combination with Portland cement and aggregates.

C-13-F—Used for Mastic for Cork Insulation Protection Combined with Portland Cement and Aggregates

Same as N-13-F, but made from softer asphalt base; suitable for preparation of mastic for cork insulation, according to specification sheets, in combination with Portland cement, sand or other aggregates.

F-13-A—For Heat Insulation Protection Under High Temperature

This is similar to C-13-A, but produced with a higher melting point asphalt base. This is suitable for heat insulation protection where a harder surface is desired at the higher temperatures.

DAMPPROOFING—PLASTERBOND—INTERIOR OF EXTERIOR MASONRY WALLS ABOVE GRADE

(1) Masonry surfaces should be brushed and washed down to remove all traces of dust, dirt, or loose particles. A rough surface presents the greatest bond.

(2) Wet the surface with water before applying dampproofing and bonding course.

(3) Apply a priming coat of C-13-HPC or C-13-PB Emulsion, reduced not over 20% with water, and applied by suitable air spray or hand brush at the rate of 1 gal. per 100 sq. ft.

(4) After drying, apply a second coat of emulsion at the rate of 1½ gal. per 100 sq. ft.

(5) The surface should be dry before plaster is applied.

The above applies to lime and gypsum plaster only, the application of which should be made in accordance with approved specifications for this class of materials.

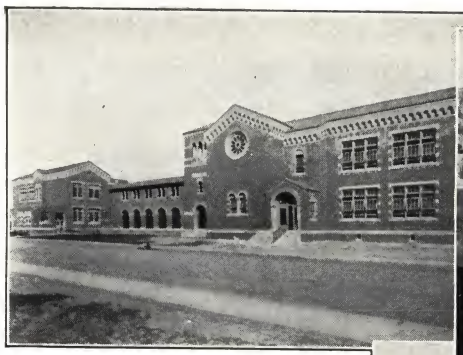
Dampproofing—Concrete Floor Slabs, Concrete Base for Rubber Tile or Linoleum, Parapet Walls, etc.—Complete specifications for these uses will be furnished on request.

PROTECTION OF THERMAL INSULATION AGAINST AIR, MOISTURE, WATER, ABRASION

For Refrigeration Rooms, Refrigeration Compartments, Roof Insulation, Boilers, Steam Lines, Cookers, etc.

Specifications covering the application and the type and quantities of materials required will be furnished upon receipt of complete information covering areas to be protected, range of temperatures to be encountered, insulating material to be used, etc.

A FEW APPLICATIONS OF FLINTKOTE ASPHALT EMULSIONS



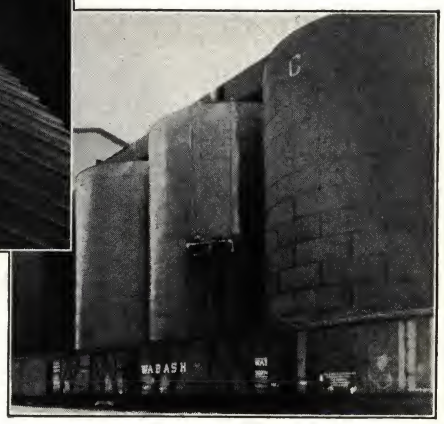
Above:
School in Long Beach, Cal.
Plasterbond of Flintkote Asphalt Emulsion

Above:
Applying Roof Coating of Flintkote Asphalt Emulsion on Factory, Springfield, Mass.

At Top:
Foundation Walls Waterproofed with Flintkote Asphalt Emulsion

Below:
Two Spray Coats of Flintkote Asphalt Emulsion on Tile Roof, Detroit, Mich.

Trowel Applying Flintkote Asphalt Emulsion as a Waterproof Protection Over Insulation



Air Spraying Flintkote Asphalt Emulsion on Steel Storage Bins as a Protective Coating

SPECIFICATIONS FOR PROTECTIVE COATINGS OVER METAL, WOOD OR MASONRY SURFACES AGAINST AIR, MOISTURE OR CORROSION

One of the most important uses of Flintkote Asphalt Emulsion products is as a protective coating for metal, wood or masonry surfaces. Unlike paints, or hot applications of asphalt or other bitumen, dried films of Flintkote Asphalt Emulsions used for this purpose will not sag or flow at elevated temperatures, yet retain their tenacity of bond and protective value at low temperatures.

The elimination of sagging with the resulting cracking and "alligatoring" is of special importance in view of the fact that leading asphalt authorities specify a minimum film thickness of 1/20-in. to obtain the greatest amount of protective value per dollar expended.

Dried Flintkote Asphalt Emulsion films resist the disintegrating and weathering action of ultra violet light, moisture, corroding fumes, acids, etc., and are therefore widely recommended and used where these conditions prevail.

For unusual conditions, specific recommendation will be furnished upon receipt of complete information.

For usual conditions, the following specifications should be used:

Preparation of Surfaces—Usual Conditions—All surfaces to be protected must be thoroughly cleaned of mill scale, rust, dirt, dust, oil or grease. Mill scale can be removed by sandblasting or weathering or by special processes at the point of manufacture. Rust, dust or dirt may be removed by the use of a wire brush and water. Acids, alkalis, or other corrosive materials on the surface to be coated, shall be neutralized by the use of solutions of a character to meet the condition, and the surface then washed free of any subsequent salt or residue by the use of clean water. Films of oil or grease may be removed by wiping with a gasoline moistened cloth.

Specification No. 1—(1) Reduce Flintkote Asphalt Emulsion C-13-HPC not more than 20% with clean, cool water and apply to the surface at the rate of 1½ gals. of undiluted material per 100 sq. ft. and allow to dry.

(2) Reduce Flintkote Asphalt Emulsion C-13-HPC not more than 10% with water and apply at the rate of 3½ gals. of undiluted material per 100 sq. ft.

(3) No protective coating should be applied less than 1/20 in. in thickness, this referring to the dried film.

Specification No. 2—Where Subjected to Continual Action of Water or Alkaline Solutions—(1) Apply priming coat as in paragraph No. 1 above and allow to dry.

(2) Apply the mix described below at the rate of about 4 gal. per 100 sq. ft.

Mix

1 volume screened portland cement (20-40 mesh).
2 volumes of clean water.

Stir thoroughly to a smooth, creamy consistency and pass through a 20-40 mesh screen. To this cement slurry add 5 to 6 volumes of Flintkote Asphalt Emulsion C-13-HPC and stir until of uniform consistency.

FLINTKOTE MEMBRANE WATERPROOFING

The Importance of Waterproofing

The best engineers and architects of the country have given considerable time and attention to the subject of waterproofing and to the best methods under which it can be secured. The need of waterproofing is a most pressing one in almost every modern building, no matter where it is located or its type of construction. This is especially true of foundation work.

Two Types of Waterproofing Systems

The Integral Method—Consists of adding a chemical to the concrete mix which will presumably fill up the pores of the concrete throughout its mass. However, the resulting mass is not elastic and the protection is lost if there are any cracks developed due to expansion, contraction or other movement.

The Membrane System—Differs distinctly from the integral, in that it does not attempt to treat the concrete, but to insulate it from contact with water, by enveloping the structure in a continuous bituminous sheath. This method naturally includes sealing the pores of the outside surfaces so as to prevent the penetration of water, and the establishment of an impervious envelope, completely surrounding the structure. This has as its object the prevention of water from coming in contact with the concrete itself.

An Elastic Waterproofing and Its Advantages

The advantages of the membrane system are:

(1) The materials used are elastic and ductile at all times.

(2) They will not check, crack or peel.

(3) They will withstand all conditions of contraction and expansion frequently met with in ordinary concrete work.

(4) The best membrane construction calls for the use of a built-up waterproofing, which consists of using felts or fabrics of various kinds, embedded and mopped down with pitch or asphalt.

(5) All stages of the application are open to inspection, allowing complete supervision at all times.

Two Bases for Membrane Waterproofing

Membrane systems differ primarily in that they use two separate and distinct classes of materials; those using coal tar and those using asphalt as a binder. It is important that it be borne in mind that coal tar and asphalt differ chemically and physically and cannot be used successfully in combination.

Flintkote Products Are Asphalt Primarily

Flintkote asphaltic products have demonstrated that they will stand up against deterioration induced by heat, weather changes, water, gases, corrosive solutions, frost, cracking and heaving, and other service conditions encountered.

In general, the Flintkote products designed for waterproofing work are divided into these three classes:

Asphaltic coatings and emulsions.

Asphaltic cements and fibrated emulsions.

Asphalt saturated felts and fabrics.

Each of these classes is necessarily subdivided into a variety of different products, each of which is described in detail in this catalogue.

Use of Cold Asphalt Emulsion Versus Hot Asphalt

As explained in the chapters on emulsions on page 1, the Flintkote Cold Application Emulsified Asphalt under many varied conditions will stand up better than the same asphalt not emulsified, but applied hot.

The choice of emulsified asphalt as against hot asphalt will be governed by ease of application on intended surface or by other circumstances surrounding the specific character of the work.

FLINTKOTE MATERIALS FOR WATERPROOFING

Flintkote Waterproofing Felt—A high quality felt, thoroughly saturated and waterproofed with asphalt. It is tough, resilient and flexible. Furnished in two weights: 15 and 30 lb. per 108 sq. ft.

Viskalt Waterproofing Asphalt—A highly tempered asphalt, manufactured so as to resist weathering, and is an absolutely pure bitumen.

Note: Both of these materials are manufactured for waterproofing purposes and meet the specifications of the various standards established.

Flintkote Waterproofing Fabric—A material especially manufactured for waterproofing purposes. It has the following characteristics:

Thread count—warp and filling	26 to 32
Weight untreated	4½ oz. per yd.
Weight treated	12 oz.
Tensile strength	40-65 lb.
Stretch (both directions)	10% minimum

The fabric is manufactured from a 100% pure cotton material, thoroughly saturated with Viskalt Waterproofing Asphalt. Flintkote Saturated Fabric meets the specifications of the American Society for Testing Materials. It is packed in rolls approximately 36 in. wide and containing 50 sq. yd. each; also furnished in larger rolls upon request.

Flintkote Mastic Waterproofing Sheets—A material consisting of two layers of asphalt saturated felt with a heavy body of an asphalt mastic between, all combined to a uniform thickness.

It is manufactured in sheets 3x5 ft. and ¼, ⅜ and ½ in. thick. Can be furnished in sizes other than above if desired.

¼-in. thickness weighs approx. 1½ lb. sq. ft.
⅜-in. thickness weighs approx. 2⅓ lb. sq. ft.
½-in. thickness weighs approx. 3 lb. sq. ft.

Flintkote Safe-T-Plank—Specified for the protection course is an especially prepared product the use of which for this particular purpose has proved very effective.

Flintkote Asphalt Emulsion

The two asphalt emulsions referred to in the table are as follows:

C-13-A Flintkote Asphalt Emulsion—A heavy bodied fibred mastic emulsion for use as trowel coat for extreme waterproofing conditions. See page 2 for complete description.

C-13-HPC Flintkote Asphalt Emulsion—An emulsion of heavy painting consistency for use as a bonding coat; also with membrane for waterproofing. See page 2 for complete description.

WATERPROOFING CHART

The data in this chart on waterproofing was compiled to assist in selecting a suitable specification for the waterproofing conditions under consideration and the recommendations are based on the most satisfactory results obtained in practice.

Hydrostatic conditions				Materials and construction												
				Flintkote asphalt emulsions for cold application						Flintkote hot asphalt and membrane							Protection	
				C-13-A trowel application	C-13-HPC and waterproof membrane		C-13-HPC C-13-A and waterproof membrane			Viskalt and mastic waterproof sheets			Viskalt and rag felt			Viskalt and asphalt saturated cotton fabric	Horiz. surface	Vert. wall
Head in ft.	Pressure in lb. per sq. in.	Lift pressure in lb. per sq. ft. under floor	Wall pressure in lb. per sq. ft. on submerged area														Safe-T-Plank	Pt. cm. mortar 1:2 mix
				Number of plies—layers or courses														
				Single layer	C-13-HPC	Mem.	C-13-HPC	C-13-A	Mem.	Prim-er†	Water-proof	Vis-kalt	Prim-er†	Felt	Vis-kalt	Prim-er†	Mem.	Vis-kalt	Single layer	Single layer
1	0.43	62.5	31.2	Subject to Detailed Specifications						1	(1) ¼"	2	1	2	3	1	1	2	1½	1½
2	0.86	125.0	62.5							1	(1) ¼"	2	1	2	3	1	1	2	1½	1½
3	1.30	187.5	93.7							1	(1) ¼"	2	1	2	3	1	1	2	1½	1½
4	1.73	250.0	125.0							1	(1) ¼"	2	1	2	3	1	2	3	1½	1½
5	2.17	312.5	156.2							1	(1) ¼"	2	1	2	3	1	2	3	1½	1½
6	2.60	375.0	187.5							1	(1) ⅜"	2	1	3	4	1	2	3	1½	2
7	3.01	437.5	218.4							1	(1) ⅜"	2	1	3	4	1	2	3	1½	2
8	3.47	500.0	250.0							1	(1) ⅜"	2	1	3	4	1	2	3	1½	2
9	3.87	562.5	280.8							1	(2) ¼"	3	1	4	5	1	2	3	1½	2
10	4.34	625.0	312.5							1	(2) ¼"	3	1	4	5	1	3	4	2	2½
12	5.21	750.0	375.0							1	(2) ⅜"	3	1	5	6	1	3	4	2	2½
15	6.51	937.5	468.7							1	(2) ⅜"	3	1	5	6	1	3	4	2	2½
20	8.68	1250.0	625.0							1	(2) ½"	3	1	6	7	1	4	5	2	3
25	10.85	1562.5	781.2							1	(2) ½"	3	1	7	8	1	4	5	2	3
30	13.02	1875.0	937.5							1	(3) ⅜"	4	1	9	10	1	4	5	2	4
40	17.36	2500.0	1250.0							1	(3) ⅜"	4	1	10	11	1	6	7	2½	4
60	26.04	3750.0	1875.0							1	(3) ⅜"	4	1	12	13	1	7	8	2½	5
80	34.72	5000.0	2500.0							1	(3) ½"	4	1	14	15	1	8	9	2½	5
100	43.40	6250.0	3125.0							1	(3) ½"	4	1	14	15	1	10	11	2½	6
Recommended for				Underground work Light and medium building construction Bridge piers and abutments						Underground and elevated work Light, medium and heavy building construction Bridge piers and abutments								

†Optional.
For bridge decks and arches—1 primer—3 layers membrane—4 layers Viskalt = Maximum required.
All waterproofing *must* be protected as soon as completed and no finished waterproofing should be left unprotected at end of day's work.
On horizontal surfaces protection should be minimum of 1 in. Safe-T-Plank laid in hot mopping of Viskalt.

WATERPROOFING SPECIFICATIONS BELOW GRADE EXTERIORS

General Instructions and Preparations of Surfaces for Use with Asphalt Emulsion

Flintkote Asphalt Emulsion, since it contains water as a vehicle, bonds effectively to damp surfaces. Old concrete walls, etc., where the surface is dry or dusty, should be wetted down with water and the application made while the wall is still damp.

Spray application is suggested wherever possible by reason of the saving in labor costs, although hand application is equally efficient.

Never attempt to apply any waterproofing material of any kind on interior of exposed walls below grade.

Clean all surfaces (including footings) free of mortar drippings, mud, grease, etc.

All surfaces, except concrete, should be pargeted from footings to grade.

Never apply emulsion on chilled or frozen walls. In cold weather use salamander to take chill out of walls so that temperature of same does not go below 45° F.

Boiling water or steam may be applied to walls, preliminary to coating with emulsion, to remove chill.

Gasoline, kerosene, benzine or oil of any kind shall not be used in diluting emulsion, or in preparing a surface to receive an application of emulsion.

All walls shall be pointed up to satisfaction of dampproofing contractor.

Emulsion shall be thinned, and brushes and spray equipment cleaned, and wetted with clean cool water only, and all moving parts of spray equipment lubricated with soap; lubricating oils should be avoided.

Sufficient space shall be left between outer surface of walls and footings below grade and earth to permit proper application of material.

Specification A for Ordinary Seepage Conditions—(1) From the grade line to a point 1 in. below underside of basement floor, with a reinforcing cove at juncture of footing and wall, the exterior surface of walls and top of footing shall receive a priming coat of Flintkote Emulsion, C-13-HPC, thinned 20% with clean cool water and applied by suitable air spray or hand brush at the rate of 1 to 1½ gal. of emulsion to 100 sq. ft.

(2) Over dried priming coat apply a second coat of C-13-HPC at the rate of 3 gal. of emulsion per 100 sq. ft.

Specification B for Extreme Conditions Against Water Under Pressure—(1) Apply priming coat as outlined in paragraph 1 of Specification "A."

(2) Over dried priming coat, Flintkote Asbestos Emulsion Mortar, C-13-A, shall be troweled to a thickness of ⅛ in. This will require 12 gal. per 100 sq. ft.

Where a head of water exists, a membrane of Flintkote Saturated Fabric shall be placed over the second coat of Flintkote Emulsion, C-13-HPC, or the alternative C-13-A trowel coat, and shall be followed by an additional coat of C-13-HPC applied at the rate of 2 gal. per 100 sq. ft.

The reinforcing cove at the juncture of sidewall and footing shall be made of Flintkote Asphalt Emulsion Mastic suitable for this work.

Individual Specifications—The above represents typical normal application conditions but, where continuous high water pressure exists, it is desirable to formulate individual specifications for the specific conditions to be met. These specifications will be furnished upon receipt of complete information.

THE FIGGE COMPANY

Manufacturers of Figge Wall Gaskets

1617 North Hoyne Avenue
CHICAGO, ILL.

For Figge Roof Flashing, see Manufacturers' Index

Figge Wall Gaskets

Figge Wall Gaskets prevent infiltration of moisture through joints in copings and window sills; also capillary absorption of moisture in masonry placed directly on foundation walls.

Write for literature, samples and price list on our standard type wall gaskets.

Material Used

Figge Wall Gaskets are made from suitable woven cotton fabrics thoroughly saturated and coated with hot, bituminous compound and furnished in following stock sizes:

Standard Type—Made for 8, 12 and 16-in. walls and of sufficient width to cover entire wall including customary mortar joints.

Other sizes and heavy weight gaskets made to order.

Figge Wall Gaskets Are Practical and Efficient

Figge Wall Gaskets will positively eliminate infiltration or absorption of moisture when correctly applied. The material is a durable and efficient waterproofing agent and when placed on top of the uneven masonry, will permit material placed in mortar bed directly on top of same to be keyed in place by reason of flexibility of the gaskets.

Non-corroding metal clips, attached at intervals, center the gasket during application and at the same time provide a drip edge on both sides of masonry, eliminating surface wetting from this source.

Figge Wall Gaskets are made in strips 10 ft. 4 in. long, allowing for lock-lap, and packed 10 strips to a carton, type and width plainly marked on same.

Figge Wall Gaskets Applied by Masons

Being a prepared cotton woven waterproofing material and made in lengths of 10 ft. 4 in. cut to fit various widths of masonry details, it is easily applied by brick masons as work progresses. The end laps are effectively made by simple "lock-lap."

Non-corrosive metal clips, attached at intervals, prevent the gasket from slipping when masonry is being put in place.

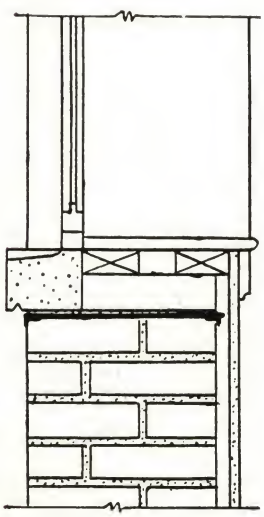
No special construction is required to receive the gasket, nor any special tools for application.

Specifications

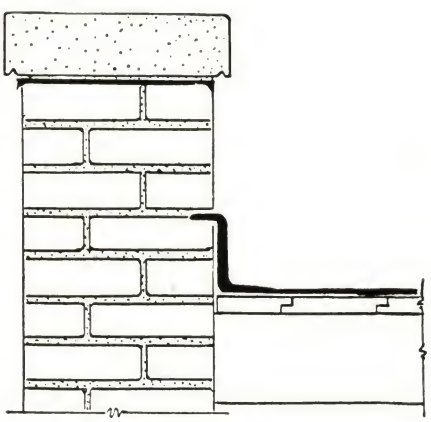
Under masonry or waterproofing specifications use this sub-heading:

Wall Gaskets—The mason contractor shall furnish and apply Figge Standard Wall Gaskets of width required to completely cover all masonry under copings [under window sills] [over foundation walls]. The gaskets shall be applied where directed by architect and in compliance with manufacturer's specifications.

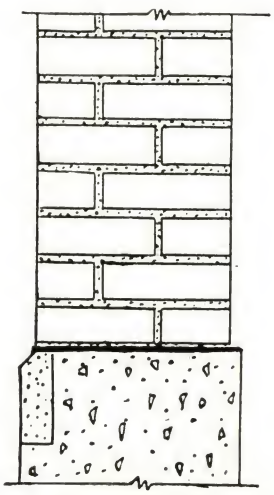
Sold by Leading Material Supply Dealers



Under Window Sills



Over Parapet Walls



Over Foundations

WATERPROOFINGS A HORN PRODUCT FLOOR TREATMENTS

FOR THE CONSERVATION OF BUILDINGS

A.C.Horn Company
WORKS~LABORATORIES~EXECUTIVE OFFICES
Long Island City~New York

Foreword

Do Architects Sell or Buy?

Architects sell. They must accept in good faith the statements of manufacturers. They must hazard their finest asset, reputation, in selling suggestions to their clients. High pressure salesmanship—extravagant claims used as a cloak for high prices and uncertainty—spell trouble and downfall for the architect. Lack of pride in generations of success—lack of financial stability—and lack of extensive and careful laboratory facilities jeopardize the architects' livelihood and prestige.

New or Time-tested?

The third generation of HORN conducts under owner-management the leading business of its kind in America. Pride of quality and tradition permeate the entire national organization. Prestige and not profit, governs production. This is the surest guarantee of enduring quality.

Dun's or Bradstreet's?

The financial rating of the A. C. HORN COMPANY is A-A-A-1. This highest possible credit standing, together with the millions of dollars invested in plants, advertising and valuable trade-marks, demand conservatism. This is the surest guarantee of honest performance.

Research Laboratories or Guesswork?

The staffs of well-known and respected authorities in the HORN Research Laboratories are continually advancing the science of preservation and decoration. Scientific facts have won for the HORN COMPANY its nation-wide acceptance among leading architects. The buying power of carefully supervised mass production assures moderate and standardized selling prices.

The famous stamp

HORN

is the safe guarantee of years of test and usage in thousands of buildings. It is a seal of the integrity of partnership which must exist between architect and manufacturer.

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DETROIT
FORT WORTH
HOUSTON
INDIANAPOLIS
KANSAS CITY
LOS ANGELES

MILWAUKEE
NEW ORLEANS
NEWARK
OAKLAND
PHILADELPHIA
PITTSBURGH
SAN ANTONIO
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SEATTLE
ST. LOUIS
UTICA
WASHINGTON

LONDON
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HONOLULU
MONTREAL
TORONTO

PARIS
BERLIN
SHANGHAI
SYDNEY
TOKIO

A. C. Horn Company
Works, Laboratories, Executive Offices
Long Island City, N. Y.

WATERPROOFINGS — A HORN PRODUCT — FLOOR TREATMENTS

ACHIEVEMENT

The Grand Central Zone of New York is one of . . . if not *the* greatest building accomplishment of all time.

Horn Products have been used wherever there is a yellow dot.

Proven Merit.

Copyright 1932 by A. C. Horn Company

PRODUCTS FOR THE CONSERVATION OF BUILDINGS

A.C. HORN COMPANY, LONG ISLAND CITY, N.Y.

WATERPROOFINGS — A HORN PRODUCT — FLOOR TREATMENTS

FERRO-FAX

Metallic Hardener for Cement Floors

Producing Wearproof, Waterproof and Dustproof Floors

The R. H. Macy Company tests and re-orders prove quality

R. H. Macy Warehouses, New York, N. Y.
Robt. D. Kohn and Associates, Architects
Barney-Ahlers Construction Corporation, General Contractors
1928—300,000 sq. ft. 1930—300,000 sq. ft.

Fifty Million Feet Cannot Be Wrong

Fifty million square feet of Ferro-Fax metallic hardened floors, under every type of traffic, installed over a period of many years, stand today as proof of durability. Metallic hardener has become a commodity rather than a specialty. Its specification is universal. No longer is it a question of "Shall we specify metallic hardener?" but rather "Which metallic hardener shall we use?"

The A. C. Horn Company has developed a cement floor service which is recognized nationally as a leader. Restricted by courtesy and etiquette, no reference may be made to the many interesting comparisons and tests made by the best known testing and concrete institutes, except the modest and respectful statement that the opportunity of such co-operation and confirmation has been deeply appreciated on our part.

Do Metallic Hardeners Differ?

Most decidedly. Metallic aggregates, poorly graded, filled with grinding oils and chips of foreign metals, are being offered as substitutes for Ferro-Fax, at a lesser price. On the other hand, high pressure selling organizations, in order to justify elaborate advertisements, must create an atmosphere of mystery around their materials. Therefore good, plain metallic hardeners are being offered with chatter about strange ingredients and impossible acid-proofings—these claims being a cloak for the high price which expensive merchandising methods make necessary.

A good, clean metallic hardener, manufactured by a company of solid financial worth and good standing, installed over a period of many years of successful usage, is the best test. When measured by this conservative yard-stick of quality, Ferro-Fax leads the field.

Continental Can Company Building, Chicago, Ill.
Francisco & Jacobus, Architects
E. E. Davis Company, Floor Contractors
The Continental Can Company, after using several brands of metallic hardeners, incorporated Ferro-Fax in the floors of their latest plant—a most pleasing tribute to the durability of Ferro-Fax

Western Union Telegraph Company Building, New York, N. Y.
Voorhees, Gmelin and Walker, Architects
Marc Eidlitz & Son, Inc., General Contractors

SPEED SPEC.

The cement floors shall be dustproofed by using Ferro-Fax in accordance with the exact directions of the manufacturer, the A. C. Horn Company, as filed in Sweet's Architectural Catalogues.

A. C. HORN COMPANY, LONG ISLAND CITY, N. Y.

WATERPROOFINGS HORN PRODUCT FLOOR TREATMENTS

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A. C. HORN COMPANY, LONG ISLAND CITY, N. Y.

SPECIFICATIONS FOR FERRO-FAX FLOORS

I. Installation

TOPPING METHOD

For making dustproof, wearproof and waterproof cement finish floors in every type of building, it is recommended that the topping be laid before the base is set whenever practicable.

(a) Proportions of Topping—The topping (thickness at least full ¾ in.) shall consist of the following proportions:

One (1) part tested Portland cement.

Two (2) parts coarse, gritty, clean sand.

(b) Measuring Volumes—These proportions shall be accurately measured by volume in suitable size boxes. No counting by shovels or measuring by wheelbarrows, or other approximation will be permitted.

To determine the proper proportions it is understood that one bag of cement shall be equal to one cubic foot of sand or grits.

(c) Addition of Water—Mix thoroughly dry until uniform in color, showing no streaks or patches of constituents. If mixed by hand topping aggregate shall be turned over dry three times. Add sufficient water to saturate mixture and then mix thoroughly again. The topping shall at no time be made sloppy.

(d) Application of Topping—Lay and straight edge the topping to a true and even surface. Float the surface well with wooden floats to close all voids and hollows.

(e) The Wearproof Finish—A dry mixture of two bags (200 lb.) FERRO-FAX to one bag (100 lb.) tested Portland cement (by weight), mixed to an even color, shall be sprinkled over 600 sq. ft. of surface. This mixture of FERRO-FAX and cement shall be floated in and thoroughly trowelled. The surface shall be given a burnishing trowelling when it has set sufficiently to polish hard and smooth. Under no circumstances shall the wearproof finish be applied when there is any surplus water on the floated surface.

MONOLITHIC METHOD

Recommended for use in warehouses, automobile service stations, factories, foundries, etc.

This specification is recommended for mild weather only.

(a) Preparation—The concrete base or slab shall consist of a mixture of 1:2:4 or 1:2½:5 when gravel is used, and the aggregate shall pass a 1-inch screen. The concrete is deposited between screeds to the finished floor level (on heavy slabs exceeding 6 inches, ⅛ inch allowance must be made for shrinkage) and then screeded thoroughly and tamped with the customary straight edge substantially as a separate mortar finish is smoothed off, leaving no hollows or pockets on the surface.

(b) Preliminary Finish—Immediately following process of leveling off the concrete slab, deposit upon the surface uniformly a dry mixture consisting of:

1 bag FERRO-FAX (100 lb.)

2 bags of standard Portland cement

3 bags of clean, coarse sand.

This dry batch shall be mixed thoroughly and then evenly dusted over approximately 1,000 sq. ft. of surface. This "preliminary finish" will immediately saturate with the surplus water remaining on the surface and shall then be thoroughly floated into the concrete with heavy wooden floats, but do not steel trowel.

(c) Hard Finish—Then a dry mixture of two bags (200 lb.) FERRO-FAX and one bag (100 lb.) standard Portland cement shall be evenly distributed over each 1,000 sq. ft. of floated surface. This dust coat shall be floated in with wooden floats and followed immediately with a steel trowelling. The floor shall be given a second steel trowelling after the surplus water has disappeared. The finished surface must be free from depressions and shall present a smooth and even texture.

II. Safeguarding the Floor

Do not wet the new cement floor surface until it is 48 hours old. After the topping has set up 48 hours, the contractor shall cover it with a uniform layer of soft wood sawdust, shavings, or other suitable covering. This covering must not be applied until experiment shows surface hard enough to prevent covering from scratching or injuring the finish. Surface shall be kept wet for at least five days. Floors, if protected as above, will be ready for light traffic in a week, and heavy traffic in three weeks, under favorable weather conditions.

As an alternate to this protection and wetting, the floors may be cured under Horn's MAT-O-HORN.

Glaze interior surfaces by applying one coat of Horn's Transparent KONKREX.

Quantities of Ferro-Fax Required

The foregoing is the standard method of procedure for the average building. The 30 lb. of FERRO-FAX recommended per one hundred (100) square feet will give a surface which will withstand any average service. However, there are some cases where the quantities should be varied. These exceptions follow:

(a) For floors which receive extremely heavy wear, use 35 lb. of FERRO-FAX to every one hundred (100) square feet instead of 30 lb. for the wearproof finish.

(b) For loading platforms, railroad repair shops, forge shops, piers, etc., use 40 lb. of FERRO-FAX to every one hundred (100) square feet instead of 30 lb. for the wearproof finish.

KONCREX

Dustproof, Decorative Wearing Surface for New or Old Cement Floors

Floor Surfaces Treated in 1914
Still in Good Condition

Equitable Building, 120 Broadway,
New York, N. Y.

Protection of Cement Floors

KONCREX is more than a cement floor paint. For more than a generation, KONCREX has been recognized as solving this problem of indoor cement floor protection.

This liquid coating penetrates the topping to a certain extent, binding the surface particles together and providing a wearing finish.

Unlike ordinary coatings, KONCREX is unaffected by the destructive alkaline reaction of cement and retards the absorption of stains, oils and greases. It is extremely resistant to traffic and maintains the fine appearance of the floor. The coating is easily cleaned.

KONCREX is produced in colors and in the transparent.

The long, successful record of KONCREX, as attested by millions of square feet of floors in thousands of office buildings, hospitals, hotels, schools and other structures of every description, has thoroughly established its reputation as a most desirable decorative floor coating possible to obtain.

Two coats of KONCREX are recommended. In new office buildings, it is customary to apply one coat of Transparent KONCREX to all cement floors, preventing dusting and improving the appearance of the floors; afterward applying the standard KONCREX colors to meet the requirements of tenants. One coat of Transparent KONCREX containing 5% of Bluestone Grey KONCREX is often used on floors to be covered with linoleum. This presents a finished surface during the six months that linoleum must be kept off the uncured floors to prevent glue rot.

All cement floors in contact with earth, to which KONCREX is to be applied, must be waterproofed. Very soft floors may be treated advantageously with HORNSTONE CRYSTALS before KONCREX is applied.

403
Bluestone Grey

409
Brown Stone

Covering Capacity
KONCREX covers from 160 to 200 sq. ft. per gallon, two coats

Shipping Data
KONCREX is shipped in barrels, half-barrels, 5-gallon steel pails and 1-gallon cans

407
Mosaic Green

402
Tile Red

Directions for Use

(1) Curing—Cement floors shall be allowed to cure thoroughly before KONCREX is applied.

(2) Cleaning—Floors shall be dry and clean; all plaster, dirt and grease being removed before the KONCREX is applied.

(3) Application—KONCREX must be well stirred before using. Containers must be kept covered when not in use.

KONCREX shall be applied in two coats. Brush out each coat well. Allow no pools to form in low spots. Twenty-four hours to elapse between coats.

On a dense floor thin first coat with one pint turpentine to each gallon of KONCREX. Apply second coat without thinning.

Do not expose to traffic for at least 48 hours after application.

408
Dust

401
Cement Grey

SPEED SPEC.

When cement floors are thoroughly cured and cleaned, two coats of KONCREX shall be applied in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

WATERPROOFINGS — A HORN PRODUCT — FLOOR TREATMENTS

HORNSTONE CRYSTALS

The Chemical Treatment for Producing Dustproof Cement Floors

Easily applied at low cost, producing a hard, dense, insoluble, dustproof and permanently wearing surface, highly resistant to traffic and chemical disintegration.

(1) Dusty cement floors are unnecessary, unsanitary and costly.

(2) They can be rendered flint-like and impervious to wear by simply washing with HORNSTONE CRYSTALS.

(3) It is unnecessary to tie up traffic for more than one hour, while treating the cement floors to render them dustproof.

(4) Dirt in machinery bearings, ruts in the floors, dust on shelves of merchandise, are due to dusty cement floors—all easily prevented with HORNSTONE CRYSTALS.

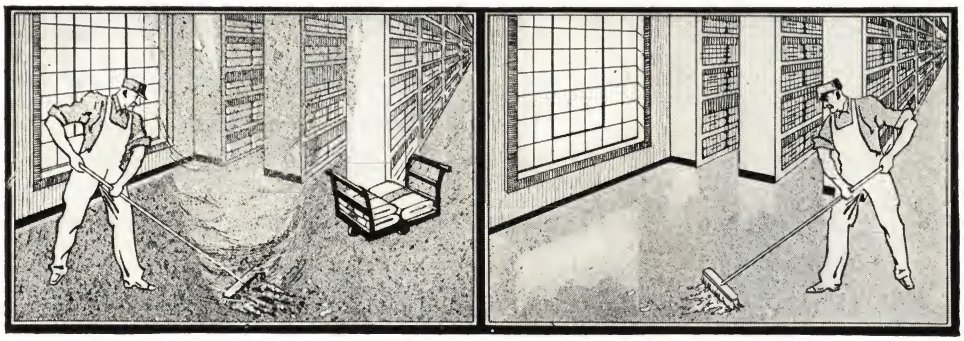
The positive, time-tested remedy adopted internationally to cure cement floors of their inherent weaknesses.

Microphotograph of Floor Before Treatment

HORNSTONE CRYSTALS are of a complex, mineral salt composition. Dissolved in water and simply flushed over the floor with a mop or broom, they soak into the concrete, with which they react chemically, filling the voids and producing hard, dense, permanent wearing surfaces, which will not dust.

HORNSTONE CRYSTALS do not produce a surface film, but penetrate the concrete. The depth of penetration varies in different floors. A hard and dense floor requires less penetration and less HORNSTONE for maximum strength. A soft, porous floor allows greater penetration and requires more HORNSTONE CRYSTALS to produce an efficient result.

Microphotograph of Floor After Treatment



Before Treatment **After Treatment**

Standard Specifications

The cement surfaces to be treated shall be clean and free from dust, dirt, and stains. The floors shall be treated with a sufficient number of coats to saturate the surface. Saturation will be denoted by the appearance of a slight white discoloration after the floor is dry.

1st Application—Dissolve one-half pound (½ lb.) of HORNSTONE CRYSTALS in 1 gallon of water and apply freely—brooming around with a soft floor brush or corn broom.

Secondary Applications—Dissolve two pounds (2 lb.) of HORNSTONE CRYSTALS in 1 gallon of water and apply when first application is dry. Use a soft floor broom or a rubber squeegee to brush puddles on to high spots. All surfaces should remain soaking wet for at least two minutes.

Covering Capacity

On average floor covering capacity is approximately two pounds (2 lb.) HORNSTONE CRYSTALS per one hundred (100) square feet.

Shipping Data

HORNSTONE CRYSTALS are packed in 100 lb. kegs and in 14 lb. cartons.

SPEED SPEC.

All cement floors shall be saturated with HORNSTONE CRYSTALS in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

KERAMIK

Beauty and Durability of Tile for Cement Floors Already Installed

KERAMIK

A color penetrant for concrete surfaces. KERAMIK reacts chemically with the lime content in Portland cement. It imparts beautiful, variegated colors in greens and browns. The A. C. HORN COMPANY supplies expert workmen to score the floors mechanically and apply KERAMIK.

Send for our elaborate catalogue on KERAMIK.

A. C. HORN COMPANY, LONG ISLAND CITY, N.Y.

WATERPROOFINGS A HORN PRODUCT FLOOR TREATMENTS

DEHYDRATINE NO. 80

Dustproof Commercial Floors—Fatty Fast Setting Brick Mortar

Double the Strength in Half the Time

Premature traffic ruins ordinary floors and stairs. DEHYDRATINE No. 80 gives adult strength to youthful surfaces.

With DEHYDRATINE No. 80 speed with safety can be accomplished in brick laying. Joints can be struck sooner, mortar drippage avoided and more courses of brick laid per day by adding this clever liquid to the mortar in mixing. Summer conditions may be had on cold weather brick work by varying quantities of DEHYDRATINE No. 80 to suit temperatures.

Conclusive tests by a prominent university (on file in our laboratories) show that DEHYDRATINE No. 80 develops both an initial and final set in the standard brands of Portland cement, in less than one-half the ordinary time. Simultaneously, DEHYDRATINE No. 80 is proven nearly to double the compressive strength at the end of one day, thereby justifying the claim of seven days' strength at the end of the first day.

A Nationally Known Builder Builds for Himself

Fuller Building, New York, N. Y.

WALKER & GILLETTE, Architects
GEO. A. FULLER CO., General Contractors

The Geo. A. Fuller Company, nationally known builders, with their wealth of experience in every product of competitive value, selected DEHYDRATINE No. 80 for their own office building—a most pleasing tribute to Horn's material

Causes for Increased Strength Are:

(1) It reduces the amount of water used. (See Duff Abrams on effect of water content.)

(2) More completely hydrates the Portland cement by reducing the surface tension of the water and giving a quicker saturation of the cement and sand particles.

(3) Formation of new cementitious material, the oxychlorides.

Tests conducted by the U.S. Bureau of Standards, as the result of investigations made for the U. S. Engineers' Office at Memphis, Tenn., resulted in the conclusion that DEHYDRATINE No. 80 composition accelerated the rate of increase in strength of cement mortar.

Cheaper "In" Than "Out"

Because

(1) Hastens the setting of cement mortar for floor and brick work, saving labor costs.

(2) Produces in 24 hours a result having the strength of a seven-day untreated mortar.

(3) Acts as an anti-freeze—a precaution and protection in freezing weather.

(4) Hardens cement floors throughout, producing dust-free cement floors and making possible a high polish.

(5) Lubricates concrete, causing it to "spade" and "chute" more easily by increasing the plasticity, making it "flow" readily around reinforcement.

(6) Makes cement mortar "fatty" and smooth.

(7) Increases the bond in stone and brick masonry.

Directions for Use

A one-inch floor topping shall be installed, composed of one part standard Portland cement and two parts clean coarse sand. To the mixing water shall be added DEHYDRATINE No. 80 as manufactured by the A. C. HORN COMPANY, in the proportion of one gallon for each barrel (4 bags) of cement. Pour, straight-edge, float and steel trowel in the usual manner. A second polishing trowelling shall be given when surface has set sufficiently to finish hard and smooth. Protect surface from traffic and keep wet down for ten days.

For brick mortar use from one quart to one gallon of DEHYDRATINE No. 80 to each ten gallons of mixing water, depending upon speed of set desired.

For Estimating—***Floors***—One gallon DEHYDRATINE No. 80 per one hundred square feet of one-inch topping.

Brick Work—From two quarts to one gallon of DEHYDRATINE No. 80 per thousand bricks.

Shipping Data

Shipping weight 11 lb. per gallon. Packed in 55-gallon steel drums; half-drums (30 gallons); and 5-gallon pails.

SPEED SPEC.

Cement floors and mortar shall contain DEHYDRATINE No. 80 in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

A. C. HORN COMPANY, LONG ISLAND CITY, N. Y.

WATERPROOFINGS HORN PRODUCT FLOOR TREATMENTS

WOODCREX

Wood Floor Preservative

Prevents Wear and Discoloration of Wood Floors (Maple)

This is a pale, amber-colored liquid containing various gums and resins, which, when applied to wood floors, penetrates to a considerable depth, filling the pores of the wood with a resinous material which replaces the sap lost in kiln drying, and thus restores the wood to its former resilient condition. These gums, filling and setting in the pores, toughen the floor against the splintering shocks of traffic and exclude moisture and dirt. A Woodcrexed floor retains its natural beauty of grain and color.

Woodcrex is quick drying, it being possible, under average conditions, to open the floor to traffic within 24 hours after application.

Average Covering Capacity—*On Maple—One Heavy Flowed-on Application*—250 sq. ft. per gallon; 200 sq. ft. per gallon when dipped.

Shipping Data—Average weight 8 lb. per gallon. Packed in drums; half-drums; fives and ones.

KOPPER KARBOL

To Check Dry Rot—As a Wood Preservative

A solution of copper and creosote combined by our own process into a compound of highly penetrative and preservative value. The wood is completely preserved not only against the destruction by insects, but its most dangerous enemy—dry rot. It will protect wood from dampness, check further advance of decay that has begun, and will resist the growth of fungi or other parasites that hasten decay.

Kopper Karbol may be applied either cold or at a temperature of 150 degrees Fahrenheit; it may be applied by a brush, or by spraying or dipping.

Covering Capacity—*Rough Lumber*—200 sq. ft. per gallon. *Shingles*—One gallon will dip and afterwards brush 350 shingles.

Shipping Data—10 lb. per gallon. Packed in drums; half-drums; fives and ones.

BONDSIT

An Aid in Bonding Old and New Concrete

A granulated compound for use in bonding the topping of cement floors after the rough concrete has been placed; bonding plaster or stucco to concrete or cement surfaces; for making watertight joints in (a) waterproof construction, and (b) the construction joints caused by the end of the day's work or by temporary delays in securing labor or materials. Bondsit prepares the old surface by removing the laitance; increases the strength of the bond by at least 15%, which is sufficient for all needs.

Two pounds in solution will treat approximately 150 sq. ft. of surface.

Packed in jars of 5 lb. each, 6 jars to the case.

NO-FREEZE

Summer Speed on Winter Work

A rectified solution of maximum strength having a specific gravity of 32 degrees Baumé. Increases the rate of hydration of Portland cement mixtures, thereby developing heat by chemical reaction and lowering the freezing point. It also lowers the freezing point of the water, making possible the pouring of concrete, laying of brick in cement mortar, and the laying of cement floors in winter time.

Guaranteed not to reduce the strength of the concrete.

Mixed with the gauging water in the following proportions:

Anticipated temperature, deg. Fahr.	No-Freeze, gal.	Water, gal.
32	1	15
28	1	12
23½	1	9
22	1	8

Shipping Weight—11 lb. per gallon. Packed in drums; half-drums; fives and ones.

BAR-X

X-Ray Proof Floors and Walls

Bar-X is a dry compound which, when incorporated in cement floors as well as ceiling and wall plaster, absorbs the destructive X-ray, preventing injury to persons in adjoining rooms. Bar-X functions more efficiently than barium salts or barium sands in the construction of X-ray rooms.

Made standard by leading hospital authorities.

Packed in bags of ½ cu. ft. (75 lb.). Used in the following proportions:

For Cement Floors—1 cu. ft. (2 bags) Bar-X; 1 cu. ft. (1 bag) cement; 2 cu. ft. sand.

For Wall Plaster—One cu. ft. (2 bags) Bar-X; 2 cu. ft. wall plaster. These proportions to be used through all coats.

Send for special BAR-X data sheet

A. C. HORN COMPANY, LONG ISLAND CITY, N. Y.

STAYBRITE

WATERPROOFING DRY COLORS

2 in 1

For Brick Mortar, Stucco, Cove Base, Floors, etc.

Why Unstable Mortar Colors Fail

(1) Unstable colors add to the formation of efflorescence. The porous, leaky mortar admits driving rains. The water dissolves the salts present and evaporation deposits an unsightly discoloration on the outer face. This white film hides or masks the color in the joint.

(2) They contain excessive inert and organic impurities. These weaken the mortar and cause disintegration plus leakage.

(3) They fade due to sunlight and action of the alkali in cement.

(4) Such colors have low tinctorial power. They require too many pounds per bag of cement. This results in high cost, leakage, efflorescence, disintegration and loss of color.

Why Staybrite Functions

(1) STAYBRITE waterproofs as well as colors. This tends to prevent efflorescence, which is caused by porous, leaky mortar. The elimination of efflorescence prevents the hiding or masking of the color. Horn's famous waterproofing is ground into STAYBRITE at the factory in exactly correct proportions. The necessity of specifying or using additional waterproofing is thereby eliminated.

(2) STAYBRITE contains only pure high-grade metallic oxides, free from impurities and fillers.

(3) STAYBRITE is unaffected by the actinic rays of sunlight, and is impervious to chemical reactions prevalent in cement and lime mortars.

(4) STAYBRITE has the highest of tinctorial strength because of its pure concentration. Economy is gained by the small quantities required per bag of cement. The results are—low cost, no weakening or leakage of mortar, no efflorescence or loss of color.

Staybrite Is the Flag of Color in the Mortar Which Assures the Architect that Waterproofing in the Proper Proportion Is Present. Staybrite Comes Packed in Paper Bags Containing the Exact Quantity Required per Bag of Cement. No Weighing or Measuring Necessary

TO WATERPROOF AND MATCH THESE COLORS IN 1:3 MORTAR USE PER BAG OF CEMENT OR LIME:*

2 lb.	*8 lb.*	*5 lb.*	*5 lb.*	*5 lb.*	*5 lb.*	*5 lb.*
Japanese Black	Tile Red	Egyptian Green	Persian Yellow	Linoleum Brown	China Blue	Alaskan Brown

*To deepen colors for Floor Work (1:2 topping) use double the above quantities per bag of cement, except Tile Red and Japanese Black, which shall be 8 lb. and 2 lb. respectively.

Directions for Use

Each batch must contain the same proportions of cement, sand and STAYBRITE COLOR, which should be thoroughly mixed dry until the entire mass presents a uniform color, showing no streaks. The gauging water shall then be added in the smallest quantities that will produce a stiff workable mixture.

Mechanical mixing shall be done by a batch mixer only. The use of "continuous" type mixers should not be permitted, if uniformity of color is desired.

When mixing is done by hand, spread out half of the cement in a layer in the mixing box. Sprinkle STAYBRITE COLOR over it and cover with balance of cement. Mix thoroughly and add the sand, turning the mass over until the mass presents a uniform appearance. Add the water sparingly as above directed by pouring into a well-shaped depression made in the mass and hoe thoroughly until a uniform color and consistency is obtained.

SPEED SPEC.

All brick mortar, stucco, and colored cement floor base are to be colored and waterproofed by using STAYBRITE as manufactured by the A. C. HORN COMPANY and of a color to be selected by the architect.

WATERPROOFINGS — A HORN PRODUCT — FLOOR TREATMENTS

MAT-O-HORN

The Non-tearing Waterproof Tarpaulin

Modern Curing and Protection for Cement Floors

Until recently, it has been customary to specify that "the finished cement floors shall be covered with sawdust or sand and kept wet for two weeks." An admittedly inefficient and unsatisfactory procedure—particularly in the case of colored cement work which becomes badly stained and disfigured from plaster droppings and construction traffic.

Today, in the modern building, the floors immediately after installation are covered with MAT-O-HORN, *the non-tearing waterproof tarpaulin.* Under this protective airtight covering the cement work "sweats" for two weeks and cures under damp conditions without the necessity of wetting down. The usual building traffic will not mar or stain the surface protected by the tough MAT-O-HORN—which is kept in place until completion of the building. The cost of this method is no more than that of sand or sawdust protection and far more effective.

MAT-O-HORN consists of a strong woven fabric saturated with asphalt and faced on each side with a non-staining tough membrane. MAT-O-HORN has a thousand uses besides the curing of cement—such as enclosing winter work, blocking openings, covering work and material—in fact, wherever ordinary canvas "tarps" formerly were used.

MAT-O-HORN comes in a form convenient for handling, and is priced not for profit, but for service to Horn customers.

OMIT SAWDUST CURING—MAT-O-HORN COSTS LESS

GLAZING CEMENT FLOORS

The Biggest of Buildings Serviced by Horn

The Merchandise Mart, Chicago, Ill.

Greatly annoyed by laitance, upon moving into this wonderful structure, the Marshall Field Co. sent for Horn Floor Service experts. A pleasing tribute to Horn leadership and today a satisfactory job

A new term, coined to describe the remedy produced by the Horn laboratories to cure the initial dusting of cement floors. Any well laid floor, whether a hardener or color has been used, will, because of the floating and trowelling of its surface, present a thin film of laitance or "glut" which must wear off before the true, permanently dustproof surface is revealed. Because this wearing off, or initial dusting, takes place during the first few months while the owner is moving in, the architect is often unfairly criticized for poor floors.

The remedy is simple and of very low cost. Apply a single coating of HORNITE or Transparent KONCREX, to the clean, dry floor after it has cured. This binds the soft film of laitance together, causing it to polish off slowly instead of dusting off. If the life of a cement floor surface is started by a polishing action instead of a gritty, disintegrating dusting, a dense finish is immediately developed and porosity avoided.

In sweeping a cement floor which has been glazed, the bristles of the broom slide smoothly over the polished surface—instead of catching in the pores of an unglazed surface. Thus is avoided the flicking of the dust and dirt into the air to settle back upon merchandise and machinery.

Directions

Do not cure floors by using wet sawdust or sand. Cover finished floor surface with MAT-O-HORN tarpaulin the day after trowelling. Do not wet down the floors, either before or after covering with MAT-O-HORN. Upon completion of all plastering, painting and cleaning down of building, remove MAT-O-HORN covering, allow floors to thoroughly dry and apply one coat of Transparent KONCREX or HORNITE No. 61 to the clean, stain-free surface.

CURE AND PROTECT THE MODERN WAY

SPEED SPEC.

All finished cement floors shall be cured by covering within twenty hours after installation with MAT-O-HORN, which shall be left in place until completion of the building. Upon removal of the MAT-O-HORN, the cement surfaces shall be glazed with one coat of Transparent KONCREX or HORNITE No. 61 in accordance with the directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

A. C. HORN COMPANY, LONG ISLAND CITY, N. Y.

WATERPROOFINGS — A HORN PRODUCT — FLOOR TREATMENTS

COLORUNDUM

Beauty and Durability of Tile at Cement Floor Prices

Non-Fading—Non-Slip

COLORUNDUM forms a colored armorplate integrally with the cement finish, similar to that of ceramic tile in thickness and quite comparable in beauty and durability.

The constant repetition of the cry for tile beauty when only cement floors could be afforded, forced the Horn laboratories to evolve this remarkable material.

COLORUNDUM is a dry powder, composed of powerful coloring mediums, fused aggregates, waterproofing and hardening elements plus cementitious binders. It is used exactly as it comes from its container and permits the foolproof application of a dust-coat floated and trowelled into the topping.

Outdoors or indoors, COLORUNDUM stands the time test. It is fadeproof, limeproof, waterproof and dustproof. Its tough integral thickness is wearproof.

Unstable colors have proven most inefficient in cement floors. They fade, soften the cement and dust badly. Unstable integral paste colorings have also proven unsatisfactory, as they crack and check the floor surface, fade out and require constant oiling or waxing.

To fuse a tile finish over the cement floors would be ideal. COLORUNDUM may be said to accomplish that result through its clever composition.

The non-slip, dense surface of COLORUNDUM makes it an ideal flooring for school corridors, auditoriums, stores, showrooms, sidewalks and ramps. Its beauty makes it applicable in every type of structure, from the modest cottage veranda to the monumental edifice.

Price

COLORUNDUM, because of its large volume of sales, is manufactured in quantity production, enabling the price to compare with that of a painted cement floor, while its immaculate finish is comparable in permanency and beauty to tile floors.

All colors priced the same.

Pennsylvania R. R. Suburban Station, Philadelphia, Pa.

Black

Retail Salesroom

Tile Red

HORN SCORING METHOD

Through the development of mechanical grinding of joints with abrasive wheels, COLORUNDUM floors may today be scored into 8-in., 12-in. or any sized tiles or random and ashlar design at half the cost of the old-fashioned hand method joining. Ground joints will sweep dust-free and exactly reproduce tile mortar joints.

Brown

A. C. HORN COMPANY, LONG ISLAND CITY, N.Y.

COLORUNDUM

Specifications

A. Topping Method

Straight-edge a one-inch topping, composed of one part Portland cement, two parts clean, coarse sand, to finish floor level. When water has disappeared from the surface and topping has set sufficiently to hold up knee boards, dust on dry COLORUNDUM exactly as it comes from the container, in the proportion of twenty pounds per hundred square feet of floor surface. Wood float this dust coat thoroughly into the floor, but do not steel trowel. Then apply a second dust coat of dry COLORUNDUM in the proportion of ten pounds per hundred square feet. Wood float and steel trowel. When set sufficiently to take a hard burnishing, give the floor a final polishing steel trowelling. At the end of twenty-four hours, cover the floor with Horn's MAT-O-HORN, the reinforced paper-fabric tarpaulin, and protect from traffic for one week.

B. Monolithic Method

Straight-edge the concrete, composed of one part cement, two parts sand, four parts stone, to finish floor level. When surplus water has disappeared, dust on a dry mixture of one part cement and two parts sand, in the proportion of fifty pounds of mixture per one hundred square feet. Float this into the surface with a long wooden darby, but do not steel trowel. When surface has set sufficiently to hold up knee boards, dust on dry COLORUNDUM in the proportion of twenty pounds per hundred square feet. Wood float thoroughly, but do not steel trowel. Apply a second dust coat of dry COLORUNDUM in the proportion of ten pounds per hundred square feet. Wood float and steel trowel. Give final burnishing steel troweling when set sufficiently to finish hard and smooth. After twenty-four hours cover with Horn's MAT-O-HORN, the reinforced paper-fabric tarpaulin, and protect from traffic for one week.

C. Duo-tone Variegated Effects

Beautiful mottlings or blended Duo-tones may be obtained by using a different color of COLORUNDUM in the second dust coat. Do not wood float second dust coat in this case, but pat in and steel trowel.

D. Walls

Where COLORUNDUM is specified for vertical surfaces, it shall be applied as a finish-plaster coat. The ground coat shall be thoroughly bonded, put on one-half inch thick and scratched. Ground coat shall be composed of one part Portland cement and three parts sand. The final plaster coat (similar to the white-coat in lime plaster work) shall be composed of COLORUNDUM exactly as it comes from the container, with only water added to make a thick paste. This shall be applied not less than one-sixteenth inch thick and not more than twenty-four hours after the ground coat. Give the finish plaster coat a hard, dense trowelling. Spray the walls each day for one week.

E. Interior Work

To deepen color or to obtain a waxed finish, the COLORUNDUM surfaces may be given a coating of Horn's DEVELOPER AND SURFACER, after they are cured and dry. Efflorescence should be first dry brushed off.

Automobile Show Room

F. Exterior Work

All COLORUNDUM surfaces shall be dry scrubbed to remove film of efflorescence or laitance, if any appears. To deepen color, apply one coat of Horn's DEHYDRATINE No. 2, after curing and drying.

G. Jointing

Forty-eight hours after installation, the COLORUNDUM topping shall be scored into twelve-inch tiles, unless otherwise required, using the Horn Method of a power-driven abrasive wheel. Joints shall be true and straight, one-quarter inch wide and one-sixteenth inch deep. At the time the topping is laid blind joints shall be installed each way every four feet, cutting through the topping with a small pointed trowel and trowelling over smooth. Scored joints shall be over the blind joints.

Sidewalk

Quantities Required

Floors require thirty (30) pounds of COLORUNDUM per one hundred (100) square feet.

Walls require fifty (50) pounds of COLORUNDUM per one hundred (100) square feet.

Shipping Data

COLORUNDUM is packed in one hundred (100) pound metal containers only.

SPEED SPEC.

The cement floor shall be finished in accordance with the A. C. HORN COMPANY'S COLORUNDUM Method, as filed in SWEET'S ARCHITECTURAL CATALOGUE; of a color to be selected by the architect and scored as directed.

French Grey

Green

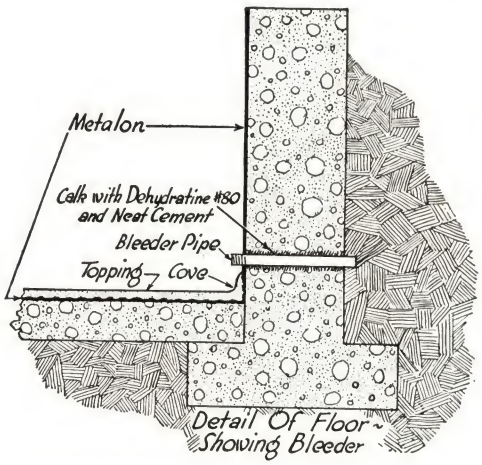
METALON

Horn's Iron Method

For Inside Waterproofing of Concrete and Brick Walls

Although general waterproofing practice has been to waterproof structures on the water side, or at the point of contact of the water, repeated requests for a material to be applied *to the inside* of exterior walls on structures already built have mothered the development of METALON—*Horn's Iron Method* of waterproofing. Many years of results have been very successful.

METALON may be applied to concrete, brick, cement block or similar masonry surfaces. Five or six coats of METALON are required to insure against pressure.



Where pressure is encountered, the floor must be treated as well as the walls. When the operation is completed it will be necessary to protect the iron membrane on the floor with the usual topping of cement. At the junction of the wall and floor sufficient material of each mixture must be applied to provide a cove joining the wall and floor.

The finished surface will present a reddish brown appearance which may be decorated by one application of A. C. HORN COMPANY'S HORNROCK or a wash of Portland cement and water.

Directions for Use of METALON

(1) Clean and roughen all surfaces thoroughly, making them free from laitance and other foreign matter, by scraping all loose material off and wire brushing if necessary. Cut out all cracks and openings to a depth of one inch and fill with a stiff mortar made with DEHYDRATINE No. 80 and Portland cement (no water or sand to be used in this mixture). This is essential where heavy pressures are encountered.

(2) Wet the entire surface to be waterproofed, using a four-inch brush for applying the water (under no circumstances apply METALON to a dry surface).

(3) Apply not less than five coats of METALON, using a four-inch paint brush.

(4) Never make up more material than can be used in thirty minutes.

(5) Make METALON coating for first coat as follows:

Add METALON to water slowly, constantly stirring to the consistency of heavy cream. Keep constantly stirred and apply with a stiff brush to the wet wall. The material should be well rubbed in, with a rotary motion, to insure entrance of the fine material into the pores of the surface. Allow to become thoroughly dry until wall has assumed reddish brown color. No cement is to be used with METALON for first coat. The first coat should be gently dampened at intervals, commencing about two hours after application, preferably by the use of an insecticide spray.

(6) For second coat, use equal parts of METALON and Portland cement. Mix and apply as before, wetting down at intervals as for first coat. For second and later coats, a four-inch paint brush should be used.

(7) For third coat, use equal parts of METALON and cement. Mix and apply as before.

(8) For fourth and fifth coats, use mixture same as for second coat. Surface can then be given cement wash if desired, using Portland cement and water, or HORNROCK, furnished in colors if desired, as manufactured by the A. C. HORN COMPANY.

(9) Always wet the surface over which each is to be applied and *always keep the mixture stirred* and to the consistency of heavy cream, adding water as soon as the mixture heavies up.

(10) Over floor surfaces use the same mixture and the same procedure but never permit puddles of water to accumulate in wetting the floor—the water should always be spread out before application is begun. Install a new cement topping to protect METALON coatings. Topping should be one inch thick laid over two inches of concrete and run up on walls in a cove base. If floors are only cracked, cut out cracks one-half inch wide and one inch deep, slush all sides of cracks with grout coat of one part METALON, one part cement and sufficient water to make a thin cream. While slush coat is still wet, fill in cracks with a mixture of one part METALON, one part sand and one part Portland cement mixed with water to a stiff putty. Trowel smooth. After setting, cover cracks with wet burlap bags for one week.

(11) Every coat of METALON must be allowed sufficient time to become rusty, before a succeeding coat is applied. Keeping the material damp assists the rusting.

(12) Where pressure requires, bleed walls to sump pit and cap bleeders upon completion of waterproofing

Covering Capacity

One pound per square foot of surface treated, 5 coats.

Shipping Data

100 lb. steel pails and 20 lb. kits.

SPEED SPEC.

Floors and walls below grade to be waterproofed with METALON in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as listed in SWEET'S ARCHITECTURAL CATALOGUES.

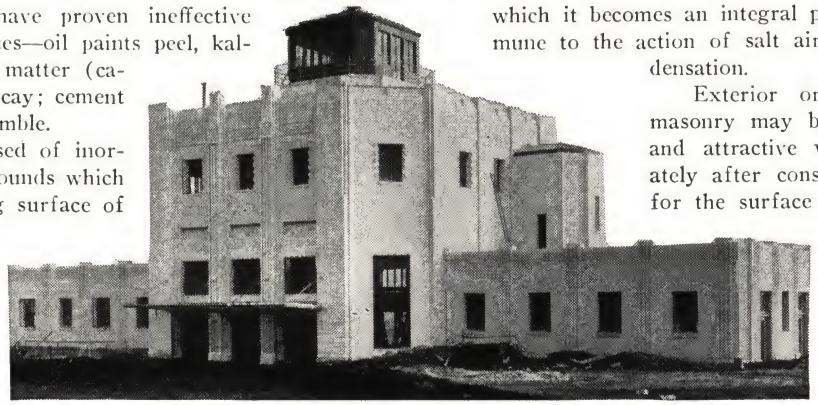
HORNROCK

For Decorating Wet or Dry Walls

Ordinary coatings have proven ineffective for wet or damp surfaces—oil paints peel, kalsomines contain organic matter (casein, glue, etc.) which decay; cement washes effloresce and crumble.

HORNROCK is composed of inorganic, cementitious compounds which adhere to the underlying surface of which it becomes an integral part. It is washable, immune to the action of salt air, steam, vapor and condensation.

Exterior or interior concrete and masonry may be made bright, sanitary and attractive with HORNROCK immediately after construction without waiting for the surface to "cure."



Western Air Express Terminal, Los Angeles, Calif.
A. M. EDELMAN and A. C. ZIMMERMAN, Associate Architects
W. Y. EAVES, General Contractor

HORNROCK is ideal for pools, basements, creameries, laundries, factories, interior or exterior wet or dry concrete or masonry surfaces of all kinds.

806. Light Green

808. Blue

807. Dark Brown

802. Stone Grey

801. White

804. Buff

805. Brick Red

Directions for Use of Hornrock

1. Preparation of Surface—Old paint, whitewash, kalsomine, etc., must be removed. Wash the surface with a 1% to 15% solution of hydrochloric or muriatic acid according to the strength required to remove the particular coating. Wash off the acid. Oil paint should be burned off.

Surface previously coated with kalsomine or similar materials must be scrubbed clean. Efflorescence (a white salt brought out by moisture evaporating in the sun) must be removed with a wire brush or a 10% solution of muriatic acid. Wash off the acid.

All loose dirt, etc., must be brushed off. Where waterproofing is required it is necessary properly to point all cracks and openings in the surface before HORNROCK is applied.

New or slightly damp plastered walls can be treated with HORNROCK without sizing. They should be well soaked with water before HORNROCK is applied.

The surface to which HORNROCK is applied must be thoroughly wet. The wetting of the wall must keep ahead of the HORNROCK application. Care must be taken between coats to prevent the moisture in the coating from evaporating too quickly. This is accomplished by gently spraying the surface of the first coat with water. Water is necessary for hydraulic setting of the material and must, therefore, be supplied as above to prevent undue loss by absorption. Brush and clean out cracks and soak with water.

2. Mixing—No more than will be applied in one continuous operation should be mixed to a creamy consistency. Add the dry powdered HORNROCK to clean water and stir well.

3. Application—The paint is best applied with a stiff-bristled whitewash or Dutch brush, using horizontal, sweeping, rather than vertical motion. Be sure the surface is wet ahead of the work. Do not go over a covered surface as this action may cause the paint to pull and be uneven. For small cracks, force the paint in by brushing over them several times.

The first coat usually takes about 24 hours to harden. Mix the second coat in the same way as the first, using slightly less water. Be sure it is applied to a moist surface. The first coat should be wet down with a soft spray of water before the application of the second coat. Follow all the above directions as given for applying the first coat. When the second coat has begun to harden, spray it gently.

Covering Capacity

Eight pounds of HORNROCK added to 3 quarts of water make 1 gallon for application, which will cover 200 to 300 sq. ft. (one coat), depending upon porosity and texture of the surface.

Shipping Data

HORNROCK is shipped in drums containing 100 lb. and cans containing 10 lb. each.

SPEED SPEC.

Surface (mention areas) shall be thoroughly cleaned and then given two coats of HORNROCK in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

WATERPROOFINGS A HORN PRODUCT FLOOR TREATMENTS

HYDRATITE

Paste—Powder—Liquid

(Patented)
U. S. Patent Numbers 851,247; 1,031,003; 1,255,116; 1,088,022
Canadian Patent Number 156,443

Ammonium Stearate Compound to Be Mixed with Cement to Make Permanently Watertight Concrete and Cement or Lime Mortars

The "Official" Waterproofing

Accept No Substitute

For technical opinions we respectfully refer in *toto* as well as specifically, to the following reports among several of prominent authorities:

American Face Brick Association—
"Wet Walls and Efflorescence" (page 26)
Mellon Institute Fellow Mr. F. O. Anderegg, 1930—
"Construction of Watertight Masonry" (page 322)
Bureau of Standards—
Report No. 370 (page 594)

Hydratite Means Waterproofed

There is no happy medium. A man is either dead or he is not. A building is either waterproofed, or it is not. Just as life is something that cannot be put back into the body, so waterproofing is something which cannot be put back into the concrete, brick mortar or stucco. after the building is built, *therefore:*

You Are Allowed But One Guess

But why guess at all, as to what brand or type of waterproofing to specify and use in your building. The Bureau of Standards at Washington, the American Face Brick Association, the Mellon Institute, through its Portland Cement Association Fellow Mr. F. O. Anderegg, as well as several other highly technical investigators, all agree that ammonium stearate satisfactorily waterproofs. Such associations are organized for your benefit—profit and economize by consulting leading research men. Our thousands of successful installations, the standardization of HYDRATITE by the largest architectural and engineering firms, our thirty-five years of leadership in the waterproofing field—are your factors of safety.

Do Not Approve "Solid Gold"

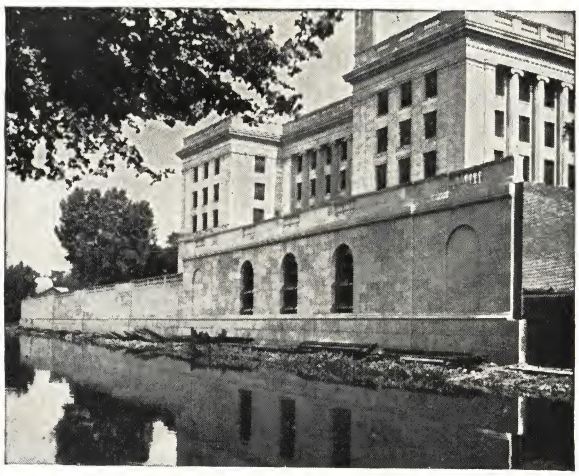
That is the only comparison which can be made when you are asked to approve a cheap competing product to HYDRATITE. You cannot prevent a manufacturer of cuff links from saying that his product is "solid gold" although he sells them for ten cents a pair. If you were specifying gold cuff links, you would either stipulate the karats of gold, or call for a reputable trade-marked article. This is equally true of ammonium stearate. To say a product contains ammonium stearate is not sufficient and most misleading. To say it is an exact duplicate of HYDRATITE is properly defining a product. Nobody can manufacture HYDRATITE more economically or efficiently than the A. C. HORN COMPANY —so why not insist upon the standard material itself.

Accept No Substitute for Hydratite

A. C. HORN COMPANY, LONG ISLAND CITY, N.Y.

Hydratite Specifications

Use Two Pounds or One Quart of Hydratite to Each Bag of Cement



New Jersey State Power House, Trenton, N. J.

All concrete shall be placed in one continuous operation, each batch being puddled to insure maximum density and to avoid "pockets." In cases where joints are absolutely unavoidable, surfaces shall be roughened, cleaned, treated with Horn's BONDSIT (to join new and old concrete) wetted and cement grouted before placing additional concrete.

For waterproofing mass concrete (1:2:4), cement plasters or topping (1:2), cement and lime mortars, or stuccos (1:1:2), HYDRATITE shall be used in the proportion of two pounds of HYDRATITE Powder or Paste, or one quart of HYDRATITE Paste or Liquid, to each bag of cement or lime. For strictly lime mortar use HYDRATITE Paste or Powder.

Add HYDRATITE Powder to the dry cement.
Add HYDRATITE Paste or Liquid to the gauging water.
Maintain stiff mixtures at all times.

Guard Against Efflorescence on Brick Work

Unsightly efflorescence, or white discoloring salts on brick work, are generally due—not to the face brick, but to the mortar joints. Rain beats into the walls through the unwaterproofed joint—penetrates into the soft back-up brick and evaporation draws the salt-laden solution to the outer face, where the water evaporates and the white deposit remains. By waterproofing the brick mortar joints with HYDRATITE mixed in the brick mortar at the time of laying, the ride of the salts to the outer face is prevented.

Specify HYDRATITE in the proportion of two pounds or one quart per bag of cement and avoid, at trivial cost, this marring of the building's costly beauty.

Hundreds of buildings and the world's leading authorities on brick work attest the value of HYDRATITE for dry walls and the prevention of efflorescence.

SPEED SPEC.

All concrete below grade and all brick mortar shall be waterproofed with HYDRATITE in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

Accept No Substitute for Hydratite

VULCATEX

(Patented)

Knife Grade *Power Gun Grade*

Elastic Caulking Compound

Ninety percent of building leaks are due to open joints improperly pointed up. Ineffective bond between joint material and sides of the joints in stone, brick, cast-stone or terra cotta work, as well as joints between masonry and window frames of steel and wood—are responsible for water damages and huge heat losses.

VULCATEX has been on the market for a quarter of a century, and yet the life of its enduring plasticity is yet unknown. It is an extraordinary elastic and rubber-like vulcanization of China wood oil which has stood the test of time. Its bond cannot be broken.

Consult us for tests by:

1. Terra Cotta Association.
2. Indiana Limestone Association at Bureau of Standards.
3. Thompson & Lichtner, testing laboratory for Stone & Webster.
4. Department of Buildings—City of Chicago.

Every Building Requires Caulking and Pointing—Do It Once for All Time By Using Vulcatex

Specifications for Vulcatex

1. General

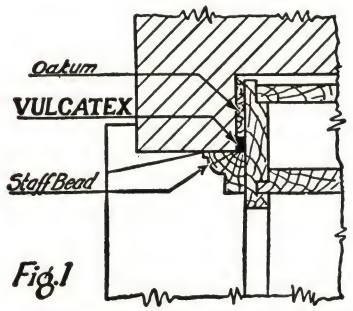
VULCATEX is shipped ready for use. Because of its consistency a pointing trowel is used in its application. Dipping the trowel in crude oil or water or DEHYDRATINE No. 2 will prevent adhesion of VULCATEX to the tool.

Variation in temperature will affect the consistency of VULCATEX. Low temperature will thicken it to a consistency difficult to apply. The correct consistency is shipped from the factory, but the temperature at destination cannot be controlled. Place a bucket of VULCATEX in a tub of hot water and it will soften. VULCATEX is best workable at normal temperature. Joints must be free from dirt or dust. Nothing will adhere to a dusty surface. The sides of all joints shall be coated with DEHYDRATINE No. 2 Transparent Waterproofing, before pointing with VULCATEX.

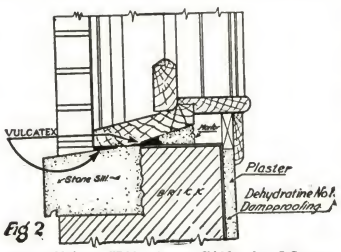
2. Caulking Windows

(a) Jambs and Heads (see Fig. 1)—Staff beads, if present, shall first be removed. The space between the window frame and the masonry shall be caulked with picked oakum driven in tight to within ½ inch of the surface and the joint then filled with VULCATEX.

(b) Sills (New Construction) (see Fig. 2)—In new construction, the space between the sill and masonry shall be sealed with VULCATEX to a depth of at least 2 inches. The VULCATEX should be applied from inside the building as shown in Fig. 2.



Window Caulking Detail—Horizontal Cross Section of Sash



Caulking Window Sills in New Construction

Space between sill and masonry Caulked from inside

(c) Sills (Buildings Already Erected)—In buildings already erected, the space between the sill and masonry shall be caulked by forcing VULCATEX into this space from the outside for a depth of at least ½ inch.

(d) Factory Steel Sash (see Fig. 3)—After the sash is set tight, VULCATEX shall be forced into the space between the sash and masonry to a depth of ½ inch.

3. Pointing Up Terra Cotta, Stone and Cast-stone Work

All joints in projecting cornices, overhanging stone, terra cotta or cast-stone balustrades, parapets and free standing features shall be raked out ½ inch. The sides of these joints shall then be coated with DEHYDRATINE No. 2 Transparent Waterproofing. After this coating, the joint shall be pointed full with VULCATEX.

4. Quantities Required

VULCATEX is sold by the gallon, which contains 231 cubic inches. The amount required can be calculated by computing the cubical contents of the voids or spaces to be filled.

1 gallon of VULCATEX will caulk approximately nine windows, 4x7 feet.
1 gallon of VULCATEX will fill a joint ½x½ inch for 77 linear feet.
1 gallon of VULCATEX will normally be required to point occasional joints in 1000 square feet of brick work.

5. Colors

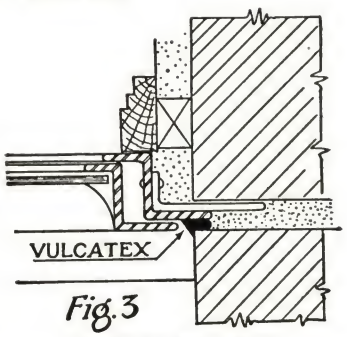
Slate Grey; Light Stone Grey; White; Limestone Color.

Shipping Data

Shipping weight, 15 lb. per gallon. Packed in 50 gallon barrels; half barrels (30 gallons); 5 gallon steel pails; and 1 gallon cans.

SPEED SPEC.

All caulking and pointing shall be done with VULCATEX in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.



Caulking Steel Sash

THE HORN POWER VULCATEX GUN

Requires NO { *Compressors, Electric Motors, Lengthy Hose Lines, Electric or Steam Power Lines, Bulky, Heavy Equipment*

Nothing to get out of order
One Man Can Carry
Ideal for Scaffold Work
Can be Set Up and Filled Quickly

200 Pounds Pressure in Caulking With Vulcatex Without the Expense of a Compressor

Fig. 1

The diagram below shows the details of the HORN POWER VULCATEX GUN. It consists of a steel vessel, Shrader valve, air hose with fittings, delivery hose with its fittings and a pressure relief valve, as a safety device, to take care of any abnormal pressure. The outfit has been tested to a pressure to 300 lb. per sq. in. It comes complete as shown on the list of materials with the exception of items 15, 16, 17, 18, 19 and 20. The complete equipment comes in a specially designed case, that is suitable for shipping and also for carrying from place to place, as it has a hinged top, hasp and handles.

Liquid carbon dioxide is the gas commonly used with these guns, since it is convenient, cheap and readily available in all cities. It is generally bought in cylinders holding 20 lb. of *liquid carbon dioxide*. If carefully used, one of these 20 lb. cylinders will be sufficient to caulk 175 to 200 windows of average size. (Carbonated water in tanks, such as soda fountains require, *is not to be used.*) We do not supply the tank of gas or the pressure reducing valve. Both of these items may be secured from the local source of liquid carbon dioxide.

Effects of Temperature on Vulcatex—Just as molasses becomes thick and slow flowing in cold weather, all plastic materials such as VULCATEX become heavier when cold.

VULCATEX of power gun consistency is formulated to flow properly at temperatures between 60° and 70° F. If it is stored in a cold place, it will become too thick to flow readily from the placing nozzle except by the use of excessive gas pressure. To remedy such a condition, it is necessary only to warm the material by placing the package in hot water, or storing for 24 hours in a warm place.

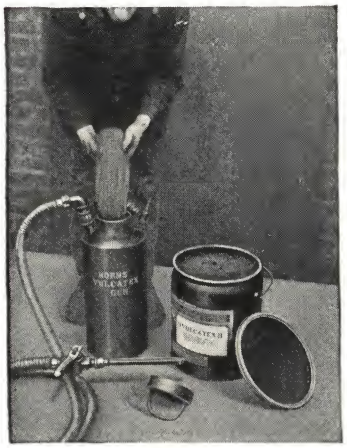


Fig. 2

Fig. 3

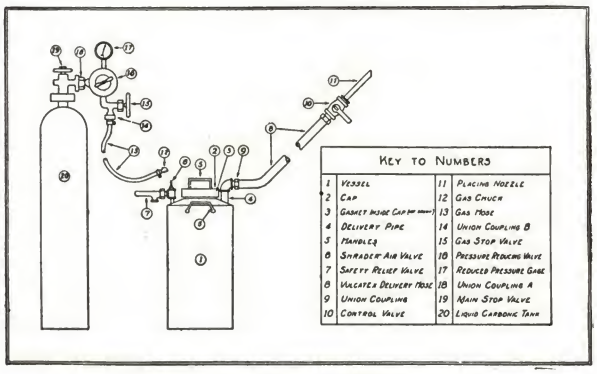


Fig. 1—The VULCATEX delivery hose is attached to the vessel by means of the union coupling with which it is fitted and the control valve on the nozzle is closed.

Fig. 2—The large cap on the vessel is unscrewed and the cylinder filled to within about 2 in. of the top with VULCATEX of power gun consistency. Cap is replaced and screwed up tight enough against gasket so as not to allow any gas to leak out.

Fig. 3—Attach pressure reducing valve to carbon dioxide cylinder by means of union coupling. The air hose is fastened to the carbon dioxide reducing valve by means of the union connection with which the hose is fitted. Valve (19) on top of gas tank is opened and the pressure reducing valve is adjusted to maintain a delivery pressure of between 115 and 150 lb., depending upon temperature conditions and the speed with which the material is required to flow.

Fig. 4—Be sure washers in union couplings are in place, (a) reducing valve washer and (b) air hose washer. Remove the cap from the Shrader tank valve on vessel. Open valve (15) below pressure reducing valve. Apply air chuck to the Shrader valve until gas no longer flows, a point which can be determined by sound. Open control valve on delivery hose.

Fig. 5—In a few minutes hose will fill with VULCATEX and it will flow from nozzle. Caulking may then begin. If flow becomes slower, due to pressure lowering in the tank, renew pressure by application of the air chuck to Shrader valve as mentioned in Fig. 4, closing valve on delivery hose during the pressure renewing operation.

Fig. 6—Lack of VULCATEX in cylinder will be indicated by gas passing through delivery hose and the nozzle will "spit." Close control valve immediately, To refill the vessel, *reduce pressure in vessel by depressing needle of the Shrader valve.* Use cap of valve. *When pressure has been entirely relieved,* unscrew cap on vessel and refill as mentioned in Fig. 2.

Caution: Never remove cap of vessel without first relieving pressure in vessel.

Fig. 4

Fig. 5

Fig. 6

DEHYDRATINE NO. 2

Exterior Transparent Coating For VIRGIN Surfaces

(For Indiana Limestone, Sandstone and other light-colored masonry specify Dehydratine No. 2A)

DEHYDRATINE NO. 2

DEHYDRATINE No. 2 has become a by-word in architectural and engineering circles for efficiency and economy in preserving brick, stone, concrete and stucco. In preventing the absorption of water, from beating rainstorms or atmospheric moisture, not only are damp stains guarded against, but also splitting and cracking from frost, rusting of metal lath, etc.

Today the presence of efflorescence upon a well-designed building is considered an unkempt reflection upon its constructors. DEHYDRATINE No. 2 insures a cleaner structure by sealing the pores, preventing the appearance of the ugly appearing stored-up salts called efflorescence, and eliminating the absorption of dirt particles.

One of Many Large College Groups Treated with Dehydratine No. 2

DEHYDRATINE NO. 2A

DEHYDRATINE No. 2 Transparent Waterproofing slightly deepens the color of the surface to which it is applied—a decided advantage upon many walls.

To meet the necessity for a colorless transparent treatment for Indiana limestone, sandstone and other light colored masonry, our DEHYDRATINE No. 2A was designed.

In service for many years, tested and approved by the Department of Testing Materials of the Indiana Limestone Association, DEHYDRATINE No. 2A, with its deep penetration and resistance to erosion and disintegration, has become a standard.

General Specifications

Materials

(1) DEHYDRATINE No. 2, as manufactured by the A. C. HORN COMPANY, Long Island City, N. Y., is to be delivered in original and sealed packages on the building site. It must be applied as received without the addition of any thinning material.

(2) VULCATEX Elastic Cement (four standard colors), as manufactured by the A. C. HORN COMPANY, Long Island City, N. Y., is to be used for pointing up all cracks, openings, and joints on wall surfaces and copings and to be used in caulking all windows before the application of DEHYDRATINE No. 2.

Cleaning

Surfaces should be carefully dry wire-brushed to remove all efflorescence, loose particles and other foreign matter such as dust, etc.

Application Temperature

The best results are obtained from the application of DEHYDRATINE No. 2 when temperature is above 60° F.

Method of Application

Not less than two coats of DEHYDRATINE No. 2 are to be applied (mention exterior surfaces) and where the surface is very porous apply the necessary amount of DEHYDRATINE to saturate. Use a spray or a short-handled stiff 4-in. brush in order to drive the material into the surface. Keep material luke-warm and when not in use, in a closed container.

To Cure Efflorescence—Dry brush the surface with a scrubbing brush until all the whitish salts are removed—*under no circumstances must water or any liquid be used in the removal of the salts*—mechanical action only must be used. Apply two coats or more of DEHYDRATINE No. 2 until the surface will not further absorb.

For Dampproofing Exterior Stucco, Brick or Concrete Surfaces—"Point" up all cracks, joints, openings, windows and copings with VULCATEX Elastic Cement. (Send for special pamphlet.)

VULCATEX is made in four standard colors so as to conform to architectural effects: Slate grey, light stone grey, white, limestone color.

Dry brush the surface and apply not less than two coats of DEHYDRATINE No. 2.

For Waterproofing Tanks, Silos, and other Water Containers—The surface must first be allowed to dry thoroughly. All pin holes, cracks, and joints must be filled with VULCATEX. DEHYDRATINE No. 2 is then applied in not less than two coats on the water side of the containers.

Covering Capacity

Approximately 125 sq. ft. per gallon, 2 coats.

Shipping Data

Weight—9 lbs. per gallon. Shipped in drums, half-drums, 5-gallon cans and 1-gallon cans.

SPEED SPEC.

All exterior masonry surfaces shall receive not less than two coats of DEHYDRATINE No. 2 in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

SYMENTREX

Decorative Waterproof Coating for Concrete and Masonry

Description

For thirty years SYMENTREX has been recognized as a leader of coatings combining color and waterproofness. It is immune to weather and disintegration by the alkalies in cement. Its fine texture may easily be washed with soap and water to renew its attractive and lasting color. Furnished in liquid form, applied to the dry surface in two coats by means of brush or spray, SYMENTREX solves the problem of waterproofing and beautifying masonry surfaces, including brick, concrete and stucco.

Since the cost of material approximates less than 25% of the total expense of effectively waterproofing and decorating in one operation, the use of cement washes or linseed oil paints has been discarded for the permanency of SYMENTREX.

Cumar gum, one of the constituents of SYMENTREX, may be boiled in caustic soda without disintegration—so strong is its resistance to alkali.

Whether it be the humble stucco cottage in Maine, or the palatial hotels of Florida and California—SYMENTREX has long been withstanding the severe conditions of sun, rain, freezing and still worse —the attack of the alkali elements in the surface to which it is applied.

Truly a time-tested and proven product of the Horn Line.

Covering Capacity

SYMENTREX covers 200 sq. ft. per gallon first coat and 300 sq. ft. per gallon second coat, depending upon the surface.

101. Slate

102. Grey

103. Cement Color

104. Drab

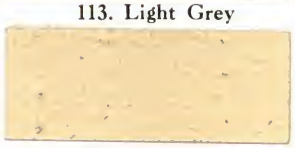
105. Ivory

106. Red

107. Buff

111. Cream

113. Light Grey



114. Sandstone

Shipping Data

SYMENTREX is shipped in barrels (approximately 50 gallons); half-barrels (30 gallons); 5-gallon steel pails; 1-gallon cans (6 cans to the case).

Directions for Use

Preparation and Condition of Surface—

Surfaces to receive SYMENTREX must be clean and dry. Concrete or stucco should be thoroughly cured before the coating is applied. All loose or foreign matter must be removed from the surface by wire-brushing or scraping before the coating is applied. All cracks or holes shall be cut out and carefully pointed with 1:2 Portland cement mortar.

Application—

SYMENTREX should be applied in two (2) coats. The material should be thoroughly stirred before using and as often as may be necessary to keep the base in suspension. SYMENTREX for the first coat should be thinned with turpentine in the proportion of ½ to 1 pint turpentine per gallon of SYMENTREX.

SYMENTREX for the second coat (or succeeding coats) should be used as received without thinning.

SPEED SPEC.

All exterior stucco and concrete shall be given two coats of SYMENTREX, in accordance with the exact directions of the manufacturer, the A. C. HORN COMPANY, as filed in SWEET'S ARCHITECTURAL CATALOGUES.

DEHYDRATINE NO. 1

Dampproofing Plaster Bond

For a quarter century Dehydratine No. 1 has protected this famous landmark

Tiffany Building, New York, N. Y.
McKim, Meade & White, Architects
Chas. T. Wills, Builder

Dampproof the inner walls by surrounding them with an impervious, moistureproof coating, thereby protecting the plaster from damp-stains.

Plaster (not cement) *bonds perfectly* with Dehydratine No. 1, as is proven by the many millions of square feet of walls now dampproofed.

Dehydratine No. 1 is composed of a complex blend of the finest asphalts combined with non-volatile oils, minerals, treated vegetable oils and pitches, thinned with mineral distillates. Intimate combinings of heat processes and proportions provide elasticity, adhesion, toughness and pliability to withstand expansion and contraction of walls.

Insulation—the absence of heat losses from within and of penetrating cold air from without—have made Dehydratine No. 1 a most essential protection.

Dehydratine No. 1 is not to be used as a coating for, or over, cement.

The pride of the Southwest treated with Dehydratine No. 1

Esperson Building, Houston, Tex.
John Eberson, Architect
American Construction Co., Contractors

Specifications for Applying Dehydratine No. 1

Dampproofing Brush Coating for Inner Faces of All Weather Exposed Walls

(1) Material—Dehydratine No. 1 Dampproofing Brush Coating as manufactured by the A. C. Horn Company, Long Island City, N. Y., is to be purchased direct from the manufacturer or their authorized agents, and is to be delivered on the building site in original sealed packages.

It must be used without the addition of any thinning agents or any adulterants.

(2) Caution—Great care must be taken in the application of this coating to see that no pinholes remain and that a thorough covering coat is obtained.

(3) Pointing—All large holes must be pointed up with Dehydratine No. 1 to provide a surface to receive the dampproofing.

(4) Number of Coats—Two thorough covering coats of Dehydratine No. 1 are to be applied to (name surface), 24 hours being allowed between coats. These coats must be absolutely continuous and perfect in every respect.

(5) Plastering—Plaster may be applied over surfaces covered with Dehydratine No. 1 within an interval of from 1 to 30 days.

Covering Capacity

Dehydratine No. 1 covers 50 sq. ft. per gallon, double coat; 80 sq. ft. per gallon, one coat.

Shipping Data

Weight—8.5 lb. per gallon. Shipped in drums, half-drums, 5-gallon pails and 1-gallon cans.

SPEED SPEC.

The inner faces of all exterior walls are to be dampproofed with Dehydratine No. 1 in accordance with the exact specifications of the manufacturer, the A. C. Horn Company, as filed in Sweet's Architectural Catalogues.

MASTIC
DEHYDRATINE NO. 10
SEMI-MASTIC
A Dampproofing Plaster Bond Which Spans the Holes and Cracks

Guarantee Against Poor Workmanship

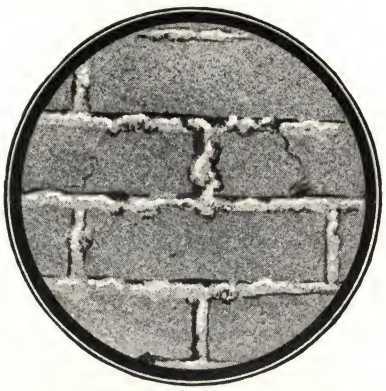
DEHYDRATINE No. 10 is your guarantee against poor workmanship in masonry walls. In spite of the utmost care in supervision, holes, poorly filled joints, cracks between mortar and bricks, will occur on the average job. To span these openings with a brush coating is difficult. Only a heavy mastic can hope to bridge over actual cracks.

Real Dampproofing-Heatproofing

The small difference between the cost of a good brush coating, called a "plaster-bond," and the cost of a heavy coating of DEHYDRATINE No. 10 is not a saving. This difference will be spent every year by the building owner because of increased fuel bills. DEHYDRATINE No. 10 not only preserves the building from damp spots but also is a proven insulating medium. The subject of heat loss has assumed equal importance with weatherproofing. Both are cared for by specifying the use of DEHYDRATINE No. 10. Prevent condensation and sweating.

Elasticity—Adjusts itself to any possible expansion or contraction of masonry or joints.

Adhesiveness—Bonds solidly to any dry masonry or metal.



DEHYDRATINE No. 10 is not recommended for use on concrete walls or ceilings nor should portland cement mortar or concrete be applied over it.

Fire-Retarding—The reinforcing element is, in itself, a check to fire.

Waterproof—Will successfully resist a hydrostatic pressure if facing the head of water.

Erosionproof—The plastic character of the compound prevents its being worn away by erosion.

Acidproof—By its nature and composition DEHYDRATINE No. 10 is proof against acids or alkalies or other corroding influences, neither is it affected by water containing sulphates, carbonates, nitrates or chlorides in solution.

Temperature-proof — DEHYDRATINE No. 10 remaining, as it does, indefinitely plastic, there can be no possibility of cracks, even in the coldest weather. It will not flow after application in even the warmest weather.

Specification for Holeproofing Walls

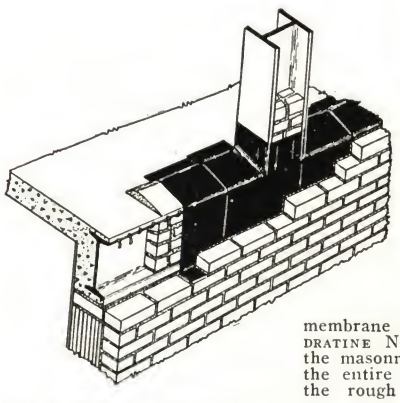
The inner surfaces of all weather-exposed walls (except concrete) are to be thoroughly coated with DEHYDRATINE No. 10, as manufactured by the A. C. HORN COMPANY. No crevices are to be left uncovered. All pinholes and voids to be pointed. Plaster to be applied directly over DEHYDRATINE No. 10 at any time within an interval of thirty days after the walls have been coated.

HORN'S SPANDREL BEAM WATERPROOFING

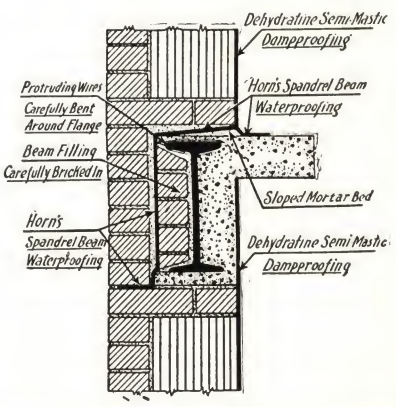
Specifications

(a) All wires shall be bent against underside of beam flanges. On top of outside edge of floor arch lay a bedding of cement mortar sloping back to thickness of ⅝ in. and 8 in. wide. Space between web and flanges on outside of spandrel beams and wall columns to be filled with brickwork to form a smooth surface.

(b) Apply TRIPLEFLEX FABRIC buttered on one side with DEHYDRATINE No. 10 Mastic, both as manufactured by the A. C. HORN COMPANY, to the outside of all exposed beams, butter side to masonry, carried 3 in. beyond inside wall line and out 3 in. on first course of brick below bottom of beam. Flash membrane up 6 in. on all but inner face of outside columns. No wrinkles permitted.



(c) Waterproofing Spandrel Beams—The outside of all exposed beams shall be waterproofed by the application of a membrane of Tripleflex Fabric, one side of which has been given a trowel coat of DEHYDRATINE No. 10 Mastic Dampproofing, these materials manufactured and supplied by the A. C. HORN COMPANY, Long Island City, N. Y. The membrane shall be applied with DEHYDRATINE No. 10 covered side next to the masonry. It shall extend through the entire wall and be carried in on the rough concrete floor at least 3 in. beyond the wall line so as to lap on the wall dampproofing which will be applied later. The membrane shall be carried down the face of the beam filling for depth and then out 3 in. on first course of brick below bottom of beam. All joints shall be lapped at least 3 in. and well buttered with DEHYDRATINE No. 10. The membrane shall be flashed up at least 6 in. at the outside and two adjacent sides of all wall columns and on all faces of corner columns. The membrane shall be applied in units approximately 3 ft. wide and of sufficient length to conform to the construction detail as specified above. After the columns have been flashed as above described, the flashing around the corners shall receive a reinforcing strip of the waterproofing which shall be applied to the outside corners extending for the full height of the flashing and at least 3 in. on each face of the column. The membrane shall be pressed tightly against the underlying surface so there shall be no wrinkles. This contractor shall cooperate with the mason contractor in order to schedule his work properly and avoid delays. All brickwork, bending of wires, and application of mortar bed on top of the floor arch shall be done by others.



Other Famous

DEHYDRATINES

DEHYDRATINE NO. 3—Stone and Trim Stainproofing Backing

A specially prepared, quick-drying *black brush coating* to be applied on all unexposed surfaces of cut stone or of wood trim.

This compound has for its object the protection of limestone and other light colored stones from the stains caused by the percolation of dampness through the grain and which afterwards are revealed in discolorations on the face of the stone.

The sources of these stains may be traced to the coloring matter and salts absorbed from the brick backing into the stone by saturation.

DEHYDRATINE No. 3 should be used on the back of all trim to prevent warping and dry rot.

Covering Capacity—100 sq. ft. per gallon, 1 coat.

Shipping Data—Weight, 8.5 lb. per gallon. Shipped in drums, half-drums, fives and ones.

DEHYDRATINE NO. 4—Foundation Brush Coating

A viscous black bitumastic compound to be applied *cold* with a brush.

Is especially designed for substructural work. Excludes ground water and gases from the substructures. Keeps the concrete or masonry dry and free from the disintegrating influences of dampness. For waterproofing:

(1) Concrete or masonry foundation walls (applied to the outside surface below grade).

(2) Bridge abutments, retaining walls, and culverts.

(3) As a damp course, over:

(a) Footing, (b) top of foundation walls in buildings without basements, (c) concrete floors on the ground to be overlaid by wood or linoleum.

(4) Rear of parapet walls and fire walls projecting above the roof.

(5) Cisterns, tanks, etc.

(6) In priming masonry surfaces to be coated with asphalt.

In its composition, DEHYDRATINE No. 4 has all the properties requisite for efficient results when used for the above mentioned purposes. It is bituminous, tough, plastic and elastic; heavy in body and water resistant. It is applied cold, thus saving the expense and inconvenience of liquifying by heat.

Covering Capacity—33 sq. ft. per gallon, 2 coats.

Shipping Data—Shipping weight, 8.5 lb. per gallon. Shipped in drums, half-drums, fives and ones.

DEHYDRATINE NO. 5—Saponification-Proof Steel Paint

A field coating for structural steel, metal lath or miscellaneous iron that is to be covered with masonry, concrete or plaster. It is a fused hydro-carbon paint, formed into a homogenous mass and does not settle to the bottom as a pigment coating would. Its homogeneity insures a uniform coat over the surface to which it is applied, no stirring of the liquid being necessary.

Its ingredients are selected for their resistance to acid and alkali; they are combined and treated so that a film of DEHYDRATINE No. 5 has the same elasticity as the steel itself. This gives an added durability because the paint does not peel or crack.

The resistance of DEHYDRATINE No. 5 to acid is important particularly where the film comes in contact with cinder concrete, or where such gases as carbon dioxide or sulphur dioxide are present.

DEHYDRATINE No. 5 is not affected at all by the alkali of mortar or concrete. It is a non-conductor of electricity, one coat resisting six hundred volts.

DEHYDRATINE No. 5 is a steel preservative in every sense of the word.

Covering Capacity—500 sq. ft. per gallon, 1 coat.

Shipping Data—Shipping weight, 8.5 lb. per gallon. Packed in drums, half-drums, fives and ones.

DEHYDRATINE NO. 6—Waterproof Trowel Coating

(See Dehydratine No. 4 for brushing consistency)

A black compound similar to DEHYDRATINE No. 4, but of a heavier consistency and to be applied with a trowel. For application to uneven surfaces which cannot be effectually covered with a brush coating.

Works readily into small holes and irregularities. Has a good consistency and bonds tightly to the surface to which it is applied. Is proof against alkali and acid reactions of ground waters.

Among the uses of DEHYDRATINE No. 6 may be included the following:

(1) Dampproofing foundations below grade against surface drainage.

(2) As a damp course across footings and over tops of foundation walls, in buildings without basements.

(3) As a waterproof cut-off course under masonry copings and sills.

(4) Waterproofing rear surfaces of brick parapet walls.

Note: It is recommended that surfaces to be coated with DEHYDRATINE No. 6 should be primed with a brush coating of DEHYDRATINE No. 4.

Covering Capacity—26 sq. ft. per gallon, coating $\frac{1}{16}$ inch thick.

Shipping Data—Shipping weight, 10 lb. per gallon. Shipped in drums, half-drums, fives and ones.

DEHYDRATINE NO. 7—Hot Foundation Mop Coating

A specially prepared and blended asphaltic compound for application directly to outside of foundation walls below grade; or in conjunction with TRIPLEFLEX FABRIC in membrane waterproofing.

It is chemically inert; is acid and alkali proof; it never becomes brittle and remains ductile and flexible at all ordinary temperatures. It yields without breaking under flexure, expansion and contraction.

Physical Properties of Dehydratine No. 7—

Specific Gravity 77 deg. F.	1.07
Melting Point (Ball and Ring Method)	164 deg. F.
Penetration at 77 deg. F.	10 to 20
Penetration at 32 deg. F.	9 or over
Ductility	3+
Flash Point	610 deg. F. min.
Evaporation Loss	1% max.
Solubility in Carbon Bi-Sulphide	99.8% min.

Covering Capacity—33 sq. ft. per gallon, 1 coat.

Shipping Data—Shipping weight, 8.5 lb. per gallon. Shipped in drums.

REPRESENTATIVE JOBS OF HORN PRODUCTS

Akron, Ohio
Seiberling Factory
Albany, N. Y.
D. & H. Railway Co. Office Bldg.
Aledo, Ill.
Kraft-Phenix Cheese Factory
Amherst, Mass.
Amherst University
Annapolis, Md.
U. S. Naval Academy
Atlanta, Ga.
Cable Bldg.
Department Store, Chamberlain, Johnson and DuBoise
Attica, N. Y.
State Prison
Auburn, N. Y.
Auburn City Hospital
Aurora, Ill.
C. B. & Q. Railway Depot
Austin, Tex.
Norwood Tennis Courts
Baltimore, Md.
Metropolitan Savings Bank Bldg.
Barrytown, N. Y.
St. Joseph's School
Beaumont, Tex.
San Jacinto Life Insurance Bldg.
Stone & Webster Power Plant
Berkeley, Calif.
H. J. Heinz Corp.
Biltmore, N. C.
Biltmore Estate
Boston, Mass.
American Radiator Co., Warehouse
John Hancock Mutual Life Ins. Bldg.
The First Church of Christ, Scientist
Bound Brook, N. J.
Bakelite Company
Bridgeport, Conn.
City National Bank Bldg.
Bristol, Conn.
Bristol High School
Bronx, N. Y.
Bronx Terminal Market
DeWitt Clinton High School
Brooklyn, N. Y.
Mergenthaler Linotype Co.
U. S. Ptg. and Litho. Co.
Buffalo, N. Y.
International Milling Co.
N. Y. Telephone Co.
Camden, N. J.
Campbell Soup Plant
Charleston, W. Va.
Kanawasha Valley Bldg.
Chicago Ill.
C. & N. Railroad Depot
The Chicago Tribune Bldg.
Edgewater Beach Hotel
Palmolive Bldg.
Popular Mechanics Magazine Bldg.
Western Electric Co. Bldg.
Women's Athletic Club
Wrigley Bldg.
Cleveland, Ohio
Sloane Bldg.
Columbus, Ohio
Columbia Savings Bank and Trust Co.
Dallas, Tex.
Dallas Telephone Bldg.
General Motors Co.
M. K. & T. Railroad Station
Sears-Roebuck Warehouse
Western Electric Warehouse
Detroit, Mich.
Alhambra Theatre
Edsel Ford Home
Ford Motor Car Co.
La Salle Theatre
Easton, Pa.
Sterling Products Co.
Emeryville, Calif.
C. K. Williams Co. Plant
Ensley, Ala.
5-Million-Gallon Reservoir
Fitzdale, Vt.
Fitzdale Paper Co.
Fort Worth, Tex.
Y. M. C. A. Bldg.
Galveston, Tex.
American National Bank Bldg.
Hamilton, N. Y.
Colgate University
Hartford, Conn.
Phoenix Mutual Life Ins. Co.
Hoboken, N. J.
Lackawanna Terminal
Hollywood, Calif.
Pantages Theatre Bldg.
Hot Springs, Va.
Bath National Bank
Houston, Tex.
Cotton Exchange Bldg.
Electric Bldg.
Gulf Bldg.
Majestic Theatre
Medical Arts Bldg.
Merchants and Manufacturers Bldg.
Petroleum Bldg.
Rettigs Ice Cream Plant
Rice Hotel
Ithaca, N. Y.
Cornell University
Jacksonville, Fla.
Purity Ice Cream Co.
Kansas City, Mo.
Bell Telephone Bldg.
Kenwood, N. Y.
Oneida Community Office Bldg.
Lake Placid, N. Y.
Lake Placid Club
Long Beach, Calif.
Ford Motor Co.
Long Island City, N. Y.
American Eveready Works
Ford Bldg.
Los Angeles, Calif.
L. A. Central Library
Exposition Park
First Baptist Church
Harold Lloyd Estate
Los Angeles Auto Club
Los Angeles County Hospital
Los Angeles Tennis Club
Pacific National Bank Bldg.
Paramount Lasky Corporation
Willard Battery Plant
Women's Athletic Club
Louisville, Ky.
L. & N. Railway Co.
Massena, N. Y.
U. S. Aluminum Co.
Middletown, Conn.
Wesleyan University
Montreal, Quebec
Y. M. C. A.
Mount McGregor, N. Y.
Metropolitan Life Ins. Co. Sanitarium
Newark, N. J.
Alderney Diary Company
Kent Automatic Garage
N. J. Bell Telephone Co. Bldg.
New Haven, Conn.
Yale University
New Orleans, La.
Hotel Denechand
New York, N. Y.
American Tel. & Tel. Bldg.
Bee Lines, Inc., Bus Terminal
Canadian Pacific Bldg.
Chrysler Bldg.
Columbia University, School of Mines
Cornell Medical Center
Arnold Constable Bldg.
Eleto Warehouse
Empire State Bldg.
Fred F. French Bldg.
Garment Center Capitol
General Motors Bldg.
Heckscher Bldg.
Hotel Ambassador
Hotel New Yorker
International Magazine Bldg.
Kent Automatic Garage
Lehigh Valley Freight Terminals
Lexington Ave. Subway Stations
McGraw-Hill Building
New York Central Bldg.
No. 1 Park Avenue
Park and Tilford Warehouses
Salvation Army Headquarters
Savoy-Plaza Hotel
Schrafft's Restaurants
Standard Oil Bldg.
S. W. Strauss & Co. Bldg.
Walker-Lispenard Telephone Exchange
Ward Baking Co.
Warner Bros. Bldg.
R. C. Williams Warehouses
Woolworth Bldg.
Niagara Falls, N. Y.
American Cyanamid Co.
Oakland, Calif.
Capwell Emporium Department Store
Durant Motor Co. Plant
Fisher Body Corp.
Shredded Wheat Co.
Philadelphia, Pa.
Fairmount Art Museum
Hahneman Hospital
Integrity Trust Bldg.
Irvine Auditorium
Rochester Gas & Electric Co.
University of Pennsylvania
Pennsylvania R. R. Main Station.
Pittsburgh, Pa.
Plaza Office Bldg.
Port Chester, N. Y.
United Hospitals
Providence, R. I.
Narragansett Gas Co. Bldg.
Rochester, N. Y.
Eastman Kodak Co.
Rome, N. Y.
Montgomery Ward Co.
Sacramento, Calif.
Civic Auditorium
St. Louis, Mo.
Anheuser-Busch "Bevo" Plant
Metropolitan Bldg.
San Antonio, Tex.
Majestic Theatre Bldg.
San Diego, Calif.
State Teachers' College Bldg.
San Francisco, Calif.
United States Custom House
Schenectady, N. Y.
American Locomotive Works
Seattle, Wash.
Bon Marche
Standard Furniture Co. Bldg.
Washington Athletic Club
Springfield, Mass.
Westinghouse Electric Co.
Stamford, Conn.
Yale & Towne Mfg. Plant
Syracuse, N. Y.
Syracuse University Hospital
Tia Juana, Mex.
Agua Caliente Racing Pavilion
Tonawanda, N. Y.
American Kardex Co.
Trenton, N. J.
W. & J. Sloane Linoleum Plant
Utica, N. Y.
Crane Company
Westinghouse Mfg. Co.
Washington, D. C.
Cary Ice Cream Co.
U. S. Senate Office Bldg.
Wellesley, Mass.
Wellesley College

A PRODUCT FOR EVERY CONDITION and METHOD

FLOOR TREATMENTS

WATERPROOFINGS

DAMPPROOFINGS

TECHNICAL PAINTS

A.C.Horn Company

WORKS~LABORATORIES~EXECUTIVE OFFICES

Long Island City~New York

HYDROSEAL WATERPROOFING COMPANY

829-835 North 3rd Street, PHILADELPHIA, PA.

Products

HYDROSEAL BITUMASTIC COATINGS; PENETRITE INTEGRAL WATERPROOFINGS; PENETRITE FLOOR HARDENERS and COATINGS; HYDROSEAL METALTITE; KLING-KOAT CEMENT COATING; MASONRY COATINGS; CAULKING COMPOUND. Below is a list of the specific materials for average conditions.

Hydroseal

PENETRITE

METALTITE

TRADE-MARKS

20 Years of Proven Service

Since 1911 Hydroseal Products have been successfully used on both old and new constructions, materially reducing the cost of maintenance against further disintegration and damage.

We are not only manufacturers, but also engineers and contractors. We maintain a corps of skilled mechanics who apply our products under the supervision of men recognized as authorities in their field.

The many well-known buildings on which our products have been successfully used are permanent testimonials to the quality of our materials, and our thorough knowledge of waterproofing.

Laboratory and Field Tested

There is a Hydroseal Product for every waterproofing need. Each product has not only been laboratory tested but has thoroughly proven itself by most satisfactory results in actual use. Since our beginning in 1911 we have endeavored to make the finest possible materials. We have never sacrificed high quality to meet price.

The fact that Hydroseal Waterproofings are so generally used proves that our clientele realized that it is folly to jeopardize the entire result of a job by using an inferior grade of waterproofing when there is so little difference in cost.

We co-operate with the architect to see that he receives the results he desires, as well as to see that the material is applied correctly. We are glad to send literature on any Hydroseal Product.

Brands, Uses and Specifications

PURPOSES	MATERIAL	SPECIFICATIONS
For Dampproofing and Waterproofing Concrete, Brick and Cement		
To dampproof exposed walls to be plastered—unfurred or furred with hollow brick, furring tile or concrete blocks.	*Hydroseal* No. 330	Coat the interior of all exposed walls 1 coat, and, if necessary, 2
To prevent surface infiltration and dampness in basements and cellars	*Hydroseal* No. 640	Apply 2 heavy continuous coats
For dampproofing the interior of exterior walls above or below grade	*Hydroseal Semi-mastic*	To be applied (stipulate where) by a 4 knot brush, to be a continuous coating from grade to roof line, 1 ft. on ceiling
To prevent and resist severe conditions of dampness and water below sub-level	*Hydroseal* No. 640, in conjunction with burlap, felt or cheesecloth	Apply No. 640, and burlap, etc., alternately 3 to 5-ply until the hydrostatic pressure is equalized
To render waterproof by physical mixture with concrete and cement	*Penetrite* Integral Waterproofing Paste	For ordinary work add 1 gal. to 32 gal. of water
	Penetrite Integral Waterproofing Powder	Use 2 lb. to a bag of cement; under most severe conditions, 3 lb.
An iron waterproofing applied on the inside face of exterior walls below grade, and on top of structural slabs	*Hydroseal Metaltite*	To be applied and guaranteed by Contract Department of H. W. Co.
Used as an integral waterproofer, an integral hardener, as well as an anti-freeze	*Conwatco Mix*	Conwatco Mix as waterproofer for mass concrete, use 1 gal. to 15 gal. of gauging water
For Stainproofing Limestone and Marble		
For the protection of limestone, marble, etc., against stain caused by the cement through surrounding masonry	*Hydroseal* No. 309	Apply to all unexposed sides of stone, 1 continuous coat
To prevent water penetration through old walls of stucco, cement faced brick or stone by an exterior application	*Penetrite* Transparent Compound	Apply 2 coats, having joints well mortared
For the Protection of Metal		
For prevention against electrolysis and corrosion of exposed structural steel	*Hydroseal* No. 352	Apply 1 shop coat, to be followed by a field coat, different color
For Waterproofing and Beautifying Concrete and Plaster Surfaces		
To beautify and protect exterior walls of brick, stucco cement, and concrete	*Kling-Koat* Cement Coating (flat and gloss)	Applied like paint, 2 coats
To prevent water penetration through old walls of stucco, cement faced brick or stone by an exterior application	*Penetrite* Transparent Compound	Apply 2 coats, having joints well mortared
For Treatment of Floors		
To prevent the dusting and abrasion of concrete floors	*Penetrite* Floor Finish	Apply 1 coat primer and 2 coats finish. Allow 24 hours between applications
For application after cement or concrete floor is laid. Makes the floor hard, dustproof and waterproof	*Penetrite* Liquid Floor Hardener	One application is all that is necessary if the condition is not severe
Mixed with the cement to harden and waterproof	*Penetrite* Metallic Floor Hardener	Approximately 20 lb. to a sq. ft. in the 1-in. top coat
Used as an integral waterproofer, an integral hardener	*Conwatco Mix*	For mass concrete and top coat use 1 gal. of gauging water. For mortar work use 1 qt. to 1 bag of Portland cement
For Caulking		
Between masonry and window frames, wood or steel, caulking joint of coping, overhanging cornices, etc.	*Hydroseal* Caulking Compound	Write for details.
Spandrel Beam Waterproofing		
	Hydroseal Method	Write for details.

THE HYDROLITHIC WATERPROOFING CO., INC.

Engineers and Contractors for Waterproofing

725 Grant Building, PITTSBURGH, PA.

TELEPHONE, Atlantic 1890, 1891

EASTERN REPRESENTATIVE: Taylor-Hydrolithic Co., 95 Liberty Street, New York, N. Y.—Telephone, BArclay 7-6980

Services

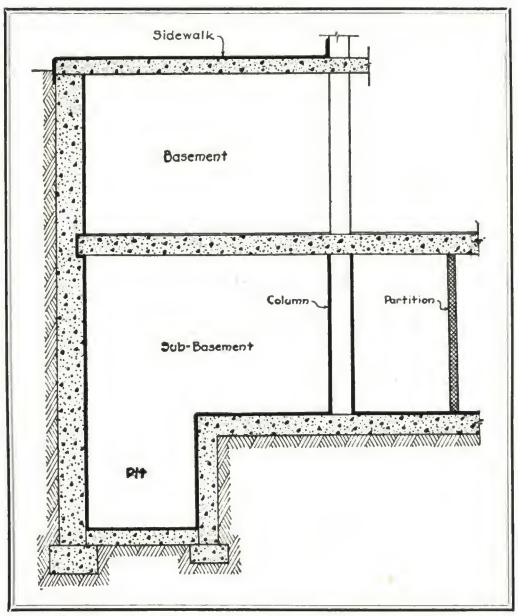
We are ENGINEERS and SPECIALISTS for WATERPROOFING, making a specialty of Cement Coat Waterproofing.

We contract for the waterproofing of basements, subways, reservoirs, vaults, tunnels, swimming pools, boiler rooms, elevator pits, etc.; guaranteeing a positive and permanent waterproofing for all kinds of masonry construction.

Our Engineering Department is always at the service of architects, contractors, or others, and will be pleased to give preliminary estimates and information without obligation.

Standard Oil Co. Building, New York, N. Y.
CARRERE & HASTINGS, Architects

Registered
HYDROLITHIC
TRADE-MARK



Interior Method of Foundation Waterproofing

Over Forty Years without a Failure

All work is executed in the well-known Winslow's Hydrolithic System which was invented by E. J. Winslow more than 40 years ago.

It is the original plaster coat method and, although its wonderful success has inspired a host of imitators, it is still easily a leader in its field.

Application

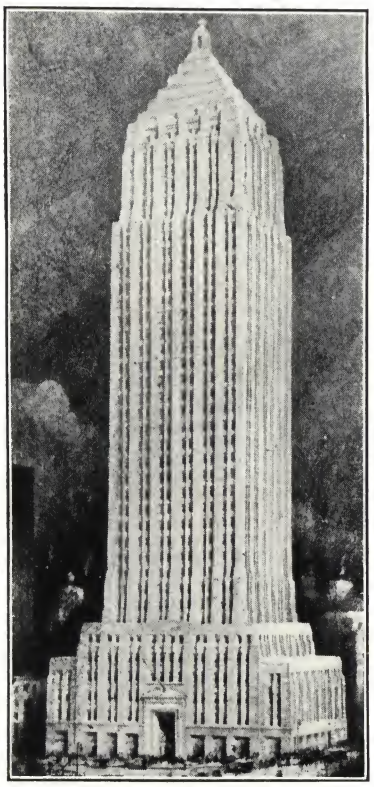
Hydrolithic is applied as a cement plaster coat to the inside of exterior walls and top of floors. Wall coatings are ⅝ in. and floor coatings 1 in. thick, all surfaces being thoroughly roughened and cleaned before application. Due to the special qualities of Hydrolithic and the expert care with which it is applied, a perfect bond is secured.

Hundreds of successful installations are in existence all over the country where Hydrolithic has for many years remained absolutely dry, although subjected, in many cases, to very high hydrostatic pressures.

Advantages

The advantages of our Hydrolithic System are many, as follows:

It is permanent; it is economical; no extra supporting walls are required; no additional floor finish is necessary; changes can be made easily and economically without delaying other building trades; it can be applied as readily to old buildings as to new; it forms a good wearing surface on the floor and an attractive wall finish; it is not affected by heat and can be used in boiler rooms and other places where the heat would destroy pitch and felt waterproofing.



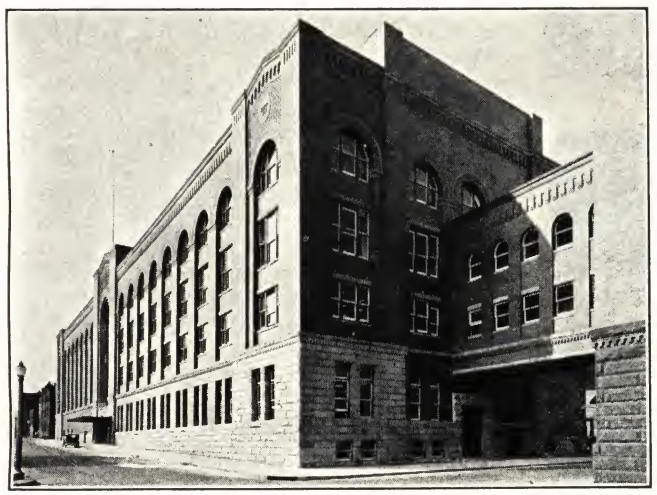
Office Building Gulf Refining Co., Pittsburgh, Pa.
TROWBRIDGE & LIVINGSTON, Architect
E. P. MELLON, Associate Architect

Specifications

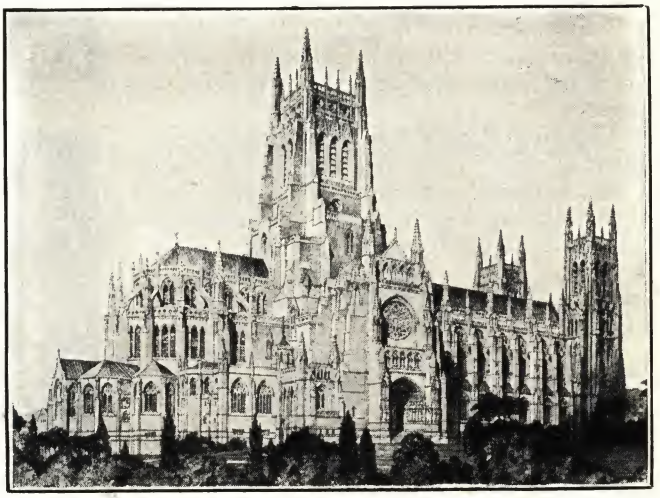
The interior surface of all exterior walls to a height of .... feet above the finished basement floor and the upper surface of the concrete floor slab of the entire basement [sub-basement] as well as all trenches, pits and machinery foundations shown on the plans, shall be waterproofed with Winslow's Hydrolithic Cement Coatings, applied by THE HYDROLITHIC WATERPROOFING CO., INC. All surfaces, before waterproof coating is applied, shall be thoroughly roughened and cleaned. Wall coating shall be 5/8 in. thick, applied in three coats, a slush coat, scratch coat, and finish coat. Wall coat may be finished with a wooden float or with a steel trowel to a straight even finish, free from pit holes, catfaces or other imperfections.

Floor work shall be 1 in. in thickness and may be finished same as wall slab, replacing the ordinary 1 in. topping coat, and shall serve as a wearing surface as well as a waterproofing agent.

Guarantee—THE HYDROLITHIC WATERPROOFING CO., INC., shall furnish a written guarantee covering their work for a period of three years. During this time they shall, at their own expense, promptly repair any leaks which may develop; providing such leaks are not due to structural changes in the building or to external damage to the waterproofing for which they are not responsible.



H. J. Heinz Auditorium, Pittsburgh, Pa.
ALBERT KAHN, Architect



Cathedral of St. John the Divine, New York, N. Y.
CRAM & FERGUSON, Architects

Representative Contracts

Banks

BUILDING AND LOCATION	ARCHITECTS
Braddock National Bank, Braddock, Pa.	Press C. Dowler
Bridgeport Trust Co., Bridgeport, Conn.	A. Freeman
Central Hanover Bank & Trust Co., New York, N. Y.	Geo. F. Pelham
Chase National Bank, New York, N. Y.	
Chicopee Falls Savings Bank, Chicopee Falls, Mass.	Hoggson Bros.
City Bank Farmers Trust Co., New York, N. Y.	Starrett & Van Vleck
Colonial Trust Co., Pittsburgh, Pa.	F. J. Osterling
Exchange Nat'l Bank, Pittsburgh, Pa.	Weary & Alford
Mellon National Bank, Pittsburgh, Pa.	Trowbridge & Livingston
Michigan City Trust, Michigan City, Ind.	Hoggson Bros.
National Exchange Bank, Roanoke, Va.	Wyatt & Nolting
New York State National Bank, Albany, N. Y.	M. T. Reynolds
Peoples National Bank, Jackson, Mich.	Rocker & Vatet
Third National Bank, Springfield, Mass.	Starrett & Van Vleck

Buildings

Bell Telephone Buildings, Various Cities	Voorhees, Gmelin & Walker
Brooklyn Borough Gas Co., Coney Island, N. Y.	Bloch & Hesse
Delaware & Hudson Building, Albany, N. Y.	M. T. Reynolds
Fifth Avenue Building, New York, N. Y.	Maynicke & Franke
Jos. Horne Store, Pittsburgh, Pa.	Benno Janssen
National Bible Institute, New York, N. Y.	Voorhees, Gmelin & Walker
Pennsylvania Traffic Building, Johnstown, Pa.	Hunting Davis & Dunnells
Pittsburgh Plate Glass Co., Long Island City, N. Y.	
Professional Building, Pittsburgh, Pa.	Hunting, Davis & Dunnells
Public Service Building, Baltimore, Md.	Parker-Thomas & Rice
Royal Bank of Canada, Liverpool, N. S.	Purdy & Henderson
Standard Sanitary Warehouses, Various Cities	
U. S. Post Office, Asbury Park, N. J.	Treas. Dept. U. S. Government

Churches

First Church of Christ, Scientist, East Orange, N. J.	H. B. Crosby
St. Pauls Cathedral, Pittsburgh, Pa.	E. J. Weber
Cathedral of St. Johns, New York, N. Y.	Cram & Ferguson

Clubs

Piping Rock, Locust Valley, N. Y.	
The Hangar, New York, N. Y.	Cross & Cross
University Club, Pittsburgh, Pa.	
Y. M. C. A., Governors Island, N. Y.	May & Hillard

Colleges and Schools

Carnegie Tech, Pittsburgh, Pa.	Palmer & Hornbostel
Catholic Boys High School, Pittsburgh, Pa.	Edward A. Link
Hamilton College, Clinton, N. Y.	Bagg & Newkirk
Julia Richman High School, New York, N. Y.	Dept. of Education
New York Trade School, New York, N. Y.	Wm. Miltenberger

Hotels

BUILDING AND LOCATION	ARCHITECTS
Hotel Holley, New York, N. Y.	Winkleman & Lyons
Hotel St. Moritz, New York, N. Y.	
William Penn, Pittsburgh, Pa.	Janssen & Cocken

Hospitals

Beth Israel Hospital, Newark, N. J.	Frank Grad
Columbia Hospital, Wilkinsburg, Pa.	J. L. Beatty
Home for the Old Men and Aged Couples, New York, N. Y.	Eric Kebbon
Home for Incurables, New York, N. Y.	Crow, Lewis & Wick
Manhattan Eye & Ear, New York, N. Y.	York & Sawyer
St. Luke's Hospital, New York, N. Y.	
Rockefeller Institute, New York, N. Y.	
U. S. Marine Hospital, Staten Island, N. Y.	Treas. Dept. U. S. Government

Manufacturing Plants

Chocolat-Menier Factory, Hoboken, N. J.	Ballinger Co.
B. F. Goodrich Co., Akron, Ohio	Purdy & Henderson
National Biscuit Co., Pittsburgh, Pa.	Own Architect
Pittsburgh Coal Co., Mine Shafts Mine Shafts, Pittsburgh, Pa.	
Pittsburgh Plate Glass Co., Ford City, Pa.	Own Architect
Scovill Mfg. Co., Waterbury, Conn.	Hugh Thompson
Victor Talking Machine Co., Camden, N. J.	Ballinger & Perrot
Yale & Towne Mfg. Co., Stamford, Conn.	Jas. Gamble Rogers

Residences

Cortlandt F. Bishop, New York, N. Y.	F. N. Breed
W. L. Brann, Austerlitz, N. Y.	E. Dean Parmelee
R. Fulton Cutting, New York, N. Y.	Delano & Aldrich
Anthony J. Drexel, New York, N. Y., and Arkville, N. Y.	Hoppin & Koen
Mrs. Grace Dodge, New York, N. Y., and Madison, N. J.	
Geo. J. Gould, New York, N. Y., and Lakewood, N. J.	Hoppin & Koen
Mrs. Frederick Guest, Roslyn, N. Y.	Grosvenor Atterbury
E. S. Harkness, New York, N. Y., and New London, Conn.	Jas. Gamble Rogers
Chas. T. Lovering, Little Silver, N. J.	John C. Greenleaf
Hubert T. Parson, Long Branch, N. J.	Horace Trumbauer
John D. Rockefeller, Pocantico Hills, N. Y.	
Mrs. H. L. Satterlee, Greenwich, Conn.	H. W. Rowe
H. McK. Twombly, Madison, N. J.	Tribus & Massa

Shipyards and Docks

League Island Navy Yard, Philadelphia, Pa.	U. S. Government
New York Dock Co., Brooklyn, N. Y.	
New York Harbor Dry Dock Co., Staten Island, N. Y.	
Pier 2 North River, New York, N. Y.	Dept. of Docks
Pier F North River, Penn. R. R., Jersey City, N. J.	Pennsylvania R. R.
Pier 34 North River, New York, N. Y.	Dept. of Docks

HEADLEY EMULSIFIED PRODUCTS COMPANY

SUCCESSOR TO HEADLEY GOOD ROADS COMPANY (ESTABLISHED 1908)
Franklin Trust Building, PHILADELPHIA, PA.
NEW YORK, N. Y., Chrysler Building CHICAGO, ILL., One LaSalle Street Building
MAIN PLANT: MARCUS HOOK, PA
Stock carried in over 100 Industrial Centers

Headley Asphalt Products

Headley Asphalt Products are made by one of the oldest and largest manufacturers of emulsified asphalts and meet existing engineering standard specifications for dampproofing, waterproofing and protective coatings.

HEADLEY Emulsified ASPHALTS
REG U S PAT OFF

Headley Emulsified Asphalts—For industrial uses. Protective coatings for concrete, masonry, structural steel, pipe lines, metal, etc., against the destructive influences of fresh and salt water, moisture, gases, chemical fumes, brine, acids and alkalis, etc. Protection of concrete and masonry against disintegration. Dampproofing and waterproofing of foundations, basements, reservoirs, sumps, pits, cisterns, vats, tanks, floors, walls, roofs, etc. Bonding and cementing bituminous flooring, linoleum, plaster, stucco, tiles, blocks, slabs, bituminous bridge and crossing planks, fibrous and mineral wall boards, corkboard and other insulation. Paving and patching of highways, walks, airport runways, railway platforms and crossings, industrial floors, etc. Marking traffic zone lines for highways and streets.

Headley Asphalt-base Aluminum (Not Emulsified)—For general protective coating of metal, concrete, wood, fabric, etc.; increasing light reflection from all dark surfaces; for reducing temperature variation in storage tanks, tank cars, etc., thus reducing loss of volatile contents during periods of intense heat.

Headley Saturated Cotton Fabric—For membrane waterproofing, roofing, etc.

Headley Emulsified Asphalts

Headley Emulsified Asphalts consist of selected grades of straight steam-distilled Mexican asphalt finely dispersed, all of the minute particles being individually enclosed within a soapy film which prevents them from coalescing or sticking together while in emulsion form. The asphalt particles are completely and uniformly dispersed and remain so until the emulsion is applied. On application, the film of soap solution enclosing each asphalt particle quickly breaks, due to physicochemical changes as well as evaporation of water, and the particles unite to form a uniform continuous coating of pure asphalt, tacky or non-tacky as desired.

The superiority of Headley Emulsified Asphalt comes primarily from (a) the high content of specially selected asphalt base, (b) the small amount and advantageous nature of the soap emulsifier, (c) the low water content, (4) cold application, (e) resistance to destruction by freezing, (f) bond to wet or moist surfaces, (g) freedom from appreciable sedimentation, and (h) imperviousness after setting up.

Headley Emulsified Asphalts Combine All These Further Advantages—Applied cold (at temperatures above 35° F.) spread evenly by flowing, spraying, brushing or squeegee. No heating kettle, no cutting of drums and material. No skilled labor or tedious mopping required.

Standard grades with different characteristics afford a choice for specific requirements.

Can be applied (a) as is, (b) diluted with clear water (not over ½ pt. per gal.), or (c) mixed with various inert fillers or aggregates all of which should be thoroughly wet with water before admixture. Special grades mixed with filler or aggregate to form a mastic can be troweled, tamped or rolled.

Bonds perfectly to any clean surface, wet or moist, assuring complete protection. No priming coat required. Small particle size assures maximum penetration.

Not injured by freezing. Can be stored in unheated warehouses.

The small amount and advantageous nature of the soap emulsifier.

No ingredient impairs ductility, bonding or imperviousness of the finished coating.

Useful properties fully retained. No beneficial physical properties of the asphalt are impaired or permanently lost by the emulsification process.

Emulsion film breaks and coating sets almost immediately on application. Will not re-emulsify after setting up.

Very stable. No appreciable sedimentation or separation on long storage.

No flammable or toxic fumes to endanger health in unventilated locations. No dangerous solvent to create fire hazard.

Odorless and tasteless. No contamination of food, or water, etc., in refrigerators, tanks, etc.

Efficient and permanent. Apply uniformly, set readily, dry in a few hours and thereafter thoroughly resistant to temperature changes, water, acids, alkalis, and other corrosive agents. Form a continuous coating of pure asphalt, remain ductile and will not crack, creep or flow under ordinary exposure conditions.

Standard Grades Headley Emulsified Asphalts

No. 10—Tacky finish for general dampproofing, waterproofing and protective coating purposes.

No. 10-A—Tacky finish for heavy coating and cementing purposes.

No. 11—Non-tacky finish for general dampproofing, waterproofing and protective coating purposes.

No. 12—Plaster bond; for plaster, mortar and stucco.

No. 1, No. 3 and No. 6—Paving binders for summer application.

No. 2 (Viafalt)—Paving binder for winter application.

No. 5 Headley Zone-Marking Emulsion—Black and Yellow—for marking traffic zone lines on streets and highways.

Shipped in 50 to 55-gal. or 30 to 33-gal. steel drums or 5-gal. steel pails.

Special grades prepared for special uses.

Headley Asphalt Saturated Cotton Fabric No. 90 for Membrane Waterproofing

A special woven cotton fabric saturated with pure selected asphalt which meets A. S. T. M. Specifications. Is used in connection with Headley Emulsified Asphalts or hot-applied asphalts to form a waterproofing membrane. Is flexible, conforms to surface irregularities, is elastic, is of sufficient tensile strength to resist breaking or weakening of the seal in case of cracking, opening of joints or shifting of masonry, reinforces adjacent material, and provides a permanently impervious membrane.

Weight no less than 11 oz. per sq. yd. Shipped in 100-yd. rolls of 36-in. width.

Headley Asphalt-base Aluminum No. 30

Headley Asphalt-base Aluminum Coating (not emulsified) consists of aluminum flakes and pure refined Mexican Asphalt with enough liquifier added to produce good application consistency.

On application, the aluminum flakes float to the top surface, then the liquifier evaporates leaving a uniform continuous deposit of asphalt covered with a continuous armor coat of metallic aluminum. The finished coating remains efficient, elastic, and will not crack or creep under ordinary atmospheric temperatures. The aluminum gives maximum protection to the asphalt base and lengthens its useful life.

Shipped in 5 or 1-gal. steel pails, or larger containers if desired.

Instructions for Applying Headley Emulsified Asphalts

(1) As Protective Coatings Over Iron, Steel or Other Metals—Against corrosion by weather, water, acids, alkalis. Clean surfaces thoroughly of all loose material. Brush or spray first coat Headley Emulsified Asphalt No. 11, 70 to 80 sq. ft. per gal. After first coat is dry, one hour usually being sufficient, apply second coat, 50 to 60 sq. ft. per gal.

Suitable priming coats may be used if desired.

(2) For Dampproofing Exterior Walls and Foundations—Clean surface of all loose particles, dirt, mortar, etc. Apply first coat Headley Emulsified Asphalt No. 10 or 11, 70 to 80 sq. ft. per gal. After first coat is thoroughly dry, one hour usually being sufficient, apply second coat, 50 to 60 sq. ft. per gal. Backfill can be made as soon as second coat has set up. Dry and porous surfaces should be thoroughly moistened before application of the material.

(3) Plaster Bonding and Dampproofing on Brick, Tile, Concrete, Stucco, etc.—Apply first coat of Headley Emulsified Asphalt No. 12 (Plaster Bond), 70 to 80 sq. ft. per gal. After first coat is thoroughly dry, one hour usually being sufficient, apply second coat, 50 to 60 sq. ft. per gal. After second coat has set up for 24 hours or longer, plaster finish may be applied where desired. Dry and porous surfaces should be thoroughly moistened before application of the material.

(4) For Waterproofing Parapet Walls—Two brush coats are recommended using 1½ to 2 gal. per 100 sq. ft. per coat of Headley Emulsified Asphalt No. 11.

(5) Backing Cut Stone—Apply Headley Emulsified Asphalt No. 11 on the back and edges (not nearer than 1½ in. from the face) of the individual stones; also on the back of the limestone veneer or on the face of the back wall. Dampen back and edges of stone before applying material.

(6) Dampproofing New Concrete Floors—After rough pour of concrete, brush clean of all loose particles and if dry, dampen. Apply Headley Emulsified Asphalt No. 11, 50 to 60 sq. ft. per gal. by brush or squeegee. After first coat has set up, one hour usually being sufficient, apply second coat of Headley Emulsified Asphalt No. 11, 50 to 60 sq. ft. per gal. As soon as second coat has been applied, pour top layer of concrete.

(7) Concrete Floor Repairing—Blow cracks in floors free from dust and chip out, if necessary. Dampen with water. Use Headley Emulsified Asphalt No. 10 or No. 11 and work into dampened surfaces with fibre brush, applying two or three coats one-half hour to one hour apart. If crevices are deep after application as above, fill crevices about one-half full of damp sand, using No. 14 mesh for smaller crevices or No. 8 for larger ones. Then pour Headley Emulsified Asphalt No. 10 or No. 11 over the sand and after 15 or 20 minutes tamp down and fill upper part of the crevices in like manner with No. 11.

In cases of large areas to be treated, the crevices may be covered longitudinally with 1-ply Headley Saturated Asphalt Fabric laid in Headley Emulsified Asphalt No. 11. allowing the first coat to dry one-half to one hour. Then lay down fabric and cover with second coat, thoroughly brushing the softened fabric free from folds and wrinkles. The entire floor area may be covered in this manner with Headley Saturated Asphalt Fabric. A working surface of cold mastic ½ to ¾ in. thick may be laid on top of this membrane using Headley Mineral Emulsion.

(8) Coating Old Roofs—Asphalt, Felt, Tar, Gravel, etc.—Clean roof of all foreign material, loose gravel, cinders, etc. Give areas to be patched a heavy coat of Headley Emulsified Asphalt No. 10, extending from 3 to 6 ins. beyond the edge of the patch. Allow to stand until material is thoroughly dried out, one hour usually being sufficient, then brush or press down a layer of roofing felt or Headley Asphalt Saturated Fabric. Then cover with a heavy coating of Headley Emulsified Asphalt No. 11, using 3 gal. per 100 sq. ft.

If roof is old or felt has dried out, first coat may be absorbed to such an extent that a second coat of Headley Emulsified Asphalt No. 11 should be applied, using 2 gal. per 100 sq. ft.

(9) Laying Headley Asphalt Saturated Fabric (Waterproofing Membrane)—Surface must be fairly smooth, free of all foreign materials. Clean with wire brush, if necessary. Very dry surfaces should be dampened. Apply first coat of Headley Emulsified Asphalt No. 11, 50 to 60 sq. ft. per gal. and allow to set up from one-half to one hour. Lay down first layer of Headley Asphalt Saturated Fabric, brushing over with a second heavy coating of Headley Emulsified Asphalt No. 11, 50 to 60 sq. ft. per gal., and brush the softened fabric free from folds and wrinkles. For two-ply membrane allow to dry for one hour and cover with second layer of Headley Asphalt Saturated Fabric with side lap of 2 ins. and end lap of 12 ins. Then apply the third coating of Headley Emulsified Asphalt No. 11, 40 to 50 sq. ft. per gal., brushing the softened fabric free from folds and wrinkles. When the material is dry, the weave of the fabric should be completely covered by the emulsion.

(10) General—For brushing, fibre brushes (Tampico, etc.) are recommended. All brushes should be wet thoroughly with gasoline or kerosene before using. Shake out and then wet with water before starting application. After application, brushes should be cleaned with gasoline or suitable solvent.

Almost any make of Emulsified Asphalt spray gun can be used. Use not less than 85-lb. air pressure for the above-mentioned materials to insure complete atomizing of the asphalt.

Engineering Service

On request, we will mail specifications covering standard applications, assist in drawing up unusual specifications, advise as to correct selection and application, or undertake investigations in connection with problems involving the use of emulsified asphalts.

Literature

Bulletin 131—Analytical Specifications—Road Emulsions.

Bulletin 230—Typical Applications of Headley Emulsified Asphalts.

Bulletin 330—Waterproofing, Dampproofing, and Protective Coatings.

Bulletin 430—Headley Asphalt-base Aluminum Coating.

Bulletin 730—Analytical Specifications—Industrial Emulsions.

Any of these will be mailed on request.

ESTABLISHED 1889

H. B. FRED KUHLS

Manufacturer of Kuhls' Elastic Waterproofing Pointing and Surface Compositions

OFFICE AND FACTORY

6411-6423 Third Avenue, BROOKLYN, N. Y.

AGENTS HAVING STOCKS

CHARLESTON, S. C., Wm. M. Bird & Co., 205 E. Bay Street
CHICAGO, ILL., N. J. Bique & Son, 126 W. Grand Avenue
CHICAGO, ILL., Athey Co., 24th and La Salle Streets
CLEVELAND, OHIO, Upson-Walton Co., 1310 W. 11th Street
DALLAS, TEX., Lingo Lumber Co., San Jacinto Street
DULUTH, MINN., Thomas Williams Co., 114 Lake Avenue
JACKSONVILLE, FLA., Geo. E. Chase & Co., 325 E. Bay Street
LOS ANGELES, CAL., W. C. Lea, 653 So. Clarence Street
LOS ANGELES, CAL., California Minwax Corp., 1322 So. Los Angeles Street
NEW YORK, N. Y., Weinstock Bros., 384 Third Avenue
OMAHA, NEB., G. H. Alwine Co.
PHILADELPHIA, PA., E. Webb & Son Co., 136 So. Front Street
PITTSBURGH, PA., Fort Pitt Mfg. & Supply Co., 116 7th Street
PORTLAND, ORE., Beebe Co., First and Washington Streets
SAN FRANCISCO, CAL., C. J. Hendry Co., 25 Main Street
SEATTLE, WASH., F. W. Farrington & Co., L. C. Henry Building

Products

ELASTIC POINTING UP COMPOSITION—For joints in copings, tops of cornices and flashings, joining of tin roofs to walls and all other projecting courses in stone or terra cotta work.

ELASTIC SEAM COMPOSITION—For expansion joints in terrazzo tile roofs, swimming pools, etc. For all joints on a horizontal plane that are subject to expansion and contraction.

ELASTIC EXPANSION JOINT COMPOSITION—For joints in tile roofs, domes, etc. All joints on an incline where a great deal of expansion and contraction takes place.

ELASTIC TILE BEDDING COMPOSITION—For bedding slate and tile roof.

ELASTIC WATERPROOF COATINGS—For outside walls and foundations.

For Kuhls' Elastic Glazing and Caulking Compositions, see Manufacturers' Index.

Kuhls' Elastic Waterproofing Compositions

Elasticity—Kuhls' Elastic Waterproofing Compositions never become hard or brittle. They never crack or crumble, always remain elastic and flexible, withstand heat, cold, moisture, excessive vibration, gases, fumes and rapid changes of temperature, and always make a weathertight joint.

Bond—Kuhls' Elastic Waterproofing Compositions will adhere strongly to galvanized and raw iron, steel, wood, glass, stone, concrete, terra cotta, tin, copper or any other material.

Colors—The stock colors are light gray and white, but Kuhls' Elastic Waterproofing Compositions can be manufactured in any color to harmonize with the color of the structural material at no extra charge. *These colors do not stain.*

Consistency—Kuhls' Elastic Waterproofing compositions are made for use with a trowel, knife or gun.

How Shipped—Put up in cans of 1, 2 and 5 lb.; in drums of 12½, 25, 50 and 100 lb.; in half-barrels of 100 to 500 lb.; and in barrels of 700 and 800 lb.

Service—H. B. FRED KUHLS have in their employ men experienced and trained in their respective lines to co-operate in the fullest measure with architects, engineers and contractors. They offer a complete and efficient service in the use of Kuhls' Elastic Waterproofing Compositions.

To assist architects located in the west, H. B. FRED KUHLS refer them to their west coast representatives, the California Minwax Corporation, 1322 So. Los Angeles Street, Los Angeles, Cal., and F. W. Farrington & Co., L. C. Henry Building, Seattle, Wash., who have a staff of trained waterproofing engineers who will gladly furnish any information and samples without obligation.

Specifications—***Pointing Up Stone, Terra Cotta and Flashings***—The joints shall be cleaned out thoroughly, and painted with Kuhls' Elastic Joint Paint. The joints shall then be filled with Kuhls' Elastic Pointing Up Composition with a pointing tool, knife or gun. Colors can be obtained to match the stone or terra cotta.

Note: The Elastic Joint Paint should always be used in the joints first, as it is especially prepared to prevent absorption of the oil in the Elastic Pointing Up Composition by the adjoining materials.

Pointing Joints in Copings, Tops of Cornices or Other Projecting Courses in Stone or Terra Cotta Work—The cross joints of all coping courses, tops of cornices or other projecting courses in stone or terra cotta work shall be raked out clean of all portland cement mortar for a depth of at least ¾ in. Sides of joints shall then be thoroughly painted with one or two coats of Kuhls' Elastic Joint Paint (manufactured by H. B. FRED KUHLS, Third Avenue and 65th Street, Brooklyn, N. Y.) or until the surface shows a gloss. The joints shall then be filled with Kuhls' Elastic Pointing Up Composition thoroughly worked and pressed into the joint, to fill the entire joint, and shall be neatly finished flush with adjoining surface. Color of Kuhls' Elastic Pointing Up Composition shall be of the color as selected by the architect.

Kuhls' Elastic Seam Composition for Expansion Joints

Especially adapted when used with Kuhls' Elastic Joint Paint for expansion joints in promenade roofing tile, swimming pools, concrete work, all joints on a horizontal plane, etc. It has been successfully used on the terraces of the Capitol at Washington, Army Base in Brooklyn, and for other prominent buildings, bridges, railroad work, etc. Exposure to sudden and extreme changes of temperature, as well as movement and vibration, does not affect it. It will remain elastic and stick to the sides of the joints for many years. The joint must always be painted with Kuhls' Elastic Joint Paint before applying the Elastic Seam Composition in order to secure the best results.

Specifications—Expansion joints shall be provided in promenade tile roofing where noted on drawings. All expansion joints shall be cleaned out down to the waterproofing course. After this, one or two coats of Kuhls' Elastic Joint Paint shall be applied, or until the surface of the joint shows a gloss. Then the joint shall be pointed up with Kuhls' Elastic Seam Composition, thoroughly working the material into the joint to fill the space. Finish shall be left crowned above the adjoining surfaces.

Kuhls' Elastic Expansion Joint Composition

Should be used in all joints on an incline where a great deal of expansion and contraction takes place. Used in joints on domes, faces of clocks, tile roofs, monuments, bridges, etc.

Specifications—All expansion joints shall be cleaned out down to the waterproofing course. One or two coats of Kuhls' Elastic Joint Paint shall be applied, or until the surface of the joint shows a gloss. Then the joints shall be pointed up with Kuhls' Elastic Expansion Joint Composition, thoroughly working the material into the joint to fill the entire space. The finish shall be left crowned above the adjoining surfaces.

Kuhls' Elastic Seam and Joint Paint

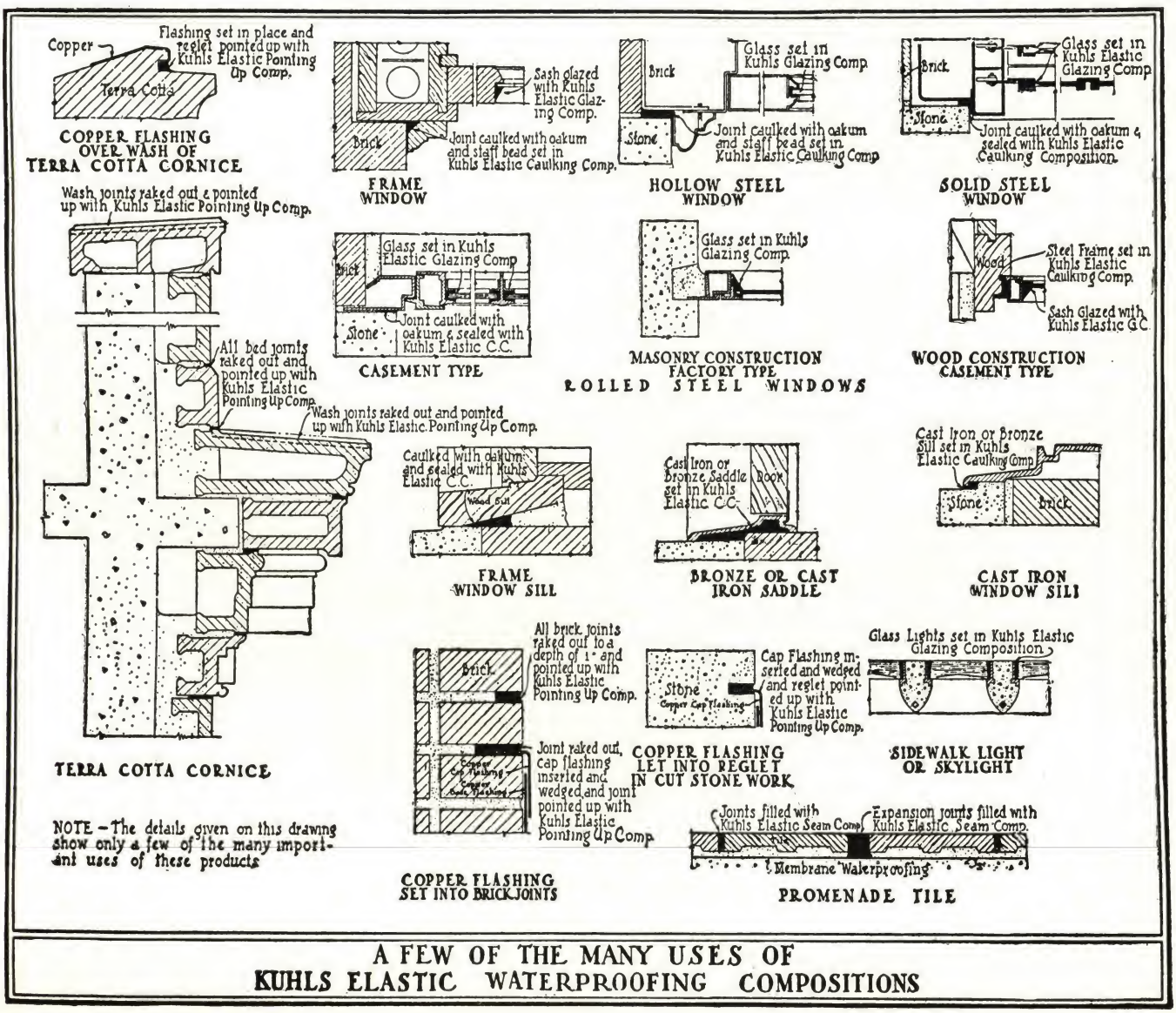
These paints are made especially for use with Kuhls' Elastic Waterproofing Compositions and should always be specified to be applied as follows: Seam Paint for wood, and Joint Paint for stone and terra cotta, etc., as it preserves the composition, preventing the oil from being absorbed by adjoining material. These paints dry in about 10 minutes. Shipped in ½-pt., 1-pt., 1-qt., ½-gal. and 1-gal. cans.

A Few Buildings on Which Kuhls' Elastic Waterproofings Have Been Used

Northern Swimming Pool, Madison, Conn.
Seamen's Institute, Newport, R. I.
Boston & Albany Railroad, Worcester, Mass.
Baker Library, Harvard University, Boston, Mass.
Arlington Memorial Bridge, Washington, D. C.
Army Supply Base, Brooklyn, N. Y.
Rhinelander Building, New York, N. Y.
Williamsburg Savings Bank, Brooklyn, N. Y.
Biltmore Hotel, Los Angeles, Calif.
Pader Pelton Building, Los Angeles, Calif.
Plaza Hotel, New York, N. Y.
B'nai B'rith Temple, Los Angeles, Calif.
Western Union Building, New York, N. Y.
Woolworth Building, New York, N. Y.
Pennsylvania Terminal, New York, N. Y.
New York Central Railroad, New York, N. Y.
No. 1 Wall Street Building, New York, N. Y.
Chrysler Building, New York, N. Y.

Some Architects Who Have Specified Kuhls' Elastic Waterproofings

J. C. Austin, Los Angeles, Calif.
Allied Architects, Los Angeles, Calif.
Charles P. Baldwin, New York, N. Y.
Claude Beelman, Los Angles, Calif.
Carrère & Hastings, New York, N. Y.
Cass Gilbert, New York, N. Y.
Halsey, McCormack & Helmer, Inc., New York, N. Y.
Koch & Wagner, Brooklyn, N. Y.
Lee & Hewitt, New York, N. Y.
Meyer & Hunt, Los Angeles, Calif.
McKim, Mead & White, New York, N. Y.
George B. Post & Sons, New York, N. Y.
Palmer & Hornbostel, New York, N. Y.
Charles A. Platt, New York, N. Y.
Sugarman & Berger, New York, N. Y.
Warren & Wetmore, New York, N. Y.
Isaac A. Allen, Jr., Hartford, Conn.
Voorhees, Gmelin & Walker, New York, N. Y.



A FEW OF THE MANY USES OF KUHLS ELASTIC WATERPROOFING COMPOSITIONS

W. H. LOOMIS TALC CORPORATION

Manufacturers of "LOOMITE" for Improving Concrete

GOUVERNEUR, N. Y.

REPRESENTATIVES IN NEW YORK, CHICAGO AND BOSTON

"LOOMITE"—THE MATERIAL THAT IMPROVES CONCRETE

"Loomite" in a finely subdivided aggregate manufactured from a chemically inert, sound, crystalline rock containing about 10% calcium silicate having a hardness of about 5-5.5, specific gravity of 2.85-3 and a melting point of about 2650°F.

Except for a very slight solubility of the calcium silicate, the rock is chemically inert, not being acted upon by ordinary acids or alkalis. In concrete, "Loomite's" main function is mechanical.

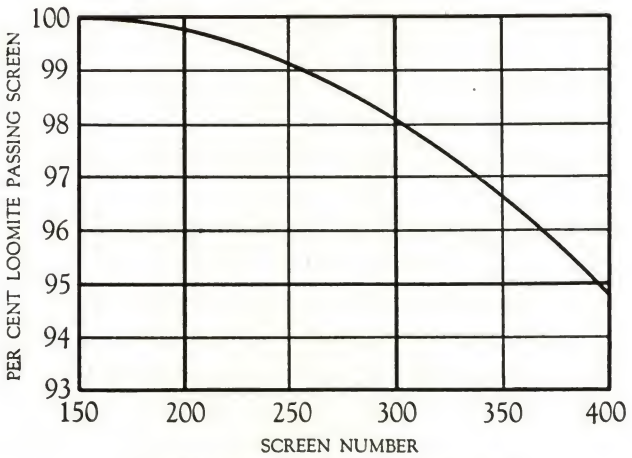


Chart Showing Fineness of "Loomite"

"Loomite" is ground to such inpalpable fineness, (in fact, 21 times as fine as cement), that it fills the voids of dry cement, giving a better bond between the other aggregates and the cement. It is air-floated, a process which insures a uniformly fine product. It is not a colloidal substance but an unalterable crystalline rock, possessing the physical properties of the other aggregates together with smoothness.

THE EFFECT OF "LOOMITE" ON CONCRETE

Waterproofing

Mixing a proper amount of "Loomite" with the other aggregates in concrete and mortar, a very dense concrete is formed. The "Loomite", being much finer than cement, fills the voids, thus forming an exceedingly dense concrete which resists passage of water.

Workability

While there is at present no accepted test which measures true workability, "Loomite" tends to fatten the concrete mix, making it more plastic and preventing segregation. The lubrication provided by "Loomite" results in quicker flow through or from chutes, mixers, barrows, etc. "Loomite" gives to concrete a smoothness of real cash value to contractors as it can be chuted into place at a flatter angle, for longer distances, without free water or segregation, and a greater yardage can be handled at the same cost. It also aids in making the concrete flow around the corners or edges of forms; between and around reinforcing rods. The use of less water to obtain greater workability follows the theory of water-ratio, producing a concrete upon which there is less laitance and the surface of which is free from air-bubbles and "honeycomb".

"Loomite" produces an acid-resisting, smooth, workable mortar of undiminished strength that gives added speed to bricklaying.

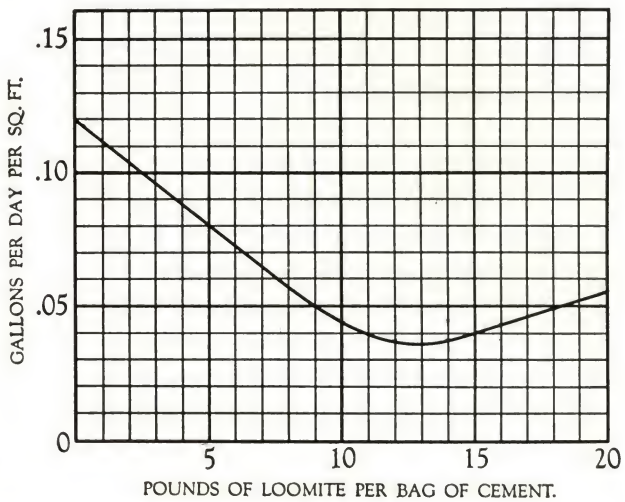


Chart Showing How "Loomite" Affects Permeability of Concrete

Increases Acid and Fire Resistance

The addition of "Loomite" to the fine aggregates results in a dense, hard finished concrete. Because of the chemical inertness of the "Loomite" itself, it greatly increases the resistance to acids and alkalis (sea water) and because of its heat-resisting qualities, tends to eliminate spalling of concrete due to exposure to intense heat, thereby protecting metal reinforcing, steel posts and girders.

Increases Compressive Strength

It has been determined by careful study, over a period of years, that the use of "Loomite" as an additional aggregate in concrete increases the workability, prevents segregation, waterproofs and increases the fire, acid and alkali resistance, *without reducing the compressive or tension strength.*

The tables below will quickly show there is no reduction in strength, in fact a slight increase is shown, especially in the 7-day and 28-day tests. This, however, is not important. What is important is that the aforementioned qualities are obtained by the addition of "Loomite" to the aggregate *without sacrifice of strength.*

In conducting these tests the water-cement ratio was strictly adhered to, using W÷C=1.12 for the 1:7, -0.95 for the 1:6 and 0.90 for the 1:5 mix, adding to each, an amount of water equal to 0.35 the weight of "Loomite" to allow for absorption and keep the slump and flow constant.

When "Loomite" is used with portland cement the compressive strength is inversely proportional to the ratio W÷(C+L) rather than the ratio W÷L. In the case of stiff mixes, it is necessary to allow for the absorption of the "Loomite" (about 35% by weight) but in the case of soupy mixes no extra water is needed. In fact the water might be reduced and still produce a more workable concrete.

RESULTS OF COMPRESSIVE TESTS USING AS AN ADDITIONAL AGGREGATE 50 LBS. LOOMITE PER YARD CONCRETE

Mix	Field mix	Pounds Loomite per bag	Compressive strength		
			7-day	28-day	1-year
*1:5	1:2.4:3.6	None 9.5	1323 1532	2184 2204	3528 3634
1:6	1:2.7:4.5	None 11.3	1211 1405	2148 2377	3054 3112
1:7	1:3.7:4.7	None 13.2	728 886	1481 1751	2453 2458

*New York State Highway
Note: The upper figure is for plain concrete. The lower figure is for Loomite Concrete.

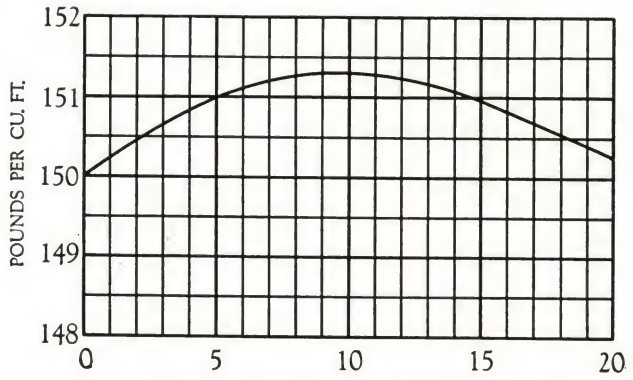


Chart Showing Increase of Density of Concrete by Use of "Loomite"

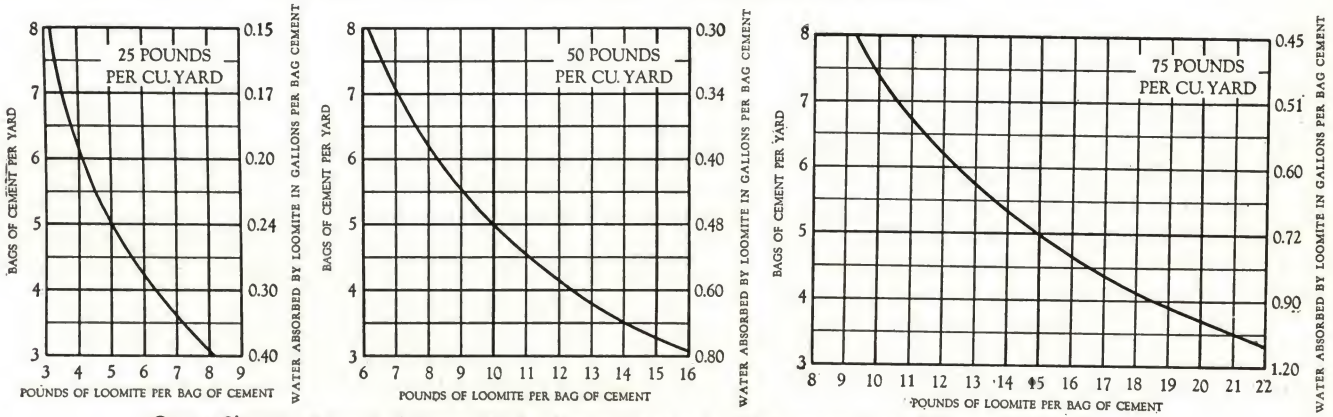
Increases Density

The use of "Loomite" increases the density of concrete as is shown by the accompanying curves showing the variations in density in proportion to the quantity of "Loomite" used. This increased density is vitally important in highways and garage floors. The sand grains are held in place by the "Loomite" and have to be worn down instead of being dislodged in traffic. This density resists penetration of motor oils.

DIRECTIONS FOR USE OF "LOOMITE"

"Loomite" because of the fact that it is another aggregate, should be introduced into the mix either before or with the cement. There need be no greater attention given it than is given to any of the aggregates. Because of its inertness and other characteristics, it is absolutely harmless to those who handle it.

To obtain all the benefits accruing from the use of "Loomite", we recommend 50 lbs. to the cubic yard; for waterproofing and workability, 30 lbs. per cubic yard of concrete with suffice.



Curves Showing Amount of "Loomite" Per Bag of Cement for Different Weights of "Loomite" Per Cubic Yard
Also shows amount of water absorbed by "Loomite" which must be added to give same water ratio

Shipment and Cost

Shipment of "Loomite" is made usually in bags containing 50 lbs. of the material. The price of the material is uniform f.o.b. Emeryville, N. Y.

Our Consultation Service

We maintain, without additional cost to the users of "Loomite", a testing laboratory and a staff of consulting engineers. These services are placed at your disposal immediately upon request.

Where "Loomite" Has Recently Been Used

"Loomite" has been successfully used in tunnel linings, mine shafts, seawalls, mine walls, freight terminals, highways, garages, warehouses, hospitals, office buildings, churches, hydroelectric projects, reservoir walls, spillways, bridges, retaining walls, etc.

We have in our files, unsolicited letters of recommendation from railroads, State Engineering Departments, architects, contractors and bridge engineers. Copies of these are available on request.

LEWIS ASPHALT ENGINEERING CORPORATION

SUCCESSORS TO GARDINER AND LEWIS, INC.

ENGINEERS AND MANUFACTURERS

Specializing in Protection Against Water and Corrosion

30 Church Street, NEW YORK, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

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Karnak Membrane Waterproofing System

The Karnak system is based on the use of a highly refined and very ductile asphalt, reinforced and held in place by a strong elastic interlocking membrane, made of cotton cloth saturated with asphalt. Because Karnak asphalt contains no impurities or foreign matter and because this waterproofing is held in place by a strong elastic binder, less plies are required than in felt systems. In the usual case, 2 plies of Karnak fabric with 3 heavy moppings of Karnak asphalt will give absolutely adequate results.

KARNAK

Uses—This system will be found to be thoroughly dependable for use on building foundations, bridges, viaducts, pump wells, retaining walls and wherever construction is exposed to water pressure.

Karnak Asphalt—Melting point 150° to 160° F.; penetration at 32° F. not less than 10, at 115° F. not more than 100; ductility at 77° F. not less than 30 cm.; loss in weight and penetration under the standard A.S.T.M. heat test, less than 0.5% and 10% respectively.

Karnak Fabric—An elastic cotton fabric, thoroughly impregnated with Karnak Asphalt, having a minimum tensile strength of 50 lbs. per in. and a minimum stretch of 10% in either direction. The thread count shall be between 18 and 26 threads per inch assuring an open mesh. The raw weight shall be less than 4½ oz. and the saturated weight from two to three times the raw weight.

Architects' Specification — The waterproofing course shall consist of 2 plies of Karnak Fabric and 3 layers of Karnak Asphalt, applied in strict accordance with the manufacturer's directions.

Tests—Every lot of asphalt and fabric is tested at the source by an independent laboratory which places its seals and identification numbers on each package. A copy of this test will be sent directly to the architect by the testing laboratory.

Publications—We have bulletins covering all points: a technical discussion of bituminous waterproofing; lists of architects, engineers and railroads who use Karnak; lists of typical Karnak installations; detailed descriptions of some particularly interesting projects.

Karnak Cut-backs and Plastics—We make a complete line of primers, brush plastics, trowel plastics, joint fillers.

Karnak Special Purpose Asphalts—To meet the needs of manufacturers. State your needs to our Engineering Department.

Karnak Roofing—The same as the waterproofing blanket. Particularly adaptable for roofs protected with tile or concrete because the expansion of the surfacing will not tear the roofing blanket.

Krodeproof

A Preventive of Corrosion and a New Method of Applying Asphalt as a Waterproofing Agent—Krodeproof consists of minute particles of asphalt suspended in water together with a mineral dispersing agent. When applied to any surface, wood, steel or concrete, the water evaporates and there is left a composite structure of asphalt and agent particles which is actually more effective than pure asphalt.

KRODEPROOF
TRADE-MARK

Advantages—Krodeproof, being a dispersion of asphalt and water, is always applied cold and can be applied to damp or even wet surfaces with no loss in adhesive values. It can be applied with an air spray or brush; and it may be built up to any thickness. After the Krodeproof has set up it will not flow, bleed or run at any temperature up to 300° F.

Uses—Krodeproof is most effectively used wherever protection is required against moisture, acid or alkali fumes.

Users—Railroads; against locomotive gases, brine drip and on decks of concrete bridges, and retaining walls.

Marine; against salt water corrosion.

Contractors and engineers; against moisture below grade and for surfacing roofs.

Hydro-electric plants; on penstocks, transmission towers, etc.

Manufacturing plants; for lining coal bunkers, for lining acid chimneys, boiler setting compound, etc.

Cold storage and ice plants; for protecting insulation against moisture and air infiltration.

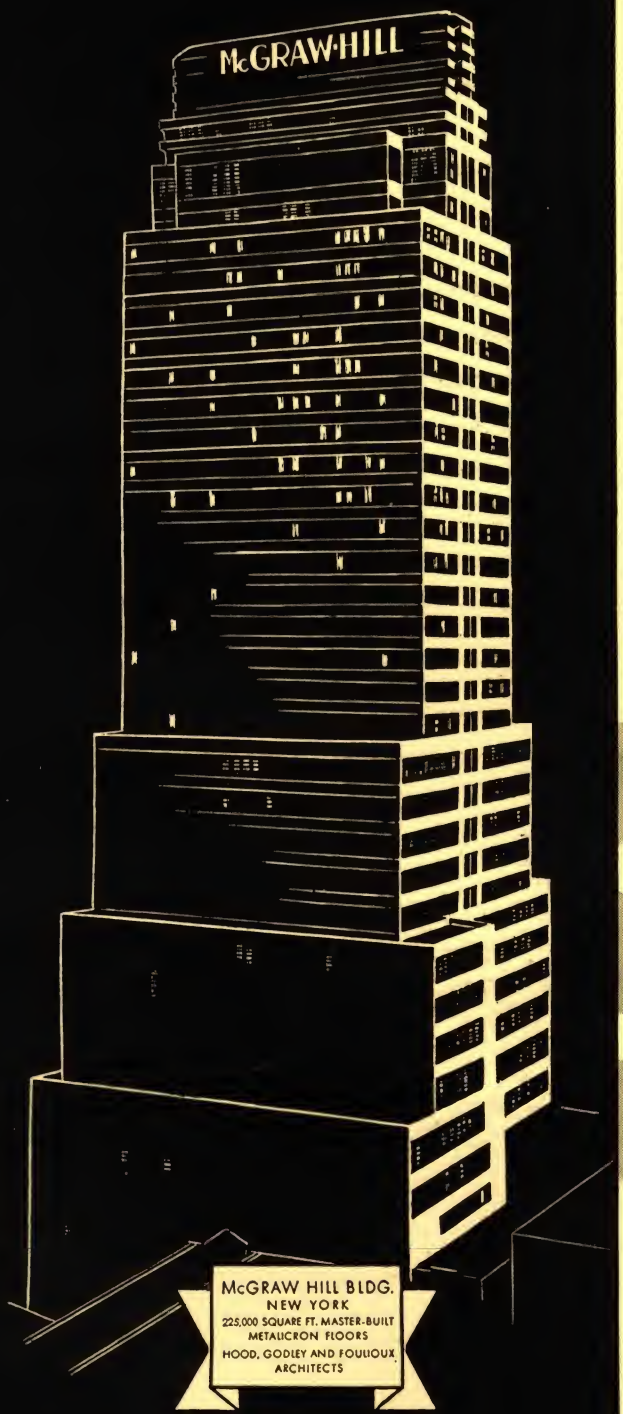
Korkseal

Korkseal is an asphalt plaster used for the protection of corkboard insulation. It is made from Krodeproof mixed with inert materials; which gives a creamy plastic, very easy to apply, firmly bonding to the corkboard—setting up into a tough rubbery protection coating which will not crack, and will not permit the penetration of air or moisture into the corkboard—thereby preserving the original usefulness of the insulating material.

KORKSEAL
TRADE-MARK

Engineers and contractors have found Korkseal more efficient, and less expensive. A representative list of installations will be sent on request.

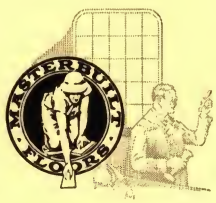
Refrigeration Specifications—To maintain efficiency of corkboard as an insulator, it must be kept dry; to do this it is necessary to keep all "live" air out of the corkboard. Therefore: (1) Prime masonry wall with Karnak Structural Primer. (2) Erect corkboard to the primed masonry wall with 180° M.P. Karnak Asphalt. (3) Prime corkboard with one coat of Krodeproof using 2½ to 3 gals. per 100 sq. ft. of corkboard surface. (4) Protect exposed surface with a ⅛-in. coat of Korkseal applied in two coats. Approximately 9 gals. of Korkseal per 100 sq. ft. required for two coat work. All of these materials to be applied strictly in accordance with the instructions of the manufacturer.



CONCRETE FLOOR HARDNERS

CONCRETE WATERPROOFINGS

ALLIED TECHNICAL PRODUCTS



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The

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Cleveland, Ohio

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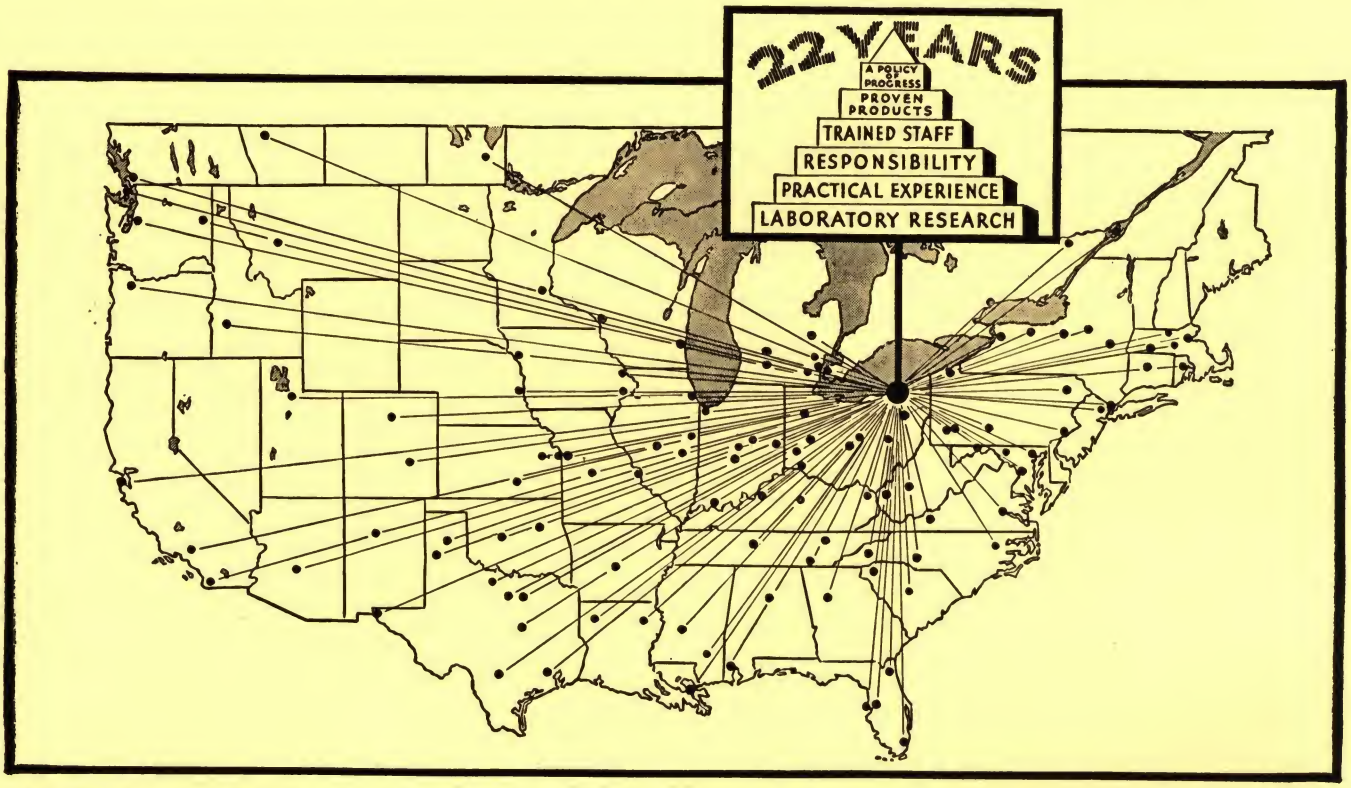
THE FACTS about those products in terms of the Architect's and Client's interests.
INTELLIGENT consulting and field service for the proper selection and use of products.
FULL COOPERATION before, during and after installation.
RESULTS . . . not promises.

THIS conception of our responsibility to the construction industry is the cornerstone on which The Master Builders Company was founded in 1910. To the support of these ideals for twenty-two years has been brought the best in brains, experience and integrity. During that period, over 600,000,000 sq. ft. of Masterbuilt Floors have been installed, giving us a breadth of experience unequalled in our field. That these policies will be maintained and the service program under them broadened as new and improved materials develop, is the promise of this organization to the building fraternity.

LEADERS IN THE CREATION OF NEW AND IMPROVED METHODS, WITH A NATION-WIDE ORGANIZATION OF CONCRETE SPECIALISTS TO SERVE YOU



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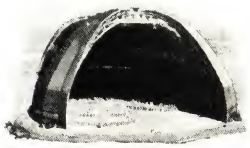
Merchandise Mart, Chicago
Graham, Anderson, Probst & White, Architects
5,000,000 sq. ft. Masterbuilt Floors



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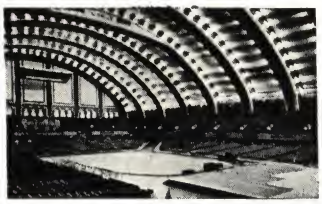
Goodyear Zeppelin Hangar, Akron
Wilbur Watson and Assoc., Arch.
Masterbuilt Floors Throughout



World's Largest Auditorium
Convention Hall, Atlantic City
Lockwood, Greene & Co., Engineers

New York Edison Co., New York
Private Plans.

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HEAVY DUTY CONCRETE FLOOR HARDNERS ..... **4 - 5**

All areas subject to heavy traffic—industrial, railroads, docks, machine shops, garages, foundries, steel mills, warehouses, metal stamping, textile, paper, etc. METALICRON and METALLIC HARDNER recommended.

AVERAGE DUTY CONCRETE FLOOR HARDNERS ..... **6 - 7**

Light industrial areas, office buildings, loft, hospitals, hotels, laundries, theatres, auditoriums and similar areas subject to heavy foot traffic, light manufacturing, light trucking, etc. MASTER MIX and SANISEAL recommended.

COLORED CONCRETE FLOOR HARDNERS ..... **9, 10, 11 - 12**

For offices, schools, hospitals, churches, loft buildings, clubs, theatres, store rooms, apartments, residences, power plants, etc. Three techniques available: COLORMIX Colors and hardens topping throughout. COLORED METALICRON—dust coat method. DYCROME—stains and hardens after floors are installed.

PROTECTIVE AND DECORATIVE TREATMENT FOR MASONRY ..... **13 - 14**

BRIKRON for minimizing efflorescence, waterproofing mortar joint and protecting joint from disintegration; MASTERTEX for decorating and protecting masonry; MASTERSEAL Colorless Waterproofing for waterproofing and protecting concrete and stone from cracking and spalling.

WATERPROOFINGS ..... **15 - 16**

Complete data and specifications on Master Builders Waterproofings—Integral Liquid, Paste, and Powder; Metallic (iron); Plaster Bond; Foundation Coating.

OMICRON—The exclusive differential in Master Builders products. See page **8**

The "Terminal Group"
Cleveland, Ohio
Graham, Anderson, Probst & White, Architects

New York Central Building, N.Y.C.
Warren & Wetmore, Architects

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ON ALL AREAS SUBJECT TO HEAVY TRAFFIC
MACHINE SHOPS . . . GARAGES . . . FOUNDRIES
STAMPING . . . PRINTING . . . TEXTILE . . . PULP

specify METALICRON

DESCRIPTION: Metalicron is the modern application of the original Master Builders Metallic Hardner principle that has been recognized as a standard since 1910. Metalicron is a combination of Master Builders pure water absorbent Metallic Hardner plus OMICRON—the corrosion-resisting ingredient discovered by Master Builders Research Laboratories and an exclusive feature in Master Builders products.

TYPES OF CONSTRUCTION: Metalicron is distributed over and troweled into the surface of the freshly floated concrete floor by either of the following standard floor-finishing methods:

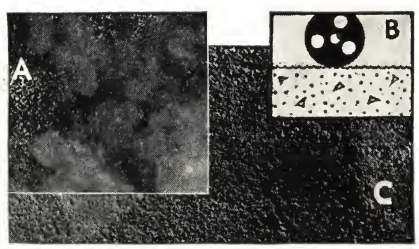
a. Finished Base Slab (often called "Monolithic Finish"): Immediately after leveling and floating the slab, a dry mixture of portland cement and Metalicron is distributed over the floor and floated in, followed by steel troweling.

b. Topping Type Floor: Separate top finish (¾″ to 2″) applied to either fresh or hardened base slab; a mixture of portland cement and Metalicron is distributed over the mortar surface and floated in, followed by steel troweling.

OMICRON: Metalicron is immediately distinguished from all other metallic type hardeners by its Omicron content. Omicron combines with portland cement to reduce the ratio of solubles in set concrete, thereby increasing not only the strength of the concrete but likewise its resistance to the disintegrating action of corrosive acid and alkali agents present to a greater or less degree on all floors.

WELL KNOWN: The Metalicron method is well known to the cement floor finishing trades; is recommended by foremost specialists; and may be specified with full assurance that proper use and successful results will be obtained.

Obtain These Advantages of



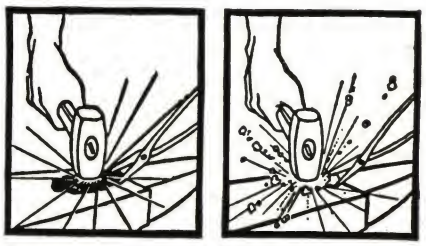
"A"—Photomicrograph of calcium hydroxide crystals, the soluble part of a concrete floor.
"B"—Illustrating how abrasion crushes or knocks loose aggregate exposed by corrosive etching.
"C"—Showing effect of corrosives on concrete floor. Aggregate exposed to abrasive wear.

It Protects From Corrosion

Practically all concrete floors are subject to action of corrosive agents. As portland cement hydrates certain soluble by-products are formed that remain inert in the concrete reducing strength and cementing value. These salts are soluble by corrosives—even in very mild form. Omicron—a discovery of Master Builders Research Laboratories—reacts with and reduces the ratio of these soluble salts, converting them into cementitious factors adding increased strength and full resistance to corrosive action. (For complete data on Omicron and its contribution to the life of concrete, see page 8.)

It Protects From Abrasion

Pound a piece of sand with a hammer—it crushes to powder because it is brittle.
Pound a piece of iron—it dents but does not crush.



In a Metalicron floor subject to heavy traffic the same thing takes place. The ductile metallic aggregate which replaces the brittle sand gives but does not crush as sand does. This explains why Masterbuilt floors far outlive plain finish floors and require little or no repair.

TESTS OF METALICRON

Sea Water Tests—Nova Scotia Technical College, Halifax, N. S.

Mix—1 Portland Cement: 2 parts Ottawa Sand, for plain samples. 1 Portland Cement: 1 Ottawa Sand: 1 Metalicron, for Metalicron samples. Water cement ratio 1.13. Specimens submerged in Halifax harbor salt water.

Set No.		Days in Moist Air	Time in Salt Water	Tensile Stgth.	Com. Stgth.
1.	With Metalicron	7	none	428	3420
3.	Without Metalicron	7	none	321	2355
	Metalicron stronger than plain by			33%	45%
5.	With Metalicron	28	3 mo.	791	5910
6.	Without Metalicron	28	3 mo.	482	3770
	Metalicron stronger than plain by			64%	56%
7.	With Metalicron	28	2 mo.	723	5800
8.	Without Metalicron	28	2 mo.	499	3400
	Metalicron stronger than plain by			45%	70%

Pittsburgh Testing Lab. No. 65412

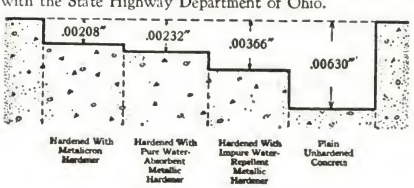
4″ x 2″ compression cylinders of 1:3 concrete, plain and treated with Metalicron were stored in water and in a corrosive solution of 10% sodium sulphate for periods given. Note comparative resistances to disintegrating action.

Pounds Per Sq. Inch in Compressive Strength

Age Days	Stored in	Untreated	Metalicron	Increase
28	(Water	3750	4280	14 %
	(10% Sod. Sul.	3500	4233	20.9%
	% loss from chemical attack	7%	1%	
60	(Water	3653	4653	27.3%
	(10% Sod. Sul.	2827	4563	61 %
	% loss from chemical attack	22%	2%	
90	(Water	3233	4857	50.2%
	(10% Sod. Sul.	2437	4683	92%
	% loss from chemical attack	24%	4%	

Abrasive Tests

The graph below shows the relative depth of wear produced by abrasion on concrete slabs of different finishes and is based on tests made by A. B. Braden, Consulting Engineer with the State Highway Department of Ohio.



CONCRETE FLOORS

INDUSTRIAL . . . RAILROADS . . . DOCKS . . .
. . . STEEL MILLS . . . WAREHOUSES . . . METAL
PAPER AND ALL HEAVY MANUFACTURING.

for Double Protection

NON-SLIP METALICRON

This is standard Metalicron combined with special slip-proof aggregate, and designed for use on ramps, corridors, stairs, wet areas, etc., where non-slip finish is desired. Specifications as below, except say "Non-slip Metalicron."

METALLIC HARDNER

Master Builders Metallic Hardner is the original metallic hardner perfected by Master Builders Research Laboratories in 1910. Provides a durable wear resisting surface second only to Metalicron. Specification is the same except say "Metallic Hardner" rather than "Metalicron."

PACKED: Metalicron, Non-slip Metalicron and Metallic Hardner are packed in 100-lb. waterproof canvas bags sealed with Master Builders guarantee seal.

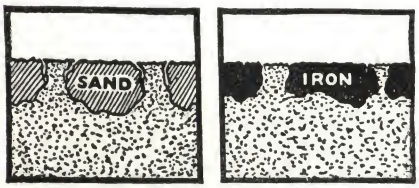
SPECIFICATION

All concrete floors in (here indicate specific area) shall be hardened with Master Builders Metalicron, using not less than (here insert "30 lbs." for heavy duty, "40 lbs." for extra heavy duty, or "50 lbs." for extremely heavy duty floors) for each 100 square feet of floor. These floors shall be finished according to the manufacturer's directions for (here insert "finished base slab" or "topping type") Metalicron floors.

Metalicron Protected Floors

Waterproofs and Greaseproofs a Floor

Besides being wearproof, Metalicron floors are positively waterproof. When troweled in to the floor the metallic particles oxidize slightly,



making the wearing finish impervious to water, oil or grease. Note the sketch above. Minute pores tend to separate the cement and inert sand aggregate. Where metallic aggregate is used, the oxidizing action expands sufficiently to fill these pores, further cementing the aggregate into the finish and creating a homogeneous, non-porous surface of great density.

Merchandise Mart, Chicago. World's largest building, 1,000,000 sq. ft. of Metalicron Floors, 4,000,000 sq. ft. of Master Mix Floors. Graham, Anderson, Probst and White, Architects.

Matches Standard Set By P. C. A.

The standard established by the Master Builders Research Laboratories for Metallic Hardner twenty-two years ago is confirmed by the Portland Cement Association in its book "Concrete Floor Finishes" which makes the following recommendations: "Metallic aggregates have been used successfully in the wearing surface of concrete floors. In selecting this material particular attention should be directed to proper grading, freedom from oil, grease, non-ferrous metals and other harmful impurities. *It should not be water-repellent.*"

Master Builders Metalicron and Metallic Hardner have always completely met the standards now recognized by the Association.

Water absorbency test. Master Builders Metalicron and Metallic Hardner are water absorbent as recommended by the Portland Cement Association.

WHAT INDUSTRIAL LEADERS SAY

E. I. DuPont de Nemours & Co.—" . . . all installations of Master Builders Metalicron have proven very satisfactory.

General Electric Co. (Canada) ". . . you may be sure that if the results are as good as we have had in the States, it will be a pleasure to specify your floors."

Pure Oil Co. (Refinery) " . . . Your letter regarding the Metalicron floor—this floor gets rather hard service and so far as I have been able to observe personally, and from reports submitted to me . . . no signs of pitting are observable."

Merchandise Mart, Chicago—" . . . after a careful investigation by our architects your floors were recommended to us and independent research on our part revealed that they were proving successful in other buildings. One of two tenants who have large stockroom areas took extra precautions to allay any latent dust common to cement floors but this varnish-like coating was applied only in very small portions and due to the density of your floors is now peeling off. We . . . feel very well repaid for the extra cost incurred through the adoption of your hardeners."

New England Dressed Meats Co. (Packing House) Somerville, Mass. "The Metalicron hardener which we used . . . gives us a very satisfactory floor."

Westinghouse Electric & Mfg. Co.—" . . . the floor is retaining its smooth, slatelike surface . . . should we install additional flooring in our plant, we would undoubtedly consider very seriously the use of Metalicron."

Viscose Co. (Cellulose) Parkersburg, W. Va.—" . . . regarding the service of our floors in which Master Builders Metalicron Hardener was used. We are pleased to report that these floors are very satisfactory."

Kay Brunner Steel Products, Inc.—" . . . in regard to the concrete floors installed in our Alhambra Foundry wherein Master Builders Metalicron Hardened Concrete was used. Wish to advise that your material has increased the hardness and life of our floors and at this writing we are pleased to advise that the floors are standing up very well under the very hard use which a foundry floor is given."

FOR AVERAGE-DUTY

ON LIGHT INDUSTRIAL AREAS . . . OFFICE BUILDINGS . . . LOFT BUILDINGS AUDITORIUMS AND SIMILAR AREAS . . . SUBJECT TO HEAVY

specify MASTERMIX *the*

DESCRIPTION — Master Mix, integral liquid hardner which hardens, waterproofs and dustproofs concrete floor finish throughout its entire thickness, has been a standard for moderate-to-heavy duty service for over Fifteen Years.

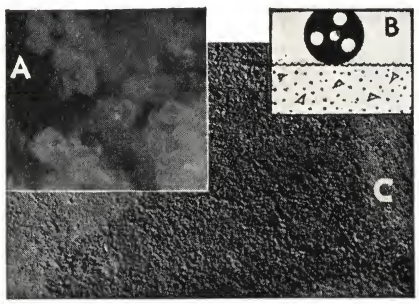
OMICRON—Master Mix is distinguished from all other integral liquid floor hardeners by its basic hardening ingredient, Omicron. Discovery of Master Builders Research Laboratories, Omicron is an exclusive advantage obtained only in Master Builders products. In Master Mix it acts not only as a hardner and wearproofer but performs important additional functions of major value in floor construction. These functions are pictorially described below. Specifically, Omicron combines with portland cement to reduce the ratio of solubles in set concrete, thereby increasing not only the strength of the concrete but likewise its resistance to the disintegrating action of corrosive acid and alkali agents present to a greater or less degree on all floors. For complete data on OMICRON see page 8.

EASY TO USE. Throw a quart into the mixer for each bag of cement in the batch.

APPROXIMATE COST. Approximate cost per inch of finish . . . one cent per sq. ft.

➤ SPECIFICATION—*Light Commercial Traffic*
All concrete floor finish as designated shall consist of one part standard Portland Cement and two parts clean, graded, sharp sand, and shall be hardened with Master Builders Master Mix used in the proportions of one quart of Master Mix for every bag of cement mixed. The Master Mix shall be added to the gauging water, or shall be thrown directly

Obtain these Advantages



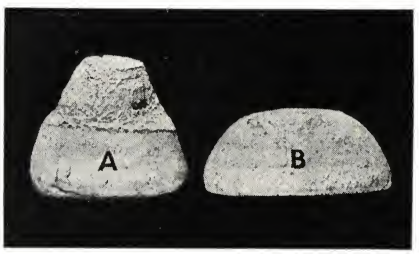
"A" Photomicrograph of calcium hydroxide crystals. "B" Showing how corrosive etching exposes brittle aggregate to abrasion. "C" Floor etched by mild corrosives.

It Protects From Corrosion

Authorities state that from 7 to 17 lbs. soluble calcium hydroxide (free lime) are formed in the hydration of each hundred pounds of portland cement. This calcium hydroxide is the most soluble part of concrete and will dissolve out when in contact with corrosives—even those in very mild form. Corrosive agents—present in smoke and fume deposits, strong cleaning powders, etc., attack those soluble salts pitting and etching the surface and leaving the sand exposed to abrasive wear. The Omicron base of Master Mix guards a floor against this corrosive etching by making the most soluble part of the floor as insoluble as the rest of the concrete mass. Note corrosive tests in lower left corner. (For complete data on OMICRON see page 8.)

It Permits Low Water/Cement Ratio

Low water/cement ratios of 4 or 5 gallons of water per bag of cement produce stronger, denser floor finish than where 7 or 8 gallon ratios are used. However, low water ratios make harsh, unworkable finishes—are often considered impractical by the contractor as they slow up the job and increase costs. This results in the use of much sloppy mortar, leading to segregation of aggregate and weak, dusty floors.
Master Mix—due to the high lubricating action of Omicron—meets this situation squarely, actually discouraging the use of excess water by producing an ideal mortar with low water ratio.



Slump test above shows how Master Mix increases workability. Both slumps have the same water/cement ratio of 4¾ gallons of liquid per bag of cement. Both contain the same sand and cement mix. Slump "A" (with a 4-inch slump) contains no admixture. Slump "B" (with 8-inch slump) contains 4¼ gallons of water and ½ gallon of Master Mix. This increased workability contributed by Master Mix makes low water/cement ratio mixes easy to place and finish—automatically makes sure that low water/cement ratios will be used

TESTS OF MASTERMIX

CORROSION TESTS

Pittsburgh Testing Lab. No. 65412

Compression Strength Pounds per Square Inch 1:3 Concrete	28 Days in Water	21 Days in 10% Sol. Sodium Sulphate	60 Days in 10% Sol. Sodium Sulphate
Untreated	3750	3500	2827
With Master Mix	3963	4066	3860

STRENGTH TESTS

Pittsburgh Testing Lab. No. 62951

Compression Strength Pounds per Square Inch Age	Untreated	Master Mix	Per Cent Increase
7 days	3683	4220	14.6%
28 days	6047	6810	12.6%

Tensile Strength Pounds per Sq. In. Age	Untreated	Master Mix	Per Cent Increase
7 days	490	568	15.9%
28 days	603	692	14.7%
90 days	655	722	10.2%
365 days	688	815	18.4%

ABRASIVE TESTS

Columbus Testing Laboratories, Columbus, Ohio

Relative depth of wear on concrete slabs treated and untreated, cured 28 days, measured after six hours of constant abrasion:

Master Mix ..... .00452"
Untreated 1:2 ..... .00748"

CONCRETE FLOORS

...HOSPITALS...HOTELS...LAUNDRIES...THEATRES...
FOOT TRAFFIC...LIGHT MANUFACTURING...LIGHT TRUCKING...ETC.

integral Omicron hardner

into the mixer. The finish mortar shall be placed, finished and protected in accordance with directions of The Master Builders Company, Cleveland.

SPECIFICATION—*Heavy Commercial Traffic*

All concrete floor finish as designated shall consist of one part standard Portland Cement, one part clean, graded, gritty sand and two parts clean, hard pea gravel or crushed stone graded in size up to one-quarter inch. Floors shall be hardened with Master Builders Master Mix, used in the proportion of one quart of Master Mix per sack of cement. The Master Mix shall be added to the gauging water, or shall be thrown directly into the mixer. The finish mortar shall be placed, finished and protected in accordance with directions of The Master Builders Co., Cleveland.

FOR FLOORS ALREADY INSTALLED *specify* SANISEAL

Master Builders Saniseal is a powerful chemical hardner which, when mixed with water and brushed into the floor surface, deposits a hard, wear-resisting crystal in each pore of the floor. This arrests dusting and hardens the surface.

Saniseal is designed as a maintenance or corrective treatment for floors already installed. Because such hardners are effective only at the surface, it is not as efficient or economical as Mastermix, which hardens through full finish and which is therefore to be preferred when specifying for new floors.

SPECIFICATION—All cement finish floors shall be hardened and dust-proofed by an application of Master Builders Saniseal, using not less than two pounds of Saniseal per 100 sq. ft. and applied according to the directions of the manufacturer, The Master Builders Co., Cleveland.

# of MASTERMIX

Adds Permanent Strength

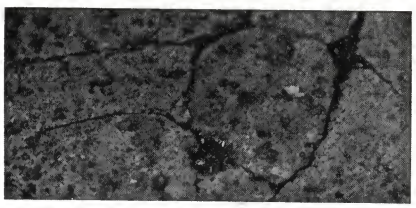
Master Mix adds from 10 to 18 per cent additional strength to floor finish over and above that added by the low water/cement ratio. This strength is permanent. The claim is sometimes made that integral hardeners merely accelerate the set and give quick strength but no additional *permanent* strength. Although this contention is probably true in the case of hardeners having chemical accelerators as the basic hardening ingredient—it is not apropos in the case of Master Mix as its basic hardening ingredient is Omicron which adds permanent strength by forming additional cement-like products in the concrete. Note tests in lower left corner.

Partial List of Installations

Merchandise Mart, Chicago.
C. B. Ragland Company Warehouse, Nashville, Tenn.
Advance-Rumley Bldg., Dallas, Texas.
Fountain City Dairy Co., Fond du Lac, Wis.
Kohler Co., Kohler, Wis.
County Safety Bldg., Milwaukee, Wis.
Carnation Milk Prod. Co., Oconomowoc, Wis.
New York Central Bldg., New York City
New York Tribune Bldg., New York City
Pershing Square Bldg., New York City
Saks Fifth Ave. Store, New York City
Cleveland Union Terminal Bldg., Cleveland, Ohio
American Insurance Union Bldg., Columbus, Ohio
Fox Theatre Bldg., Philadelphia, Pa.
Gimbel Bros. Co., Philadelphia, Pa.
Fisk Tire Bldg., Los Angeles, Cal.
Atlanta-Biltmore Hotel, Atlanta, Ga.
Field Museum, Chicago, Ill.
Parke Davis Co., Detroit, Mich.
Union Station, Chicago, Ill.
Illinois Merchants Bank Bldg., Chicago, Ill.
Harvard School of Business, Cambridge, Mass.
Paige-Detroit Motor Co., Detroit, Mich.
Kalamazoo Paper Mills, Kalamazoo, Mich.
Firestone Tire Co., St. Louis, Mo.
Dold Packing Co., Successors to Skinner Packing Co., Omaha, Neb.
Pittsburgh Plate Glass Co., Newark, N. J.

Waterproofs—Protects From Crazing

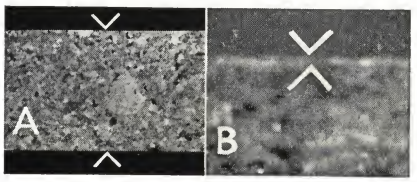
Alternate wetting and drying, freezing and thawing, and calcium hydroxide crystal pressure are principal causes of crazing and cracking of concrete floors exposed to the elements. (See picture below.) To protect floor finish from this action it is necessary to make it impervious to water infiltration and reduce crystal formation.



Master Mix effectively densifies and waterproofs cement finish and reduces possibility of crystal pressure due to the action of Omicron. Consequently Master Mix protects floor finish from cracking due to these causes.
The waterproofing quality of Master Mix is also of advantage for basement floors, for floors in direct contact with the ground and for preventing lingering dampness after scrubbing.

Presbyterian Hospital Group
New York City
James Gamble Rogers,
Architect

It Hardens Throughout Topping



Strength is built *into* a Master Mix Floor. It is hardened throughout the entire wearing finish. Such a floor retains its slatelike surface, keeps its smooth, new appearance for years. This is in marked contrast to surface hardening treatments which merely crystalize the surface to a depth of approximately 1–48th of an inch.

"A" Hardened throughout by Master Mix. Note the dense, non-segregated appearance of this cross section of topping.

"B" Hardened by a surface dustproofer 1–48-in deep. When top skin wears off, hardening effect disappears.

Protects Linoleum

Due to the action of its basic ingredient—Omicron, Master Mix nullifies the action of lime salts on the adhesive used for bonding soft coverings to a concrete floor and thus provides a firm bond between the two.

Where the soft covering is properly laid, loose bond—with attendant waves and wrinkles—will not develop on a Master Mix floor.

Advantages of OMICRON

PERMITS LOW W/C RATIO

Slump tests. Slump "B" (containing the Omicron admixture, Master Mix) is 4 in. greater than slump "A". Water/cement ratio same. Same mixes.

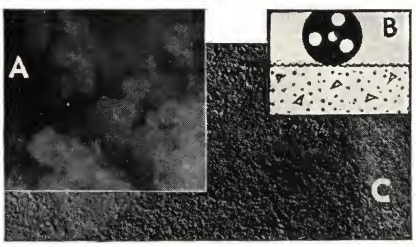
PERMANENTLY INCREASES STRENGTH

Robert W. Hunt Testing Laboratory, Pittsburgh.

Compressive Strength in lbs. per sq. in.

Age	Untreated	Plus Omicron	Per Cent Increase
1 day	188	565	200%
3 days	1557	1823	17%
7 "	2295	2775	20.9%
28 "	2909	3587	23.3%

ARRESTS CORROSIVE ETCHING



"A"—Photomicrograph of calcium hydroxide crystals—the vulnerable part of concrete. Mild acids and alkalis can readily dissolve such salts out of the floor and open it up to abrasive wear.

"B"—Illustrating how corrosive etching accelerates abrasive wear by exposing the brittle aggregate to be crushed or knocked loose.

"C"—Concrete floor etched by cleaning solutions, smoke and fume deposits.

Pittsburgh Testing Laboratory. Compressive Specimens in 10% Sodium Sulphate.

	Untreated	Plus Omicron	Greater Strength with Omicron
28 days in water	3750	4487	19.6%
21 days in sod. sul.	3500	4400	25.7%
Loss from corrosion	8.8%	1.3%	

PROTECTS COLORS

"A"—How black interspersed with white turns gray. "B"—A black unadulterated by white. Same thing takes place when soluble salts come to surface of colored concrete—Omicron arrests this action after floors are in use.

OMICRON

. . *The Exclusive Differential in* MASTER BUILDERS PRODUCTS *Serves Five Useful Functions in Cement Mixes!*

OMICRON discovered in Master Builders Research Laboratories — is the exclusive basic ingredient that distinguishes Master Builders Hardners and waterproofing from all others.

Omicron combines with portland cement to reduce the ratio of solubles in set concrete, thereby adding strength, permanence and corrosion resistance to concrete.

» LOW WATER/CEMENT RATIOS PRACTICAL WITH OMICRON

Low water/cement ratios of from 4½ to 5 gallons of water to a bag of cement are recommended by the Portland Cement Association for strength. Such ratios produce harsh, unworkable mixes which tend to slow up placing and finishing operations. To meet this condition, contractors tend to increase the amount of water used. While floors laid with concrete mixed 7 or 8 gallons of water to the bag of cement may look good at first, the strength is not there and failure results.

By specifying an Omicron-containing hardner you can make sure that a low water/cement ratio will be used. For Omicron provides the necessary plasticity for finishing without the addition of excess water. Omicron lubricates the entire mix, making it easy to place and finish.

» OMICRON PERMANENTLY INCREASES STRENGTH

The test at left is selected from many which confirm the fact that Omicron permanently increases the strength of concrete. Complete test reports will be furnished upon request.

» OMICRON CHECKS CORROSIVE ETCHING

From 7 to 17% of Calcium hydroxide is thrown off by portland cement during hydration. This salt is readily soluble. Dissolution is rapid in 10% acid or alkali solutions, slower in solutions of less strength. It has been identified by authorities as the most vulnerable (to corrosion) part of concrete.

Corrosive agents are present on all areas: actively in industrial plants in the form of grease, oils, fats, acids and alkalis; mildly in other areas in the form of smoke and fume deposits, alkalis in soaps and cleansing powders. Corrosive agents attack the waste solubles in cement, etching them away and intensifying the destructive action of abrasion.

By largely eliminating the presence of waste solubles in concrete and replacing them with corrosive-resistant compounds, Omicron checks corrosive etching and disintegration, adding substantially to the life expectancy of the floor. See test at left.

» OMICRON INCREASES DENSITY AND WATER TIGHTNESS

The practical use of a low water-cement ratio permitted with Omicron decreases porosity by decreasing the amount of water to be evaporated. The high plasticity assured with Omicron permits more thorough troweling and the added Omicron-cement-like products increase density. These factors combine to give a dense, slate-like finish that is watertight.

» OMICRON PROTECTS COLORS

The staining and clouding of colors in concrete floors after they have been in use for a time is caused by the deposit of lime salts on the floor surface by efflorescent action. By largely eliminating the presence of soluble salts, Omicron definitely checks color clouding at its source, and keeps the floor color bright and free of these blemishes

» RECOGNITION OF OMICRON'S VALUE

The Omicron principle has been fully proved in laboratory and field tests. Well over 43,000,000 square feet of floors are now receiving the double protection that Omicron alone can give. In Omicron, Master Builders offers another major result of the comprehensive research and product-development service that it has rendered to the building industry since 1910.

Save
ON THESE AREAS

General area in office building. This year a lawyer's office. Next year the quarters for a sales organization, photographer's studio, advertising agency, etc. A Colored Masterbuilt Floor appropriate for all. Floors made ready for new tenants at minimum cost to building owner or lessee.

Store basement space is valuable sales space. A Colored Masterbuilt Floor provides the proper background, durability waterproofness needed on such areas. Maximum beauty at minimum cost.

Loft space. Colored Masterbuilt Floors save cost of painting and repainting such areas and increase rentability and salability of the building.

COLORED MASTERBUILT FLOORS
Increase a Building's Income

THE cancer of annual floor painting costs has for years eaten into the income from buildings and has been looked on as an incurable disease. Most owners and renting agents, because of their lack of information for combatting the disease, have ceased to concern themselves with it and have not even troubled to segregate the costs of painting floors, feeling "what's the use." These costs have been bulked with wall and ceiling painting and general decorative costs.

» TYPICAL EXAMPLE

An extensive survey made for The Master Builders Company discloses what a serious drain on income is represented in the cost of painting concrete floors. One nationally-known office building of the highest class incurs a cost of $8,750.00 annually for painting floors in rented areas—an average of one cent per square foot annual expense for the entire rentable area of the building.

This annual penalty of $8,750.00 could have been saved many times over if the facts—now available—had been placed in the builders' hands before the floor specifications were written.

» SAVE UP TO 55c PER SQUARE FOOT BY BUILDING COLOR AND HARDNER INTO FLOORS

Plain cement finish floors are a permanent expense. They must be painted annually (or oftener if appearance values are of a major importance) at an average cost of three cents per square foot—or sixty cents a square foot over a twenty-year period.

By building color into concrete floors when laid, this expense can be eliminated. Even where various areas are covered, the economy effected is of major importance.

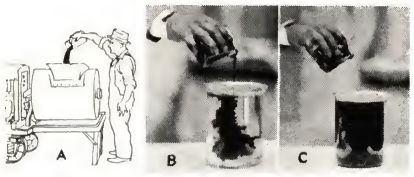
» NEW ECONOMY AND BEAUTY FOR CONCRETE FLOORS IN ALL TYPES OF BUILDINGS

The Master Builders Company has perfected methods and materials that make these savings available in all types of buildings. They produce new floor beauty and eliminate the year after year cost of painting. Before completing your plans, *get the details as they apply to your project.* We will be glad to submit conclusive cost data for the building you are now planning, giving you in advance a clear picture of the savings possible.

Store space. This year an automobile agency. Next year a five and ten or a drug store. Durable Colored Masterbuilt Floors suitable for any type of occupant. Escapes the inconvenience and expense of frequent repainting.

Even on areas that are not rented, Colored Masterbuilt Floors economize. By specifying built-in color, annual painting of service areas is eliminated.

Advantages of LIQUID COLORMIX

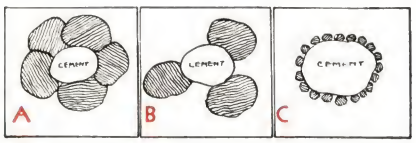


A—EASY TO USE

No weighing or dissolving necessary. Merely throw a gallon in the mixer for each bag of cement. Guesswork eliminated. Uniform mix assured.

B, C—INSTANTANEOUS DISPERSION

Because of its liquid form and the colloidal nature of its constituents, Colormix is dispersed instantly throughout the mix. Note illustration—there is no settling at bottom.



PULVERIZED COLORS—COMPLETE COVERAGE

"A"—cement particle completely coated with commercial size color oxide. If this amount of color is used, floor is greatly weakened. "B"—amount of commercial size color possible to use without injury to floor. Will not produce a deep color, as it does not give complete coverage. "C"—how pulverizing color particles permits complete coating of cement with a minimum of color. Deep color secured. Color Oxides used in Colormix are many times finer than Portland cement.

PROTECTED FROM CLOUDING

White lime salts brought to surface by moisture evaporation fade colors as in "A." The Omicron content of Colormix arrests lime salt formation and protects original color as in "B."

PERMITS LOW WATER-CEMENT RATIO

Because of its unusual lubricating effect Colormix makes possible low water-cement ratio and consequent increased strength. Illustration shows Colormix mortar "A" has 2-inch greater slump than plain mortar "B." Same mix and water-cement ratio in each.

STRONGER THAN PLAIN CEMENT

Tests below show Colormix Floors stronger than plain, uncolored floors. Same water-cement ratio and mix used in all. Increased strength of Colormix due to its Omicron basic hardening ingredient. See page 8 for data on Omicron.

Compressive Strength in Pounds

	3 days	7 days	28 days
Plain	1262	1961	2619
Red Colormix	2290	3212	4422
B. S. Gray Colormix	1622	2004	3530
French Gray Colormix	1305	2258	3562
Black Colormix	1527	2132	3118
Brown Colormix	1558	2386	4040
Blue Colormix	1558	2482	3690
Green Colormix	1654	2800	4134

TO COLOR *and* HARDEN A FLOOR THROUGHOUT TOPPING *specify* COLORMIX

COLORMIX represents the most complete and perfect method yet devised for building colored concrete floors with a deep, lasting beauty—colored, hardened and waterproofed throughout the entire thickness of the topping.

» NEW DEVELOPMENT—LIQUID FORM

The liquid form of Colormix is a sweeping advance in the field of integral colored floor hardeners. Through this most recent improvement Master Builders Research Laboratories have in one compound combined the following exclusive advantages:

Use Simplified—Results Sure. Merely add a gallon of the liquid Colormix to the mix for each bag of cement used. The difficulty and expense of weighing paste of dry hardeners—with attendant likelihood of non-uniform batches—is eliminated.

WHEN RECOMMENDED

Colormix is recommended whenever the maximum in beauty, durability and satisfaction is desired. Only applicable to floors having a topping finish.

For two other techniques of coloring and hardening floors, see Colored Metalicron and Dycrome pages.

Coloring Strength Intensified—Complete Coverage Obtained. Due to a new process, color oxides used in Colormix are pulverized many times finer than portland cement. With this degree of particle fineness, complete coverage of cement particles with a deeper color can be obtained without endangering the strength or wearing quality of the floor. By the same process, colors are made brighter and freed of sulphates and other appearance-destroying minerals found in oxides in raw form. See illustration at left for principle of complete coverage.

Omicron. As in all Master Builders integral hardeners, Omicron hardner is the basic hardening ingredient. In Colormix, Omicron performs the following functions: (1) Hardens the floor, making it more wear-resistant than plain cement finish. (2) Densifies and waterproofs the floor. (3) Protects floor from clouding due to soluble salts being brought to the surface by moisture evaporation. (4) Permits the use of a low water-cement ratio by providing greatly increased workability. For complete details see page 8 on Omicron.

SPECIFICATION

All concrete floor topping as indicated shall be colored and hardened with Master Builders Colormix, using one gallon for each bag of cement in the mix, and following the manufacturer's detailed directions. Just before the floor is turned over for use, it shall be given a treatment with (here insert "Colorwax" or "Coloroil").

Colors Available. Tile Red, Persian Red, Maroon, Russet Brown, Seal Brown, Battleship Gray, French Gray, Terra Cotta, Green, Blue and Black.

Quantities Required. One gallon of Colormix, regardless of color, is required for each bag of cement in the mix. Estimate 4 gallons of Colormix for each 100 square feet of one-inch topping. Packed in 60, 40, 20, 8 and 4-gallon steel containers. Complete directions for use are attached.

Stainproof Protective Paper. With each order of Colormix, sufficient Stainproof Paper is supplied to cover and protect the floor until ready for use.

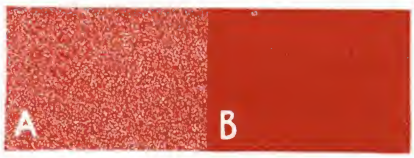
Colorwax or Coloroil Finish. Colormix Floors, finished with either Colorwax or Coloroil, develop a deeper color, with a glossy, protective finish that gives a linoleum-like feel under foot. Use Colorwax for interiors. Use Coloroil for exteriors subject to the elements.

SUGGESTED PATTERNS

Advantages of COLORED METALICRON

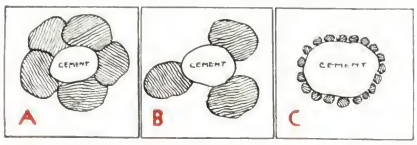
EASY TO USE

Colored Metalicron is scattered over a freshly floated floor, floated in and given two steel trowellings. Method well known to finishers.



PROTECTED FROM CLOUDING

White lime salts brought to surface by evaporation fade colors as in "A." The Omicron content of Colored Metalicron arrests lime salt formation and protects original color.



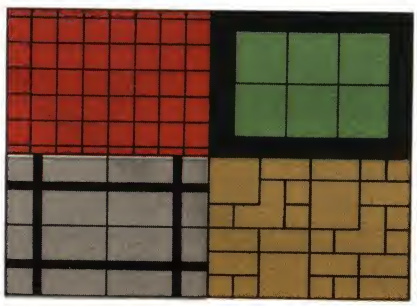
PULVERIZED COLOR—COMPLETE COVERAGE

"A"—cement particle completely coated with commercial size color oxide. If this amount of color is used, floor is greatly weakened. "B"—amount of commercial size color possible to use without injury to floor. Will not produce a deep color, as it does not give complete coverage. "C"—how pulverizing color particles permits coating of cement with a minimum of color. Deep color secured. Color Oxides used in Colored Metalicron are many times finer than Portland Cement.

HARDER THAN PLAIN FINISH

Colored Metalicron Floors are harder than plain cement finish, despite the fact that color is used. This is due in part to the great density and added compressive strength which the Omicron ingredient imparts and in part to the hard, specially-graded aggregate content of Colored Metalicron.

EFFECTS POSSIBLE



TO COLOR *and* HARDEN A FLOOR BY DUST-COAT METHOD *specify*

COLORED METALICRON

COLORED METALICRON is a compound of superfine oxide colors, Omicron hardener and tough, wear-resisting aggregate. When mixed with Portland cement and trowelled into a freshly-floated concrete floor, it produces an attractively-colored wearing surface, slatelike in smoothness, wearproofed and waterproofed.

Tested and proved by years of use, this method of coloring concrete floors possesses these three most modern advantages:

WHEN RECOMMENDED

Colored Metalicron is recommended for areas where low cost is a major requisite. Also in cases where topping is omitted, the base slab being finished off as a wearing surface.

For two other techniques of coloring and hardening concrete floors, see Colormix and Dycrome pages.

» OMICRON

As in all Master Builders integral hardeners, Omicron hardener is the basic hardening ingredient (see page 8 for complete details, tests, etc.) In Colored Metalicron, Omicron performs the following functions: 1) Hardens the floor finish so that it tests more wear resistant than plain cement finish. 2) Densifies and waterproofs the floor. 3) Makes floor resistant to corrosive etching of mild acid and alkali deposits from smoke, fumes and strong, cleaning powders. 4) Protects the floor from clouding due to soluble salts being brought to the surface by moisture evaporation. 5) So increases workability of mortar that hardener is easy to trowel in even when a low water-cement ratio is used.

» PULVERIZED OXIDES—COMPLETE COVERAGE

To secure a satisfactory, bright color in a floor, cement particles must be completely coated with color. Commercial oxides are about the same size as portland cement—too large to permit complete coverage of cement particles without the use of excessive amounts which, in turn, will weaken the wearing quality of the floor.

Through a special pulverizing process, the color oxides in Colored Metalicron are rendered many times finer than portland cement—complete coverage is obtained with a minimum of color oxide. By the same process, colors are made brighter and freed of sulphates and other minerals detrimental to lasting colors. See illustration at left for data on the principle of complete coverage.

» WEAR-RESISTING AGGREGATE

In Colored Metalicron, there is incorporated carefully-graded, tough, wear-resisting aggregate particles that add greatly to the abrasive resistiveness of the finished floor. See tests below by Herron Laboratories.

SPECIFICATION

All cement floors in (here indicate specific areas), shall be colored and hardened with Master Builders Colored Metalicron, following the directions of the manufacturer and using not less than 30 lbs. of Colored Metalicron per 100 square feet of floor.

Colors Available—Tile Red, Persian Red, Russet and Seal Brown, Terra Cotta, French and Battleship Grey, Black, Blue, Green. In 100-lb. Canvas Bags.

NON-SLIP COLORED METALICRON

This is Colored Metalicron combined with special slip-proof aggregate, and designed for use on ramps, corridors, stairs, wet areas, etc., where non-slip finish is desired. Specification same, except say "non-slip Colored Metalicron."

ABRASION TEST BY JAMES H. HERRON COMPANY

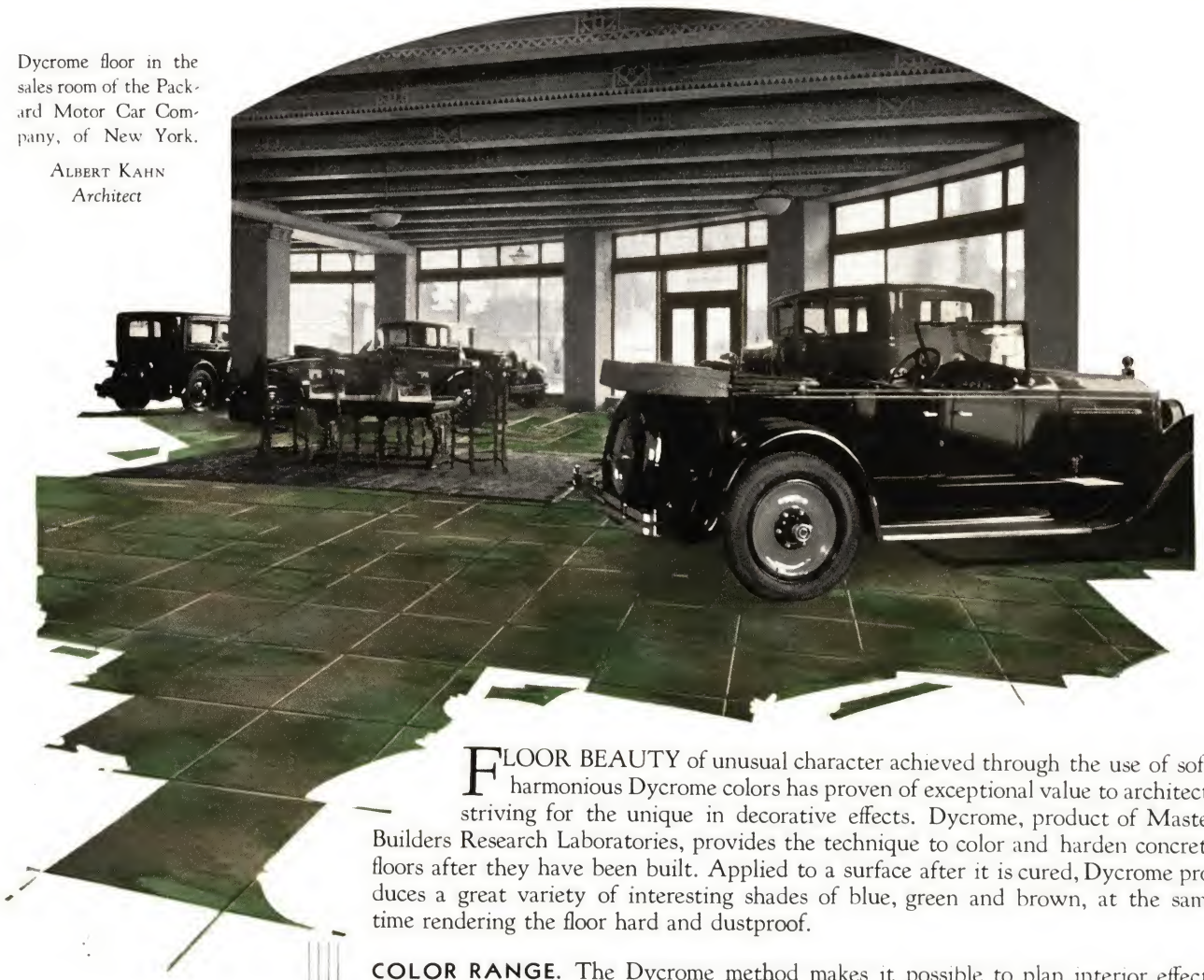
Testing Engineers and Chemists *Cleveland, Ohio*

Relative Depth of Wear Produced by Abrasion—Plain and Colored Mortars

Plain	.00138″	Colored Metalicron—	
Miscellaneous Pigments—Red	.00307″	Red	.00040″
Brown	.00243″	Seal Brown	.00074″
Green	.00235″	Battleship Gray	.00071″
Blue	.00266″	Black	.00034″
Black	.00283″		

DYCROME

by chemical reaction with cement HARDENS *and* COLORS *with a variety of lasting, interesting tints*



Dycrome floor in the sales room of the Packard Motor Car Company, of New York.

ALBERT KAHN
Architect

FLOOR BEAUTY of unusual character achieved through the use of soft, harmonious Dycrome colors has proven of exceptional value to architects striving for the unique in decorative effects. Dycrome, product of Master Builders Research Laboratories, provides the technique to color and harden concrete floors after they have been built. Applied to a surface after it is cured, Dycrome produces a great variety of interesting shades of blue, green and brown, at the same time rendering the floor hard and dustproof.

COLOR RANGE. The Dycrome method makes it possible to plan interior effects after the floors are in and the decorative scheme determined. Colors include Flemish Oak, Weathered Bronze, Cordovan Brown, Palmetto Green, Nile Green and Jade.

Many attractive combinations of these colors are possible. The blending of green and brown into cloudlike variations suggests the harmony of an autumn hillside. Floors scored in tile-like squares or to modernistic design may have adjoining areas treated separately to effect novel geometric patterns. The final oil or wax finish applied when the desired color is developed, provides a smooth, hard, wear-resisting, easily-cleaned surface.

Dycrome is applied by The Master Builders Service, Inc., an organization expert in this type of treatment.

» SPECIFICATION. All cement finish floors in (here indicate specific areas), shall be colored and hardened with the Master Builders' Dycrome Method as applied by the Master Builders Service, Inc., or their authorized representatives. Cement mortar for such floors shall consist of a mix of one part cement to two parts sand to which shall be added two pounds of hydrated lime for each bag of cement in the mix. Floors shall be turned over to the Master Builders Service, Inc., properly cured and in a clean and stainfree condition.

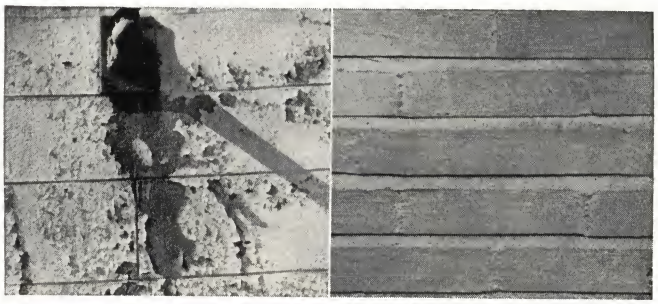
Advantages of DYCROME

» Applied after floor is built. » Produces variety of colors obtainable by no other method. » Hardens as well as colors. » Colors may be combined into a duo-tone effect.

PARTIAL LIST OF INSTALLATIONS

Convention Hall, Atlantic City, N. J.
Severance Music Hall, Cleveland, Ohio.
General Motors Sales Rooms, Los Angeles, Cal.
Lincoln Motors Co., San Diego, Cal.
Mack Motor Co., Albany, N. Y.
Walker & Weeks (Architects) Office, Cleveland, Ohio.
Oakwood Club, Cleveland, Ohio.
Y.M.C.A.—Middletown, Conn.: St. Petersburg, Fla.; Evanston, Ill.; Portland, Me.; Norwalk, Conn.
Dormitory, Bethany College, Bethany, W. Va.
First Baptist Church, Cleveland, Ohio.
Chagrin Valley Hunt Club, Chagrin Valley, O.
Dartmouth College, Hanover, N. H.
La Fonda Hotel, Santa Fe, New Mexico.
Tudor City, New York City.

PROTECTION—DECORATION OF MASONRY



Mastertex contains no volatile elements such as glue, casein, oil or other ingredients that deteriorate when subjected to sun and rain and cause paints to peel and flake off. Left—example of peeling. Right—Mastertex after years of wear on Mothers' and Babies' Hospital, St. Louis.

Stone structures such as these should be waterproofed and protected from corrosive attacks of smoke and fume deposits by Masterseal. Also protects from cracking and spalling due to alternate wetting and drying out, freezing and thawing.

MASTERTEX

Waterproof Cement Paint in Colors

MASTERTEX is a specially designed coating for waterproofing and decorating portland cement stucco, brick, stone, and other masonry. As it contains no volatile elements, such as glue, casein, oil, etc., Mastertex will not blister, flake, or peel off once properly applied. Unlike oil paints, Mastertex is applied to wet surfaces. Colors are light green, blue, brick red, ivory, cream, pink, brown, light gray, French gray, dark gray and white. Covering capacity—ten pounds in 3½ to 4 quarts of water will cover 250 to 300 sq. ft. one coat or from 150 to 200 sq. ft. two coats. May be sprayed or brushed on.

MERITS AND ADVANTAGES: Mastertex has the following advantages: (1) Decorates and waterproofs a surface. (2) Protects surface from cracking and spalling due to alternate wetting and drying out. (3) Contains Omicron which, through its action on the soluble salts, protects the coating from attacks by acids and alkalis from the atmosphere. (4) May be used in place of the last stucco coat. (5) May be used on either exterior or interior surfaces in place of plaster. (6) It will not rub or brush off when applied according to specifications. (7) Original colors are protected from lime salt action by Omicron. (8) May be applied to damp concrete walls as soon as the forms are down. (9) Is applied to wet surfaces and consequently is an excellent material for dampproofing basement walls.

WHERE USED: Waterproofs, decorates and protects brick, stucco and stone buildings and any exposed masonry such as concrete swimming pools, bridges, abutments, retaining walls, etc. Excellent for dampproofing basement walls and as an industrial "inside white" where walls and ceilings are subjected to moisture and fumes containing mild acids and alkalis.

SPECIFICATION: All surfaces of (here indicate areas) shall be waterproofed and decorated with Mastertex applied in accordance with the detailed directions of the manufacturers, The Master Builders Company, Cleveland.

MASTERSEAL

Transparent Surface Waterproofing

MASTERSEAL is a transparent liquid for waterproofing the exposed surfaces of brick, stone, stucco and concrete. It is applied like paint with either brush or spray gun and fills the surface pores with a time defying water repellent substance. Masterseal is made in two grades: No. 1 and No. 2. Masterseal No. 1 slightly darkens light colored surfaces, but is a permanent treatment. Masterseal No. 2 will not change the appearance of the lightest colored surface but may require retreating when climatic conditions are severe.

MERITS AND ADVANTAGES: Masterseal has the following advantages: (1) Prevents moisture absorption by exposed surfaces. (2) Prevents cracking and spalling of mortar joints, limestone, brick, stucco and concrete due to moisture seepage and subsequent freezing. (3) Protects masonry surfaces from corrosion by smoke and fume deposits from the atmosphere. (4) Prevents absorption of dust, soot and dirt by the surface pores of limestone, brick and concrete and consequently prevents staining due to this cause. (5) Does not discolor as it ages but remains in the same transparent condition as when first applied.

HOW USED: Masterseal should only be applied to masonry surfaces at temperatures above 50 degrees F. Surfaces should be warm and entirely free of moisture. Either sprayed or brushed on. One gallon of Masterseal will cover 125 to 150 square feet of average rough surface, one coat, or 75 to 100 square feet two coats.

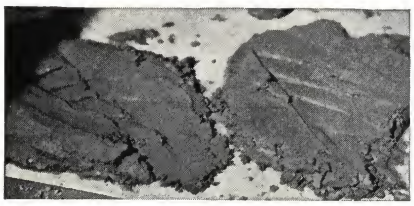
SPECIFICATION: The following areas (here insert specific areas) shall be waterproofed with Masterseal, (here state "No. 1" or "No. 2") applied according to the directions of the manufacturers, The Master Builders Company, Cleveland.

Advantages of

BRIKRON

ARRESTS MORTAR JOINT EFFLORESCENCE—PROTECTS COLORS

Mortar joint efflorescence is caused by soluble salts being brought to the surface by moisture evaporation. The Omicron in Brikron arrests this action at its source by rendering salts highly insoluble. In addition, the powerful waterproofing stearate repels moisture and adds a second check to this action. This protects both brick work and the original color of joint. Left—Illustrating efflorescence. Right—Photomicrograph of soluble salt crystals.



MAKES BUTTERY MORTAR WITH LOW WATER/CEMENT RATIO

The main reason for mortar being so porous is that so much water is required for workability. The Omicron ingredient of Brikron makes a buttery mortar which spreads easier even when a low water cement ratio is used. For details and slump tests illustrating this point, see page 8 on Omicron.

Left: 1:3 mix, 10% Lime. Right: 1:3 mix with Brikron. Brikron mortar has all the plasticity of lime mortar without the disadvantages.

PROTECTS MORTAR JOINTS FROM DISINTEGRATION

Picture above—Example of Disintegration

Repointing mortar joints is expensive. Shrinkage; cracking and spalling from water and frost; deterioration from attacks of sulphurous smoke and fumes, salt air, etc., all are resisted by a Brikron joint due to action of Omicron on the soluble portion of the mortar and to the action of the stearate waterproofing.

WATERPROOFS—DENSIFIES

When water evaporates from mortar, its volume is replaced with tiny air cells called pores. A cubic yard may contain 1½ cubic feet of pores interlaced so that capillary attraction sucks in water. Pores cannot be stopped up but Brikron will line each pore with a water repellent stearate and nullify capillary attraction. Omicron also assists by densifying and by reducing amount of water required.

TO ARREST *Efflorescence* AND *Waterproof* MASONRY MORTAR *specify* BRIKRON

FOREWORD—The subject of masonry mortar is one on which every individual in the construction industry appears to have his own opinion. All agree, however, on the desirability of checking percolation of moisture thru joints, of keeping joints of maximum strength, of encouraging good workmanship thru use of workable mixes and of preventing the appearance of efflorescence.

With the discovery of Omicron by Master Builders Research Laboratories a method is now available for obtaining all these qualities with Portland Cement mortar thru the use of a single product. This product is Brikron.

» **DESCRIPTION:** Brikron is a compound of Omicron and a powerful stearate waterproofing which, when added to masonry mortar in the proportion of one quart per bag of cement, gives the following advantages:

1. Minimizes mortar joint efflorescence.
2. Makes mortar plastic and buttery and yet permits use of lower water/cement ratios.
3 Adds substantially to early high strength as well as to permanent strength.
4. Protects joints from deterioration due to frost action and corrosion from smoke and fume deposits.
5. Protects mortar colors from clouding by lime salt action.
6. Waterproofs mortar joints.

» **OMICRON:** Omicron, one of the two basic ingredients of Brikron, is a discovery of Master Builders Research Laboratories and has the unique ability of forming new and permanent combinations with the waste products thrown off by portland cement during hydration. This action arrests the formation of efflorescence, contributes greatly increased plasticity, adds early high strength as well as permanent strength, densifies the mortar and makes the joint highly resistant to corrosion from acids and alkalis from the atmosphere. For complete details on Omicron see page 8.

» **THE WATERPROOFING INGREDIENT:** The waterproofing ingredient used in Brikron is of the powerful stearate type recommended by foremost authorities. It effectively waterproofs the mortar joints by lining each pore in the mortar (left by the evaporation of water) with a water-repellent coating. This nullifies capillary attraction and makes the joint water tight, protecting it from crazing due to alternate wetting and drying and frost action. The possibility of shrinkage cracks developing between brick and joint is also reduced as less gauging water (with less evaporation shrinkage) is required due to the plasticity added by Omicron.

SPECIFICATION:

All mortar for (here state "brick," "stone," "stucco," "plaster," etc.) shall consist of one part cement to three parts clean well graded sand free of organic matter and shall be tempered with water to which has been added one quart of Brikron per each bag of cement used, following the directions of the manufacturers, The Master Builders Company.

How Used—One quart of Brikron thrown into mixer for each bag of cement. Performs best with portland cement, although it is also effective with natural cements. 1:3 mix recommended. Up to 10% of lime may be used with the cement mix. Packed in 60, 35, 5, 1 gallon steel containers.

STRENGTH TEST

1:3 cement mortar	Comp. strength, lb. per sq. in. 1 day	7 days	28 days
A. Untreated	445	2195	4548
B. With Brikron.....	764	2418	4676

WATERPROOFING TEST

1:3 mix, cement	% absorption water, by weight 1 hr.	4 hrs.	6 hrs.	48 hrs.
A. Untreated	2.08	2.97	2.97	3.42
B. With Brikron	.60	1.04	1.04	1.27*

*Equilibrium—No further absorption on longer immersion.

MASTER BUILDERS INTEGRAL WATERPROOFINGS

Concentrated Liquid . . . Paste . . . Powder . . .

Absorption Test Made for Prominent Architects,* Cincinnati, Ohio, by Independent Testing Laboratory

	Wt. dry, grams	Wt. after 12 hrs. immersion, grams	% of Absorption
M. B. Liquid	65.75	66.37	.95
A. A super cement	63.37	64.125	1.18
B. Well-known brand	62.5	64.0	2.4
C. Well-known brand	63.5	65.5	3.15
D. Void filling powder	58.75	60.875	3.62

*Name on request.

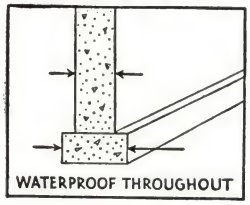
Absorption Test, Robt. W. Hunt Lab., Pittsburgh

Specimen. Time 168 days	Increase in weight, grams	Increase % dry weight
Plain concrete—no waterproofing	11.2	1.13
Material "A"	6.65	.67
Material "B"	7.45	.785
Master Builders Waterproofing Powder	5.65	.585

Quantity Required Per Bag of Cement

Concentrated Liquid Waterproofing	⅔ qt. per 94-lb. sack
Concentrated Paste Waterproofing	1½ lb. per 94-lb. sack
Concentrated Powder Waterproofing	2 lb. per 94-lb. sack

The Integral Method

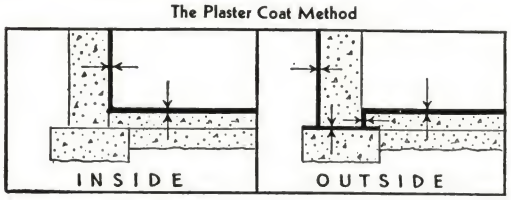


TWO METHODS

Sketch at left shows mass waterproofed throughout.

Lower left—Inside plaster coat method. Lower Right—Outside plaster coat method.

The Plaster Coat Method



» DESCRIPTION

Master Builders Concentrated Integral Waterproofings come in Liquid, Paste and Powder form. When mixed integrally with concrete, they line the pores with a water repellant stearate which changes capillary attraction into capillary repulsion, thus effectively holding out water.

» WHERE USED

Master Builders Concentrated Waterproofings are recommended for use in mass concrete and cement mortar of all kinds, including foundation walls, floor slabs, roof slabs, and all other forms of reinforced or plain concrete.

» MERITS AND ADVANTAGES

(1) All three waterproofings are of the stearate type recognized and recommended by leading concrete authorities and building associations.

(2) All three increase the workability of the concrete making it easy to place in and around specially shaped forms. In the case of plaster, the added plasticity furnishes ease in troweling.

(3) With increased lubrication of a mix or mortar, excessive amounts of water need not be used. This results in less porosity and makes for watertightness.

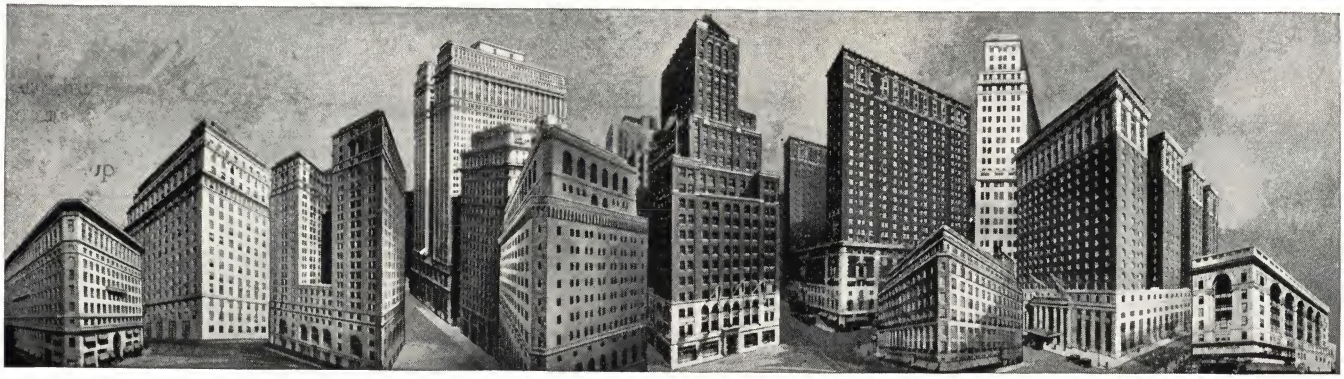
(4) Because Master Builders Waterproofings are concentrated, maximum results are obtained with a minimum amount of waterproofing.

(5) Concentrated Liquid and Paste Waterproofing are exceptionally easy to use, it only being necessary for the mixer man to throw the proper amount of waterproofing into the mixer along with the gauging water. Where Waterproofing Powder is used, the aggregates and powder must be mixed dry for a half minute before water is added.

SPECIFICATION

All cement mortar (or concrete) as indicated shall be waterproofed throughout by the use of Master Builders Concentrated Waterproofing (here insert "Liquid," "Paste" or "Powder") following the directions of the manufacturers, THE MASTER BUILDERS COMPANY, Cleveland, Ohio.

A Few of the Prominent New York Buildings Waterproofed with Master Builders Products



(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)

(1) Lord & Taylor's (2) Ambassador Hotel (3) Pershing Square Building (4) Equitable Building (5) Federal Reserve Bank of New York (6) Farmers' Loan & Trust Co. (7) Commodore Hotel (8) Saks Fifth Ave. Store (9) N. Y. Stock Exchange (10) Pennsylvania Hotel (11) B. F. Keith's Theatre

METALLIC WATERPROOFING

Master Builders Iron Method

THE Master Builders Metallic (Iron) method of waterproofing masonry consists of the application of a watertight metal-cement sheath to the masonry surface. This metal-cement sheath is built upon a masonry wall by either plastering or applying in successive brush coats, a mixture of Master Builders Metallic Waterproofing, portland cement and sand tempered with water.

WATERPROOF THROUGH OXIDATION: Master Builders Metallic Waterproofing will expand many times its original size through oxidation. When mixed with sand, cement and water and applied to masonry surfaces, the metallic aggregate oxidizes and swells, filling the voids left by the water when it evaporates. This provides a metal-cement surface that is watertight even under extremes of pressure.

CHEMICALLY PURE: Perfected by and manufactured under the close supervision of Master Builders Research Laboratories, Master Builders Metallic Waterproofing is chemically pure. It consists of metallic aggregate, processed free of oil, grease and non-ferrous metals and so treated that it will quickly react and oxidize properly without the formation of harmful gas bubbles.

WHERE USED: Master Builders Metallic Waterproofing Method may be used on practically all masonry areas. It may be applied to the exterior and interior surfaces of walls, over footings and floor slabs of basements, tunnels, ducts, vaults, subways, swimming pools, reservoirs, storage tanks, etc. It may be applied to the ground side of retaining walls and upstream side of dams.

HOW USED: On concrete surfaces, successive brush coats of Metallic Waterproofing mixed with sand, cement and water are applied. From two to five coats required depending on the amount of water pressure encountered. On surfaces of unglazed brick, hollow tile, cement block or stone, Metallic Waterproofing and water is applied, followed by a thin coat of cement plaster. This is then followed by successive brush coats of Metallic Waterproofing, cement, sand and water. Calculate two brush coats of Metallic Waterproofing as minimum for all surfaces. Approximately 15 pounds required for a two coat treatment on 100 sq. ft. Packed in 50 and 100 lb. drums. Detailed instructions supplied with each order.

SPECIFICATION: The following areas shall be waterproofed with Master Builders Metallic Waterproofing Method (here insert areas). The Metallic Waterproofing shall be applied according to the detailed directions of the manufacturers, The Master Builders Co., Cleveland.

PLASTER BOND

MASTER Builders Plaster Bond is a high grade Mexican Asphalt of a brushing and spraying consistency that makes possible the practical application of plaster direct to the interior surface of exterior walls. Plaster Bond serves these four purposes: (1) It lines interior surfaces of exterior walls with a watertight asphalt curtain that prevents infiltration of moisture and dampness. (2) It helps shut out cold and retain heat. (3) It provides a tacky, elastic surface to which plaster will adhere firmly. (4) It makes possible the elimination of furring and lathing.

ELASTICITY RETAINED: Being a natural asphalt of highest quality without adulteration by useless fillers Master Builders Plaster Bond retains its elasticity indefinitely which permits it to expand and contract with the masonry surface without cracking.

OTHER USES: Although primarily designed to make possible the practical application of plaster direct to interior surfaces of exterior walls, Plaster Bond serves in other capacities: (1) Used to dampproof exterior walls and prevent moisture from following the furring and staining plaster or warping lath. (2) Used as a rustproof paint on metal lath. (3) Used as a stone backing paint preventing staining and discoloration of light colored stone by moisture from back-up mortar and joints. (4) Used as waterproofing for back of parapet walls. (5) Used as a protective coating for unexposed parts of wood, window and door frames where they come in contact with masonry, thus preventing cracking and warping of wood from this cause. (6) Used as a protective coating for metal surfaces exposed to water, moisture or fume laden air.

HOW USED: Plaster Bond is applied in a two coat treatment. Either sprayed or brushed on. One gallon will cover 80 square feet two coats. Packed in 60 and 35 gallon barrels and 5 gallon cans. Weight—8½ pounds per gallon.

NOTE: Plaster Bond should not be used with portland cement plaster—only with light weight plasters such as lime, gypsum, etc. When applied to concrete, latter should be rough to provide key. Specify integral or metallic waterproofings where portland cement plaster is to be used.

SPECIFICATION: The interior surfaces of all exterior walls shall be given a two coat treatment of Master Builders Plaster Bond applied in a continuous coating and following the directions of the manufacturer.

FOUNDATION COATING

MASTER Builders Foundation Coating is a high grade Mexican asphalt of a brushing and spraying consistency suitable for application to exterior surfaces of foundation walls to make them dampproof. It is of the same quality asphalt as Master Builders Plaster Bond but does not possess the tackiness of this latter material.

ELASTICITY RETAINED: Like Master Builders Plaster Bond, Foundation Coating retains its elasticity indefinitely due to its freedom from fillers and other adulterants that would dry out and make the film brittle.

HOW USED: One gallon will cover 100 square feet of average surface one coat or 70 square feet two coats. Foundation coating may be brushed or sprayed on. Packaged in 60 and 35 gallon barrels, 5 and 1 gallon cans.

SPECIFICATION: Exterior surface of foundation walls shall be given two coats of Master Builders Foundation coating applied in accordance with the manufacturers' directions.

Some Prominent Installations

Carew Tower
Cincinnati, Ohio
Walter Ahlschlager, Inc.,
Architect

Severance Hall
Cleveland, Ohio
Walker & Weeks,
Architects

Statler Hotel Building
Buffalo, New York
Geo. B. Post & Sons, Architects

International Shoe Building
St. Louis, Mo.
H. Reinhardt, Architect

"MASTERBUILT FLOORS PAY FOR THEMSELVES EVERY THREE YEARS"

[The following reports were given by owners of Masterbuilt Floors to independent investigators of the H. P. Gould Co., Chicago]

Northwestern Terra Cotta Co., Chicago—"In 1913, we resurfaced the aisleway with Masterbuilt Floors. That surface is still in good condition despite an increasing volume of traffic. The saving in maintenance (as compared to the previous unhardened floor) has paid for the Masterbuilt Floor five times over. With this experience, it was only natural that we should lay Masterbuilt Floors in our buildings 27 and 28 when they were erected in 1920. Since installation we have not spent $10 in repairs on these Masterbuilt Floors and the surface is perfectly smooth. We have every reason to believe that the floors will last many years more."

Richman Brothers Co., Cleveland: "In 1916, after investigating all kinds and methods of floor building, we laid a third of our total floor space—or over 100,000 sq. ft.—with Masterbuilt Floors. In 1920 we made certain minor additions. Some of these floors were not Masterbuilt Floors. Although four years newer than the Masterbuilt Floors these other floors are not standing up—especially a shipping platform subject to the same heavy trucking as the Masterbuilt Floors. Judging by this comparison, if our present Masterbuilt Floors had been laid in the same manner as the shipping platform, at least 50 per cent of them would have required repair or replacement by this time. At a cost of 20c a square foot, replacing 50,000 sq. ft. would cost $10,000.00. As the original extra cost of the Masterbuilt Floor was only $2,680.00, this gives us a saving of over $7,000.00 which has paid for the Masterbuilt Floors three times over. Our Masterbuilt Floors are still in excellent condition and are good for many years more of service."

PARTIAL LIST OF INSTALLATIONS

Merchandise Mart, Chicago. Graham, Anderson, Probst & White. 5,000,000 sq. ft. Masterbuilt Floors.

Starrett-Lehigh Bldg., N. Y. C. R. G. & W. M. Cory. 1,200,000 sq. ft. Metalicron Floors.

Goodyear Zeppelin Hangar, Akron. Wilbur Watson & Assoc. Masterbuilt Floors throughout.

McGraw-Hill Bldg., N. Y. C. Hood, Godley & Foulioux. 225,000 sq. ft. Metalicron.

Union Terminal Bldgs., Cleve. Graham, Anderson, Probst & White. Master Mix and Metalicron Floors.

Titche-Goettinger Bldg., Dallas. Herbert H. Greene, LaRoche & Dahl. 70,000 sq. ft. Metalicron.

Atlantic City Auditorium, Atlantic City, N. J. 100,000 sq. ft. Dycrome.

New York Central Bldg., N. Y. Warren & Wetmore. 1,000,000 sq. ft. Master Mix Floors and Brick Mortar Waterproofing.

County Court House, Milwaukee. A. R. Ross. 1,000,000 sq. ft. of Metalicron and colored Metalicron Floors.

Boston Consolidated Gas Co., Boston. D. S. Reynolds. 180,000 sq. ft. Masterbuilt Floors.

Louderman Bldg., St. Louis. LaBeaume & Klein. Masterbuilt Floors throughout.

Rikers Island Penitentiary, Rikers Island, N. Y. Sloan & Robertson. 450,000 sq. ft. Non-Slip Metalicron.

National Carbon Co., Cleveland. Private Plans. 200,000 sq. ft. Masterbuilt Floors.

International Shoe Co., St. Louis. H. Reinhardt. Metalicron Floors throughout.

Lippincott Bldg., Phila. Mahlon Dickinson. 100,000 sq. ft. Masterbuilt Floors.

Union Station, Chicago. Graham, Anderson, Probst & White. Masterbuilt Floors throughout building.

Pershing Square Bldg., N. Y. C. Yorke & Sawyer. Brick Mortar Waterproofing throughout.

Willys-Overland Plant, Los Angeles. Corlett & Bulman. 265,000 sq. ft. Masterbuilt Floors.

Firestone Tire & Rubber Co., Los Angeles. Corlett & Bulman. 265,000 sq. ft. Masterbuilt Floors.

John Wanamaker Store, N. Y. C. Private Plans. 100,000 sq. ft. Colored Masterbuilt Floors.

Chrysler Bldg., N. Y. C. W. Van Alen. Colored Masterbuilt Floors in all service areas. Mortar Waterproofing.

Minneapolis Heat Reg. Co., Minneapolis. 1,050,000 sq. ft. Masterbuilt Floors.

Viscose Co., Parkersburg, W. Va. Ballinger Co. 370,000 sq. ft. Metalicron Floors. 900 cu. yds. Waterproofing.

Almar Stores Warehouse, Phila. Ballinger Co. 100,056 sq. ft. Metalicron Floors.

J. C. Penny Warehouse, St. Louis. T. P. Barnett. 800,000 sq. ft. Masterbuilt Floors.

Wyman Partridge Co., Minneapolis. Bartrand & Chamberlain. 360,000 sq. ft. Masterbuilt Floors.

Hospital for Joint Diseases, N. Y. C. Buchman & Kahn. 100,000 sq. ft. Colored Masterbuilt Floors.

Severance Symphony Hall, Cleveland. Walker & Weeks. 15,000 sq. ft. Dycrome Floors.

City Hall, Atlanta. G. Lloyd Preacher. Colored Masterbuilt Floors.

Field Museum, Chicago. Graham, Anderson, Probst & White. 500,000 sq. ft. Master Mix Floors.

Chevrolet Motor Car Co., Buffalo. 210,000 sq. ft. Metalicron.

Paige-Detroit Motor Co., Detroit. 100,000 sq. ft. Masterbuilt Floors.

Sears Roebuck Co., Retail Stores. Throughout country. Colored Masterbuilt Floors.

Montgomery Ward & Co., Retail Stores throughout country. Colored Masterbuilt Floors.

Statler Hotel, Buffalo. Geo. B. Post Sons. Brick Mortar Waterproofing throughout.

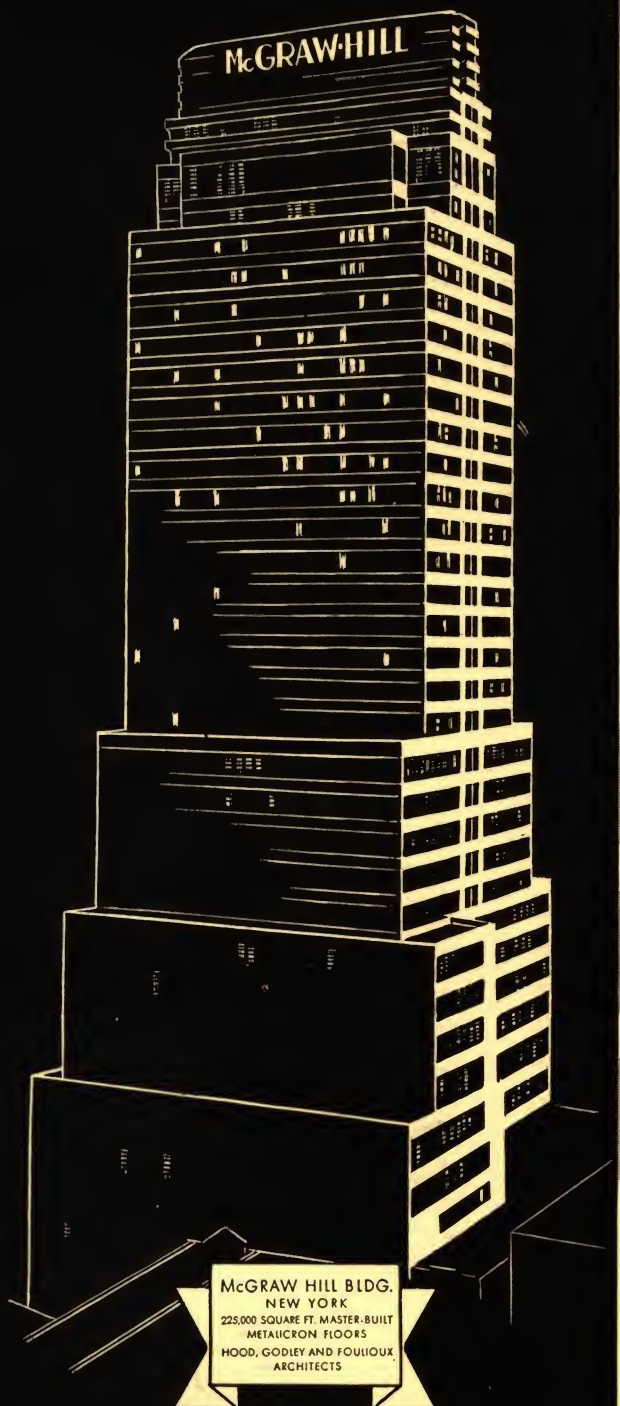
Ambassador Theatre and Office Bldg., St. Louis. Rapp & Rapp. 120,000 sq. ft. Master Mix Floors.

Illinois Merchants Bank, Chicago. Rapp & Rapp. 200,000 sq. ft. Master Mix Floors.

Baldwin Locomotive Works, Eddystone, Pa. Private Plans. 200,000 sq. ft. Masterbuilt Floors.

Field Museum
Chicago, Illinois
Graham, Anderson, Probst &
White, Architects

Presbyterian Hospital
New York City
James Gamble Rogers,
Architect



CONCRETE FLOOR HARDNERS

CONCRETE WATERPROOFINGS

ALLIED TECHNICAL PRODUCTS

BRANCH OFFICES:

ATLANTA	625 Walton Bldg.	MILWAUKEE	774 Broadway
BOSTON	80 Boylston St.	MINNEAPOLIS	434 Builders Exchange
BUFFALO	203 McKinley Bldg.	NEW YORK	441 Lexington Ave.
CHICAGO	228 No. LaSalle St.	PHILADELPHIA	1105 Otis Bldg.
DALLAS	613 Construction Bldg.	PITTSBURGH	422 Fulton Bldg.
DENVER	California Bldg.	PORTLAND	61 Albina Ave.
DETROIT	606 Michigan Theatre Bldg.	ST. LOUIS	Star Bldg.
HELENA	Power Block Annex	SALT LAKE CITY	211 Kearns Bldg.
HOUSTON	1008 Post Dispatch Bldg.	SAN ANTONIO	503 Builders Exchange
INDIANAPOLIS	1021 Hume Mansur Bldg.	SAN FRANCISCO	206 Mills Bldg.
KANSAS CITY	419 Gloyd Bldg.	SEATTLE	314 Seneca St.
LOS ANGELES	1321 Comm'l Exchange Bldg.	WASHINGTON, D. C.	726 Investment Bldg.

The

MASTER BUILDERS CO.

Cleveland, Ohio

NATIONAL WATERPROOFING CO.

ESTABLISHED IN 1909

Waterproofing Engineers and Contractors

1077-1081 Columbus Avenue, BOSTON, MASS.

Products and Services

ENGINEERS and CONTRACTORS for WATERPROOFING, DAMPPROOFING and OILPROOFING.

KENNELLY'S LIQUID (INTEGRAL) WATERPROOFING and OILPROOFING for concrete.

KENNELLY'S DAMPPROOFING PAINT and COMPOUND.

KENNELLY'S CONCRETE FLOOR HARDENER.

KENNELLY'S SEMI-MASTIC, for patching and resurfacing all floors.

General

We will absolutely guarantee all waterproofing done by us to be watertight. We will dampproof without discoloring the outside of any concrete, brick or stone structure and will guarantee the work to be absolutely moistureproof. We will apply a floor hardener to any concrete surface and guarantee the work against dusting or softening of the surface.

All work done by us will be carried on in such a manner that no delay will be caused the general contractor or any part of the work.

Engineering Department

Our engineers are always at the service of architects, engineers, contractors and owners for the solution of waterproofing problems, for preparing specifications and for estimating the cost of waterproofing all concrete structures, foundations, tunnels, dams, reservoirs, swimming pools, etc.

Kennelly's Liquid Waterproofing (Integral Method)

Kennelly's liquid waterproofing is an integral waterproofing liquid which crystallizes in the mass as the cement sets, sealing completely and permanently the voids or pores between the sand and cement against the passage of liquids, even under heavy pressure. It is used in concrete or cement mortar to prevent the penetration of water or dampness. Having practically the same specific gravity as water, it immediately becomes part of the tempering water when poured into the barrel, thus becoming evenly distributed throughout the mass. Kennelly's liquid waterproofing not only renders concrete, mortar and stucco permanently impervious to water, but prevents discoloration and efflorescence, gives additional protection to the reinforcement and increases rather than decreases the strength of the mass. It does not affect the color or setting of cement mortars or concrete.

Kennelly's Plaster Waterproofing

If a watertight plaster finish is desired, put the compound into the water used in making mortar and then place the mortar on the surface to be covered and work it out to the desired finish. By this method, concrete, cement mortar and stucco are rendered permanently moistureproof and pressureproof, the finished surface is not discolored, and the strength of the concrete is increased rather than decreased.

Kennelly's Exterior Dampproofing (Colorless)

A colorless liquid for dampproofing exterior surfaces of stucco, brick, stone and concrete masonry. Also extensively used as a sizing for lime plaster on interior walls before paint is applied. It is applied with a brush. Efflorescence and blotches are caused by the absorption of atmospheric moisture and exudation of gypsum and lime. By the use of our dampproofing, we have overcome these disfiguring features without discoloring the original surface or joints.

We will guarantee to make any building dampproof by this method at a reasonable cost.

Kennelly's Interior Dampproofing (Dark)

A compound for coating interior surfaces of brick, stone or hollow tile walls. Forms a continuous waterproof film or coating on the surface, completely sealing walls and preventing penetration of moisture. This method eliminates furring and lathing and thus effects a great saving, as the plaster may be applied directly to this coating.

Kennelly's Concrete Floor Hardener

A liquid compound either *mixed with the concrete* finish in new floors *or applied to the surface* of old as well as new floors. In buildings subject to heavy wear, the dusting of a concrete floor induces disintegration and crumbling of the concrete and thus ruins the floor. Our hardener insures against dusting, and provides a non-absorbent surface, more impervious to wear than ordinary concrete, makes a durable top surface, and provides a sure non-slip foothold.

Kennelly's Semi-Mastic

A real surface protection for patching and resurfacing all classes of floors, including brick, wood, wood block, cement or concrete, and is waterproof, acidproof, and sparkproof.

Specifications

Integral Waterproofing and Oilproofing—To each 50 gals. of water (1 bbl.) used in tempering the mass concrete, add 6 qts. of Kennelly's Liquid Waterproofing, thoroughly mixing the concrete and carefully spading it into place so as to avoid stone pockets.

Plaster Waterproofing—Material used in same proportion as for integral work, mixing the waterproofing with water used in making concrete mortar and then placing the mortar on the surface to be covered, using 6 qts. of waterproofing to 50 gals. of water.

Dampproofing—Thoroughly clean surfaces to be dampproofed by washing with warm water. Allow to dry, and then apply dampproofing with brush, covering surface well. Allow 4 or 5 hours to elapse before making second application; when thoroughly absorbed, make a third application.

Concrete Floor Hardener—First thoroughly clean the floor surface to be treated by scrubbing with warm water, thereby removing all foreign particles, etc. Allow to dry, and then apply the floor hardener with brush, covering the surface well and allow to dry for at least 4 or 5 hours before making a second application. Should any dry spots appear, treat with another coat of hardener.

References

Fuller & Robinson Co., 95 State Street, Albany, N. Y.
Crocker Burbank & Co., Fitchburg, Mass.
Federal National Bank, Boston, Mass.
Pennsylvania Sugar Co., Philadelphia, Pa.
Westcott & Mapes, Inc., New Haven, Conn.
Stone & Webster Engineering Corp., Boston, Mass.
General Electric Co., Pittsfield, Mass.
United Illuminating Co.'s Plants, Bridgeport and New Haven, Conn.

MINWAX COMPANY, INC.

A Complete Service for Waterproofing, Dampproofing and the Preservation of Masonry and Wood

11 West 42nd Street, NEW YORK, N. Y.

BRANCH OFFICE: 232 East Erie Street, CHICAGO, ILL.

FACTORY: DELAWANNA, N. J.

For Representatives Refer to Local Telephone Directory and Paragraph on Last Minwax Page

Products

There is a MINWAX product for every condition for which Waterproofing, Dampproofing, Caulking, or Surface Protection may be required. This group of products, some thirty individual materials, has been gradually evolved during the twenty-seven years this Company has specialized in this field. The products originated in a natural asphalt of high mineral wax content and unusual waterproofing value, hence the Company name —MINWAX. Each product has developed from a demand for a better solution of some practical structural problem, is tested by our broad knowledge and experience and proven by long service. Together these products comprise a complete and proven waterproofing service.

Engineering Service

Our experience with the application of our products to the great variety of conditions equips us with a special engineering knowledge that we offer, without reservations, to those seeking satisfactory results. The fact that we manufacture so complete a list of products makes our consulting service unbiased and our recommendations based on what experience has shown best for a given condition. As part of this service, our Engineers will present complete recommendations on design and specification and approximate estimates of cost where desired. We do not apply MINWAX products, but are in a position to recommend experienced, responsible organizations who specialize in their application.

Consult with the local representative where possible, or write direct, giving details as completely as practicable.

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For greater convenience our materials have been grouped into four natural divisions with a general discussion at the opening of each division, to serve as a general guide in selecting the most effective methods.

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WATERPROOFING BELOW GROUND LEVEL OR AGAINST PRESSURE

(1) Introduction—Our experience has demonstrated the necessity of two methods of waterproofing against pressure and two materials for protecting against dampness. For waterproofing we find that practically every condition can be met with the greatest directness and effectiveness by either the Membrane Waterproofing System or by the Metallic Method. For dampproofing all conditions can be met by either the standard or emulsified type of asphalt coating. In each case Minwax materials are offered which embody the best qualities inherent in each system.

Based on our observation of results over the past 25 years, we offer the following as a general guide:

Use Minwax Membrane Waterproofing System where there is danger of vibration, load flexure, temperature movement, etc.; and in all other cases where favorable working conditions can be provided and where maximum insurance against leakage is necessary.

Use Minwax Metallic Waterproofing on most work on existing foundations; where proper working conditions for membrane waterproofing cannot be economically provided. Do not use Metallic Waterproofing where movement or vibration may occur, or where slight leakage would be serious or would cause costly damage.

Use Dampproofing on foundations only where no hydrostatic pressures will exist. Generally a proper drainage system should also be provided. The standard and the emulsified type are used almost interchangeably, except that where surfaces may be very damp Minwax Bituloid (emulsion) is better than Minwax Fibrous Brush Coat (standard).

It must be remembered that the foregoing offer only a general guide, and that many problems will require careful special analysis which our engineers will gladly furnish. Specific information on the products follows.

Minwax Membrane Waterproofing

(2) Introduction—The Minwax System is the original Cotton Fabric system, this company having introduced it in 1905 and pioneered in its development. A quarter century of efficient service has made it recognized as one of the highest standards of waterproofing engineering.

(3) Description—The Minwax Membrane System consists of alternate layers of Minwax Waterproofing Asphalt and Minwax Saturated Cotton Fabric forming a built-up blanket or mat constructed so as to envelop or cover the portion of the structure to be waterproofed. In placing, the Asphalt is heated until it is fluid, mopped on the surface and the fabric placed in the hot mopping. This operation is repeated to the required number of plies, the work being handled so as to form a continuous unbroken sheet.

Being the original Fabric System, Minwax has largely formed the basis for the standards established by the A. S. T. M., A. R. E. A., Federal Specification Board, etc. Our materials meet all requirements of these specifications and deliver valuable qualities which could not be included in general open specifications.

Tests—Pittsburgh Testing Laboratories show that the completed 2-ply unsupported membrane is waterproof up to a bursting pressure of 374 lbs. per sq. in. and that there is an elasticity of over 10% for the completed waterproofing.

Tests by Columbia University show that, if not cut, the complete waterproofing will stretch, without rupture, ¼ in. at 0° F. under field conditions.

Uses: ***Open or Above Grade Work***—In this class may be included: terraces or bridge decks under paving, tracks or fill; roofs under tile or masonry wearing course; sidewalks over basements; floors in factories; hotels or clubs where dampness may occur; shower stalls, bathrooms; swimming pools; tanks and reservoirs, etc. In all these cases not only are proper working conditions usually present, without added cost, but such areas are generally most exposed to temperature movement, vibration, load flexure and conditions tending toward cracking. Therefore Minwax Membrane Waterproofing becomes the logical method in every case.

Foundation or Sub-structure Work—In this class may be included not only basements but also tunnels, subways and underground structures generally. In all of these cases a careful study of the design is warranted to provide "proper conditions for application."

(4) Minwax Saturated Cotton Fabrics—This company produces three fabrics known as Minwax Specification Fabric, Minwax Cotton Cord Cloth and Minwax Subway Fabric. The fabric is the reinforcing element analogous to steel in concrete. They are saturated by the same process and woven of the same high quality pure cotton and are, therefore, elastic, tough, pliable and stretchable at all temperatures.

Specification Fabric—A fabric of great strength, suited to the most exacting requirements. The margin of safety which this quality material insures, makes it necessary for the architect or engineer to grant it a small preference.

How shipped—Sheets 36 in. wide, shipped in 50-yd. rolls.

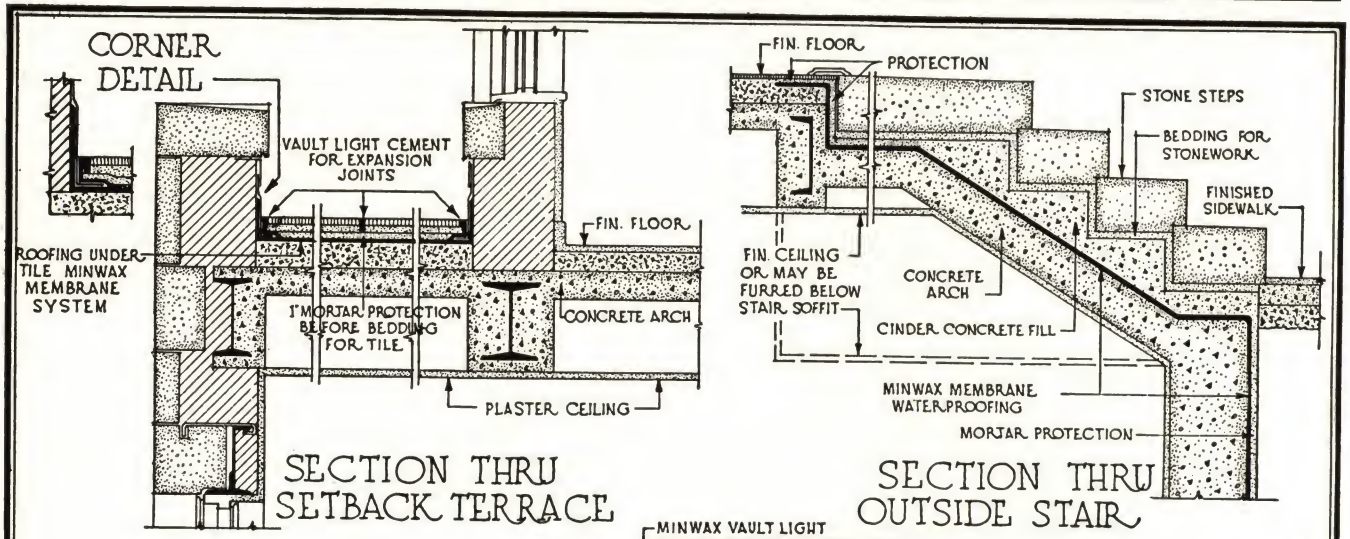
Cotton Cord Cloth—A fabric similar to the above, but lighter in weight and more open in mesh. Possesses every quality necessary to accomplish a first-class waterproofing job. This particular fabric is most widely used and more than meets the average specification.

How shipped—Sheets 36 in. wide, shipped in 50-yd. rolls.

Subway Fabric—A special type developed for New York subway work, lighter than either of the above. An excellent quality which meets the requirements of the general open specification, such as American Railway Engineering Association, American Society for Testing Materials, Federal Specification Board, etc.

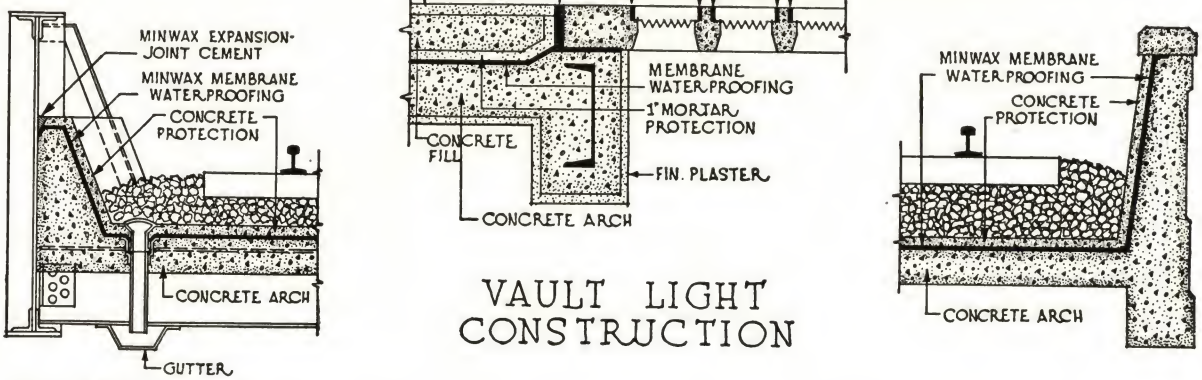
How shipped—Sheets 36 in. wide, shipped in 100-yd. rolls.

Applying Minwax Membrane System of Waterproofing, Marshall Field Mart, Chicago, Ill.



SECTION THRU SETBACK TERRACE

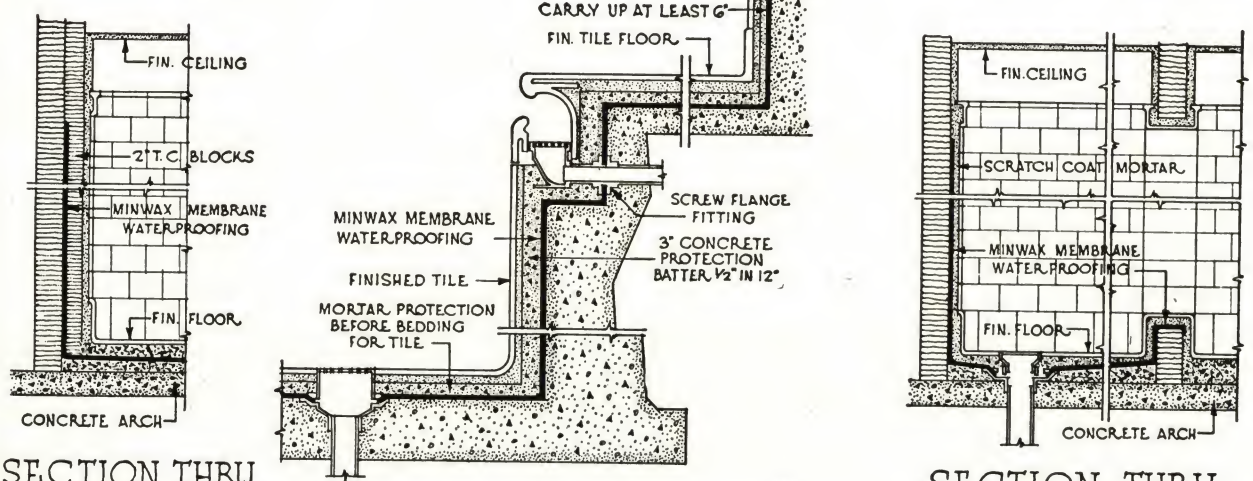
SECTION THRU OUTSIDE STAIR



SECTION THRU STEEL GIRDER R R BRIDGE

VAULT LIGHT CONSTRUCTION

SECTION THRU FILLED CONCRETE ARCH BRIDGE

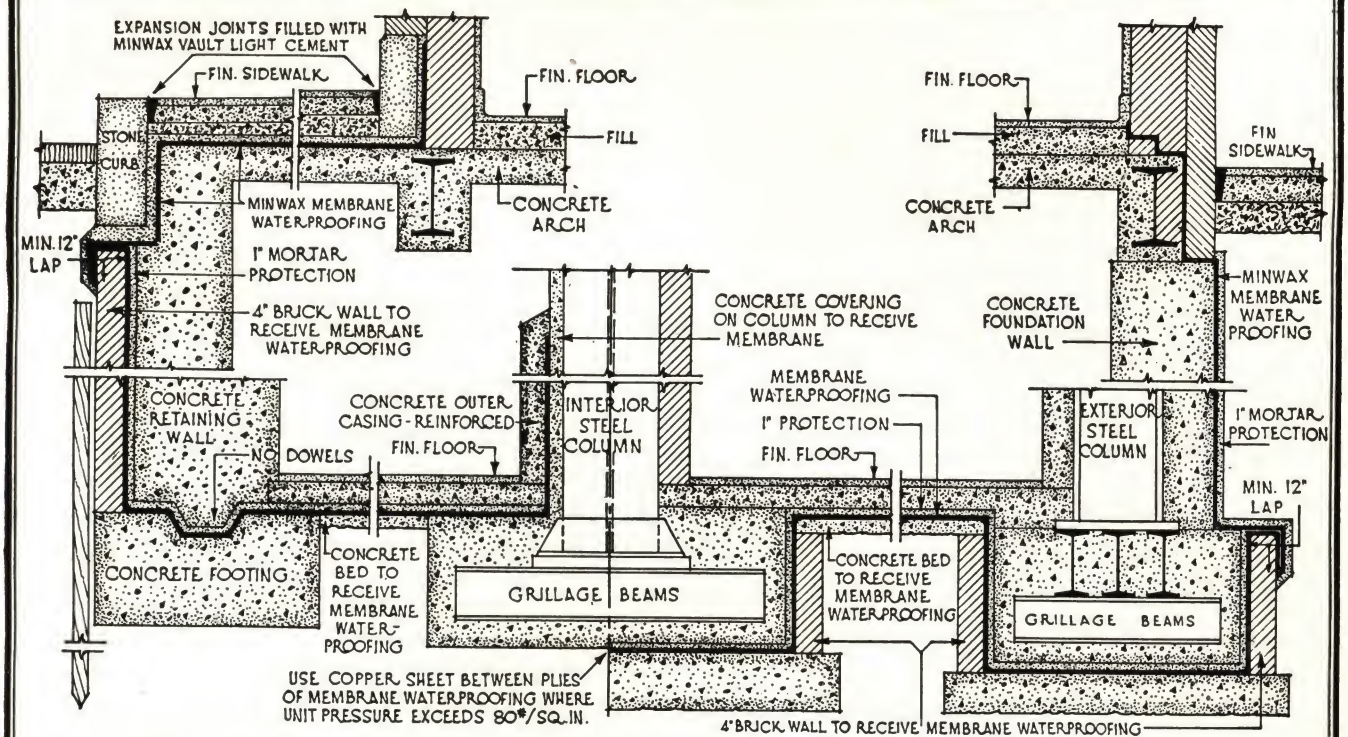


SECTION THRU SHOWER ROOM

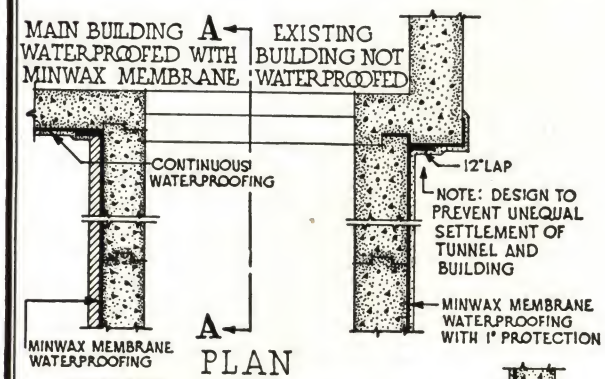
SWIMMING POOL SECTION

SECTION THRU SHOWER STALL

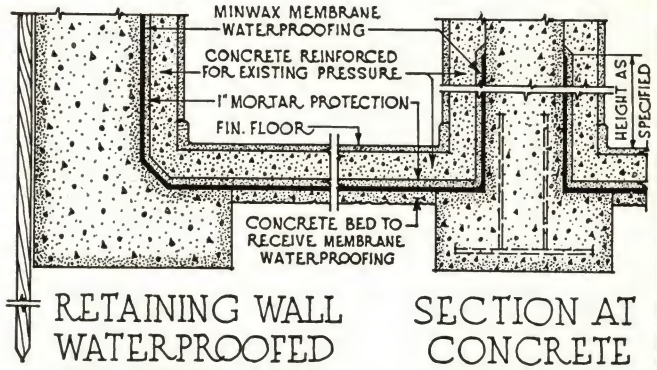
MINWAX CO NEW YORK	ABOVE GRADE DETAILS FOR MEMBRANE WATERPROOFING	PLATE NO. 1 NOT TO SCALE



SECTION THRU CELLAR WALLS & FLOOR

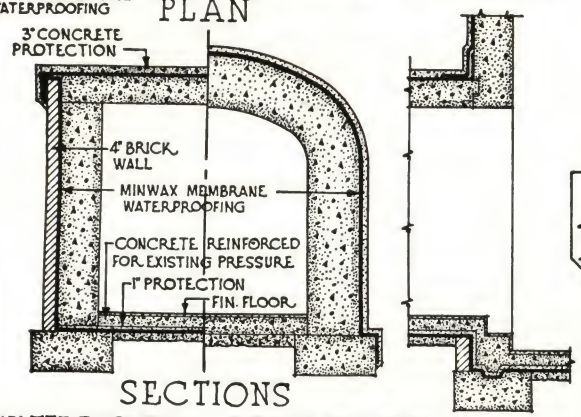


PLAN



RETAINING WALL WATERPROOFED ON INNER FACE

SECTION AT CONCRETE COLUMN

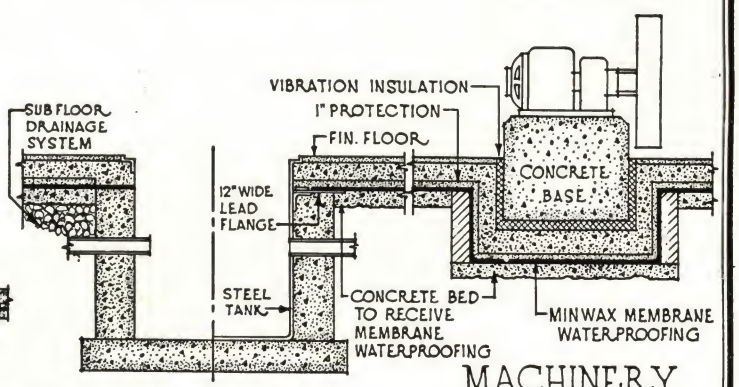


SECTIONS

WATERPROOFED ROOF - SIDES - AND FLOOR

WATERPROOFED ROOF AND SIDES ONLY

SECTION AA



SUMP PITS

MACHINERY FOUNDATION

MINWAX CO. NEW YORK	BELOW GRADE DETAILS FOR MEMBRANE WATERPROOFING	PLATE NO. 2 NOT TO SCALE

(5) Minwax Waterproofing Asphalt—The asphalt is the waterproofing element to be strengthened and toughened by the fabric. The explanation of the wonderful record developed by Minwax Waterproofing Asphalt during the last quarter century is due largely to the use of a certain crude natural asphalt having physical and chemical properties of great value, not found in other asphalts. The full and complete development of these qualities has been the object of our manufacturing and research departments for the past twenty-five years.

How shipped—In sheet metal drums containing approximately 55 gal.

(6) Specification

Note: Attention is directed to drawings on preceding pages.

Materials—(General)—Shall be Minwax (stipulate either Specification Fabric, Cotton Cord Cloth or Subway Fabric depending on grade preferred) and Minwax Waterproofing Asphalt as manufactured by the MINWAX COMPANY, INC., New York and Chicago, applied in the number of plies hereinafter designated and in strict accordance with the manufacturer's directions and under his supervision, or by a sub-contractor approved and recommended by him.

Preparation of Surfaces—(General)—The surface shall be smooth, firm and dry without holes or projections which might cause puncture, wood float or equal, and no work shall be done in wet or freezing weather. Prime all surfaces with one even coat of Minwax Asphalt Primer to uniform brown color and allow to dry before proceeding.

Protection—(General)—All care shall be taken to prevent damage of the waterproofing by other workmen and it shall be protected by mastic, mortar, brick or supporting concrete promptly and under the supervision of the waterproofing contractor. Except where other adequate means are provided not less than ½ in. of portland cement mortar, mixed 1:2, should be applied before any other material is placed.

(7) ***Sidewalks, Floor Construction, Promenade Decks, Tile Roofs, Bridges, etc.***—Waterproofing to be two ply and to flash back of stone base courses, or back of covering, or up parapets, or to turn down on and connect with wall waterproofing, finish or tile to be placed immediately. (Where extra insurance of effective workmanship is desired, as for under tile roofing, etc., specify three ply). All expansion joints in tile, sidewalks or decks shall be filled with Minwax Vault Light Cement.

(8) ***Shower Stalls***—Two ply on floors and up 6 in., one ply on walls, secured to wall at top is usually adequate. On stall construction place mortar directly against waterproofing; in shower rooms place 2-in. furring tile against waterproofing.

(9) ***Swimming Pools, Tanks and Reservoirs***—Waterproofing to be two ply and to extend continuously on the sides and bottom, turning over the tops of the walls and extending across pool room floor, or adjacent construction as shown. All angles to be reinforced with extra sheet, all pipes to have proper flange connections (9 in. all around), protection concrete to be placed immediately and to be self-supporting.

Note: Use a third ply for deep tanks or for extra insurance in pools in upper stories.

(10) ***Foundations***—Pumping provided by the general contractor. The waterproofing of the sub-structure shall be continuous on walls and floors below grade, carried under or up all columns, under and around all pits and trenches beneath the general level of the basement floor connected to sidewalk waterproofing, or carried to a height not less than 6 in. above the joining grades, forming a complete water-tight envelope. If applied on the outside of the walls, it shall be carried through them at level of floor waterproofing courses and protected against backfill by a mortar coat. If applied on the inside of the walls it shall be covered by a secondary wall reinforced to withstand existing pressure.

Three ply should generally be used, with an additional reinforcing ply in pits and trenches and for extra heavy water pressure or difficult working conditions.

Note: All waterproofing must be supported or covered by masonry carefully designed to withstand the maximum expected water pressure.

Quantities—For each square of 100 sq. ft., 12½ yd. fabric are required for each ply; 4 to 5 gal. for each mopping on flat surface, 4½ to 5½ gal. for each mopping on vertical surface.

(11) Minwax Asphalt Primer

Thin liquid primer to assure perfect bond. Allow at least 1 hour after application.

How Shipped—Quart, gallon, 5-gal., 30-gal. and 55-gal. containers.

Covering Capacity—150 sq. ft. per gal.

(12) Minwax Metallic Waterproofing

Description—A finely ground, pulverized iron powder, so chemically treated that, when mixed with portland cement and water, it promptly and tenaciously bonds and seals all pores in concrete, brick and masonry, prevents the penetration and percolation of water.

(13) Specifications—Minwax Metallic Waterproofing is mixed with water and applied in successive coats to the masonry surfaces, which must be cleaned of all laitance, scale or foreign matter. Walls shall receive finish coat of sand, cement and Metallic Waterproofing; floor to be finished with 1:2 cement topping containing 5 lbs. of Metallic Waterproofing per sack of cement.

Note: The wide variety of conditions met, of course, requires variations from the above general procedure. Complete specifications for specific projects gladly furnished.

Covering Capacity—Based on not less than two waterproofing coats and one finished coat, the Metallic Method will require from 30 to 50 lb. of Minwax Metallic Waterproofing per 100 sq. ft.

How Shipped—Shipped in 100-lb. waterproof bags.

(14) Foundation Dampproofing

For foundation dampproofing use either Minwax Fibrous Brush Coat (see par. 27) or Minwax Bituloid (see par. 30 to 35) according to following specifications.

(15) Specifications—Walls shall be coated from grade to footing with 2 thorough applications of Minwax Fibrous Brush Coat, or Minwax Bituloid, allowing 12 hours to elapse between coats. Materials shall be applied cold, without adulteration, with a long handled roofer's brush and well brushed into all surfaces, leaving no voids. Backfill in not less than 12 hours, exercising care to prevent damage of surface. Material shall be thoroughly stirred before and during application.

Note: It is important to provide subsoil drainage to carry off water and prevent development of hydraulic pressures.

ASPHALT CEMENTS FOR EXPANSION JOINTS, CRACKS AND GROOVES

Minwax Vault Light Cement

(16) Description, Uses, etc.—A black, solid, elastic asphaltic compound which is a blend of Minwax Asphalts and special mineral filler for sidewalk or vault light joints in promenade tile decks, swimming pools, reservoirs, tanks, etc. It develops a strong watertight bond to concrete, stone or metal and its reliability has made it standard in the trade. It will not "stew" under sun action or become brittle in cold weather. It should be used only in joints and grooves that are nearly level.

How Shipped—In 1-gal., 5-gal. and 25-gal. containers.

Quantities—One gallon required for each 231 cu. in. of joint.

(17) Specifications—***Tile Roofs***—The joints shall extend through the mortar bedding to the Membrane Waterproofing;

in locations where a protection mortar or concrete is placed over the Waterproofing prior to the placing of the tile, joints shall be formed and filled in this protection concrete separately. All joints shall be not less than 1 in. in width. When joints are thoroughly dry, they shall be brushed very carefully so as to remove all loose material and leave only sound surfaces against which the filling material can bond. Minwax Vault Light or Expansion Joint Cement shall then be heated until fluid, and shall be poured into the joints to within approximately ⅛ in. of the upper surface of the tile.

Arrangement and Spacing of Joints—Joints shall be formed against all upright surfaces, and shall be spaced over the general area of the roof, so as to break it into squares approximately 20 to 25 ft. in size, or as shown on the plans. Where roofs are of irregular outline, spacing and arrangement of joints shall be varied as necessary to provide one full inch of joint width for approximately every 20 to 25 ft. of roof.

(18) ***Specifications for Sidewalk, Swimming Pool, Reservoirs and Similar Joints***—Have the joints thoroughly dry; clean carefully so as to remove all dust and loose material, and prime the sides of the joints with Minwax Asphalt Primer. Caulk the bottom of the joints with spun oakum driven firmly but not packed hard so that it might interfere with movement.

Heat Minwax Vault Light Cement until it will flow, and pour it into the cracks. An especially effective seal will be obtained by re-heating the surface of the joint with a torch after the material has cooled.

Caution: This material should never be used on joints having a greater slope than normally required for roof or sidewalk drainage.

Note: Caulking is required to assure a sound bed and prevent the plastic asphalt from being forced through fissures at the bottom of the joint.

(19) Minwax Fibrous Expansion Joint Cement

Description, Uses, etc.—This material is similar in all respects to Minwax Vault Light Cement except that it is slightly softer. It will remain quite soft at low temperatures and will therefore take care of considerable movement. The fibre keeps it from flowing in summer. It is particularly useful for expansion joints in waterproofing membrane and as a mop coating for shrinkage joints in retaining walls and floors.

How Shipped—In 1 gal., 5-gal. and 25-gal. containers.

Quantities—One gallon required for each 231 cu. in. of joint. Applied by mop or brush; 1 gal. to each 15 sq. ft. of surface.

(20) Specifications—Joints must dry. Sides of joints shall be primed with Minwax Asphalt Primer, after which Fibrous Expansion Joint Cement (heated) shall be poured into the joints or applied with mop or Tampico fibre brush.

WATERPROOFING OUTSIDE WALLS ABOVE GRADE

(24) Introduction—This subject including parapet projection, should be considered and specified under one head as a complete proposition, thus centering responsibility. The ideal method would be **(1)** dampproof the inner face of the outside wall to prevent built-in dampness from affecting plaster and paint; **(2)** provide damp courses under copings over foundations and over window heads; **(3)** treat the exterior surface with Transparent or Colored Waterproofing to keep the whole wall dry, to stop penetration of stains and to prevent the development of efflorescence, etc.; **(4)** caulk around the window frames and other joints where movement might occur, as in copings, cornices, etc.

In steel frame construction, especially in combination with hollow tile walls and particularly where treatment of the exterior surface is not required, spandrel waterproofing would be included at floor lines.

The Minwax Company manufactures the highest quality of materials for all the above purposes, as described in detail under the following headings. Individual problems will be gladly analyzed and complete recommendations presented.

(1) MINWAX ASPHALTIC DAMPPROOFINGS

For Dampproofing Outside Walls Underneath Plaster and Below Ground:

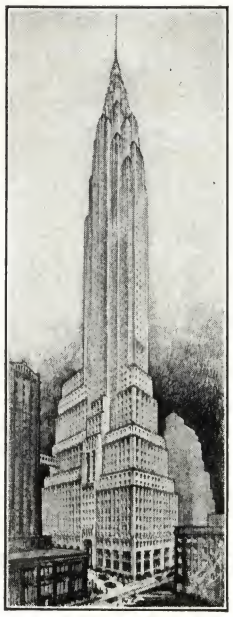
(25) Introduction—There are two general types of asphaltic dampproofing, the standard type here described and the emulsified type described below under the heading Minwax Bituloid. They can be used interchangeably for many uses, Bituloid being particularly suited for application on damp surfaces.

In each type there is a choice of consistencies, the heavier consistencies being produced by reinforcing the coatings with asbestos. In general, the heavier consistencies, by filling holes and cracks, offer greater insurance and should be specified for very severe exposures. Positive results can be had with all types offered if specifications are followed.

Minwax Dampproofing

(26) Description—A full-bodied, black liquid coating based on Minwax Waterproofing Asphalt, which is combined with special chemically inert solvents to make a material that forms a tacky, plastic, lasting dampproof coating which never hardens, and to which plaster will adhere perfectly even after months of exposure. It also resists the acid and alkali conditions that are met in the type of work for which it is recommended.

(27) Minwax Spray Coat Dampproofing—Is the above material in a consistency suitable for spray application or for applying with brush. Recommended for concrete and solid brick masonry.



Cities Service Building, New York

Minwax materials used for all waterproofing requirements above grade

(28) Minwax Fibrous Brush Coat (Brush Mastic)—This is the same material with the addition of asbestos fluff as a filler and reinforcing agent. It works well under the brush and insures filling incidental holes and cracks. Recommended for concrete and solid brick masonry and especially is best suited for foundation dampproofing (see paragraphs 14-15). Brush applied.

(29) Minwax Trowel Coat Dampproofing—This is again the same material but with the proportion of asbestos fluff increased to bring the material to mastic consistency and insure filling the larger cracks and holes that develop in the hollow or "back-up" tile construction.

For trowel application dampproofing, particularly over hollow tile, also for spandrel waterproofing, waterproof cut-off under copings, over window heads, under sills, etc., spandrel waterproofing, cork insulation protection.

Covering Capacity—Spray Coat Dampproofing and Fibrous Brush Coat—80 to 125 sq. ft. per gal. per coat. Trowel coat 20 to 30 sq. ft. per gal. ⅛ in. thick; 10 to 15 sq. ft. per gal. ⅛ in. thick.

How Shipped—5-gal. pails, 30 and 55-gal. drums.

(30) Specifications—***Spray Coat and Brush Coat***—Apply two thorough coats so as to form a continuous heavy adhesive coating on the surface. Allow 12 hours between coats. Apply plaster in not less than 24 hours or more than three weeks after application.

Trowel Coat—Apply one uniform continuous coat minimum thickness $\frac{1}{16}$ in. with trowel. Apply plaster in not less than five days or more than three weeks after application.

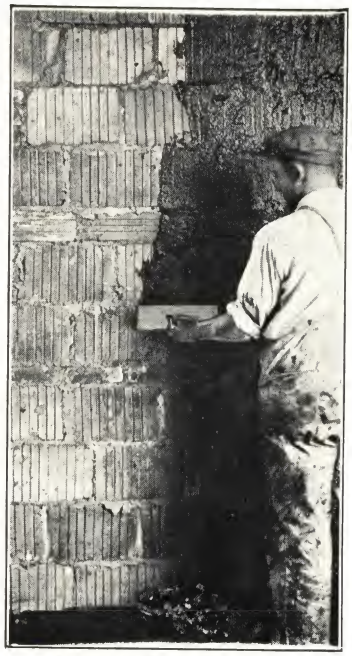
Note: Not recommended for concrete ceilings, or conditions where weight of plaster is largely suspended from the coating, or under cement plaster.

Minwax Bituloid (Emulsified Asphalt)

(31) Description—Minwax Bituloid is an asphalt emulsion—a dispersion of pure asphalt in water. It represents the highest development in this type of coating and offers all the advantages inherent in emulsions: applicability on damp surfaces; low susceptibility; miscibility with cement, etc.

Bituloid is produced in two consistencies: Plain for spray or brush application; Fibrous for brush or trowel application.

(32) Specifications for Use of Bituloid—***Preparation***—All surfaces to be coated whether of concrete, steel or wood, shall be clean and free from dust, oil or loose scale.



Applying Trowel Mastic Dampproofing

No coating work shall be carried on at temperatures below 40 deg.

(33) ***Bituloid (Plain)***—For brush application apply two thorough coats, thinning the first coat with water, to assure penetration. If surfaces are specially dry or dusty, wet with clean water before applying first coat. Apply second coat without dilution, just as received. For spray application Bituloid must be strained through a fine sieve or strainer when placing in material container.

(34) ***Bituloid (Fibrous)***—Apply priming coat of Bituloid (Plain), thinned with 30% water, and when dry to the touch apply Bituloid (Fibrous) with a trowel to the required thickness. For brush application, thin with water to proper consistency.

Note: Bituloid, being a water emulsion, can be frozen and when frozen the product is destroyed and of no further use.

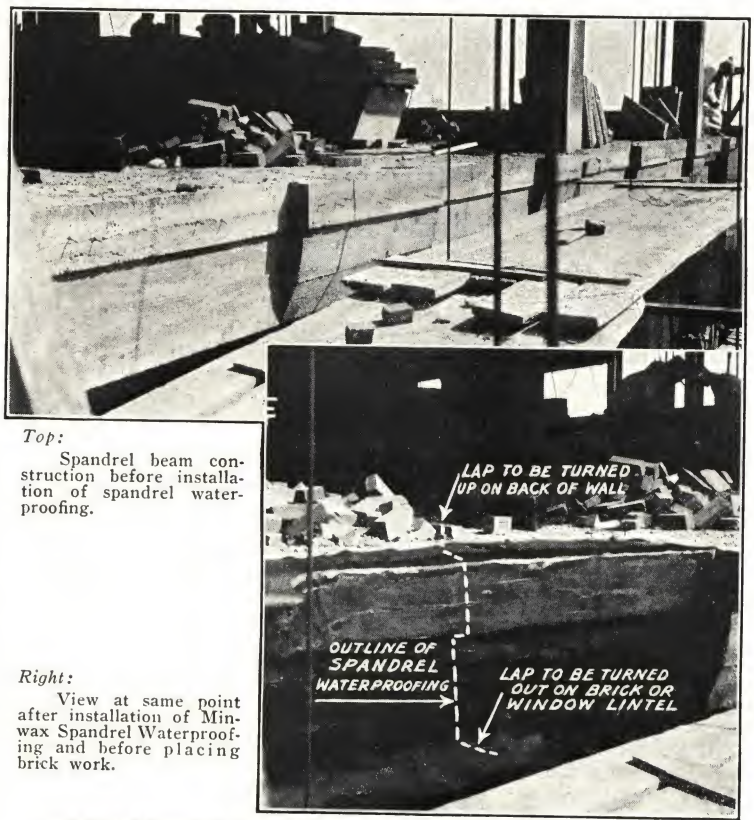
Covering Capacity—Plain—approximately 100 sq. ft. per gallon per coat; Fibrous—15 to 20 sq. ft. per gallon $\frac{1}{16}$ in. thickness.

How Shipped—5 gal. steel pails, 30 and 55 gal. steel drums.

(2) MINWAX SPANDREL WATERPROOFING AND DAMPCOURSES

(35) Description—The Minwax method for dampcourses and spandrel waterproofing uses a tough, asphalt saturated fabric, gaining strength, toughness and pliability, which assures against the tearing which occurs with paper, or the break in the masonry bond which occurs with metal. Complete waterproofness is assured either by applications of Minwax Trowel Coat Dampproofing in the field (Built-in-Place method), or by the use of a heavier, closely-woven cotton fabric, which is coated as well as saturated at the factory and which is waterproof in itself (Full-seal method). The formation of a waterproof membrane or cut-off through outside walls, by either of these methods, prevents seepage of water which may enter from rains, or of dampness from foundations. At spandrel beams at floor levels, it is connected to the dampproofing which is under the plaster (see drawings), making this dampproofing of the outside walls continuous. It is used as flashing under and over windows, under coping, over foundation walls, etc.

(36) ***Minwax Full-Seal Fabric***—Is a strong, tough, closely woven pure cotton fabric, perfectly sealed, fully saturated and coated with Minwax Waterproofing Asphalt, so that it needs only the final surface seal in the field. Its character prevents the breaking of the masonry bond which would be caused by metal pans or cut-offs, while its toughness and pliability permits it to be left loose and afterwards to be built into place by the masons without danger of tearing, so that spandrel waterproofing can be done well in advance of brick work.



Top: Spandrel beam construction before installation of spandrel waterproofing.

Right: View at same point after installation of Minwax Spandrel Waterproofing and before placing brick work.

Installing Minwax Spandrel Waterproofing in R. C. A. Victor Building, New York, N. Y.

(37) Specifications—***Built-in-Place Spandrel (General)***—For Built-in-Place Spandrel, surfaces shall be smooth, without sharp projections, wires or hardened mortar. All mortar shall be sufficiently set so no free water is present. Apply a full heavy coat of Minwax Trowel Coat Dampproofing (Fibrous Bituloid alternate) into which set one layer of Minwax Cotton Cord Cloth (Subway Fabric alternate) so as to extend from within 1 in. of the face of the wall to 4 in. beyond the line for the inside face of the wall for turn-up, as indicated by drawings. Apply over the fabric a second coat of Trowel Coat Dampproofing so as to completely conceal the weave of the fabric.

All laps shall be at least 3 in. and shall be carefully sealed. Where fabric is bonded to steel as at web of beam, the second trowel coat shall be carried onto the steel 3 in. beyond the termination of the fabric.

Placing—See note and refer to details on following page.

(38) ***Full-Seal Spandrel (General)*** The surfaces shall be furnished sufficiently smooth so that no sharp edges protrude and all ends of wire reinforcing of arches shall be bent over the flange in a proper manner. At spandrels the bevel of cement mortar shall be placed over the top of the beam.

The above work shall be performed by the mason contractor and after it is sufficiently set, the surface of the brick and the upper surface of the beams shall be given a coat of Minwax Trowel Coat Dampproofing and into this shall be set one ply of Minwax Full-Seal Fabric, as shown on drawings, to within 1 in. of all exposed surfaces. The upper surface of this fabric shall then receive one uniform coat of Minwax Trowel Coat Dampproofing. For spandrel and cut-offs connecting to dampproofing under plaster, the sheets shall be cut to widths so that they will extend not less than 4 in. beyond the inside face for turn up connection. All laps shall be at least 3 in. and shall be sealed between the sheets and over the top of the laps with Minwax Trowel Coat Dampproofing. All edges as turned up against inside face of wall or at outside edge shall be laid in and buttered thoroughly with Trowel Coat Dampproofing.

Note: Spandrel Waterproofing is generally carried continuously down the face of the spandrel, the soffit being first bricked in. However, where the depth of the spandrel beam requires the use of "header courses" for effective masonry bond, the spandrel waterproofing can be laid in two courses, one at the upper flange and a second connected to the web and out to the face of the wall at the lower flange or window-head line.

(39) ***Dampcourses and Waterproofs***—These can be built by either the Built-up or Full-seal Method. Generally Full-seal Method is more convenient requiring only one coating which can be effectively applied by brush using Minwax Fibrous Brush Coat.

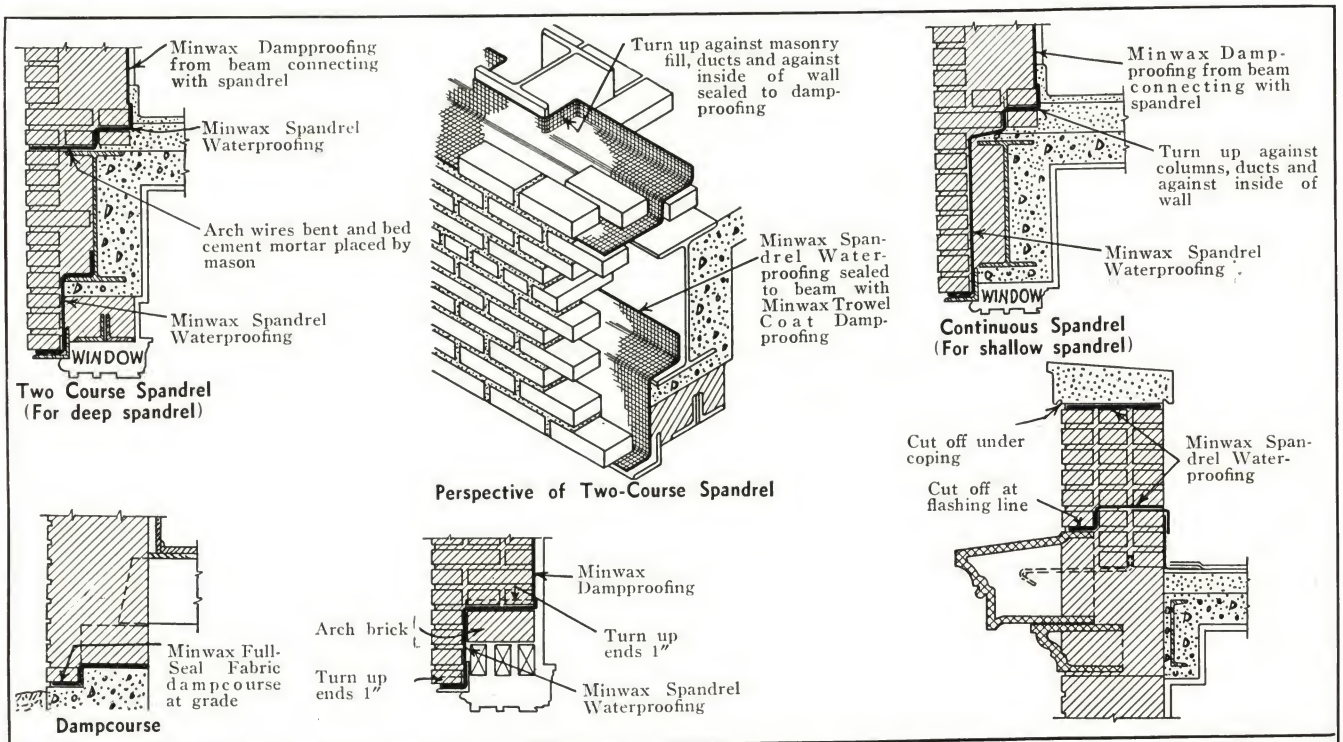


PLATE NO. 3—DETAILS OF MINWAX SPANDREL WATERPROOFING, DAMPCOURSES, ETC.

(3) MINWAX TRANSPARENT WATERPROOFING

For application to exterior surfaces for waterproofing, frostproofing, stainproofing and preserving Concrete, Brick, Stucco and Stone.

(40) Introduction—There are three types of Minwax Transparent Waterproofings: Minwax Clear Waterproofing for concrete, stucco, stone and brick surfaces; Minwax Heavy Clear Waterproofing for especially porous brick, stucco or concrete and for surfaces subject to immersion; Minwax Colorless Waterproofing for limestone, artificial stone, cream-faced brick and other light colored surfaces. These three types are necessary to most efficiently meet the wide variety of conditions and materials for which a penetrative surface waterproofing is required.

Advantages—All Minwax Transparent Waterproofings are liquids applied as received with a brush or spray. Ease of application assures positive effective results regardless of the character of the surface. When applied they penetrate into and below the surface for a considerable depth, sealing all pores and making the material waterproof. There is, therefore, nothing to be worn off, broken through or to scale loose; the waterproofing is really inside the surface. Minwax Transparent Waterproofings are applied as the final application, protecting the finished job, sealing checks and porous spots. They are independent, positive, insurance against moisture penetration. Their waterproofing value is highly permanent, the result of the mineral wax base, and is proven by 24 years' service and test.

How Shipped—All Minwax Transparent Waterproofings are shipped in 1 and 5-gal. cans, 30 and 55-gal. drums.

(41) Minwax Clear Waterproofing

Description—For concrete, stucco, stone and brick surfaces. A light amber-colored liquid which, when applied, penetrates deeply into the surface and cures, depositing a tough mineral gum which in two applications will completely fill and seal the surface. Its action is purely physical or mechanical rather than chemical and is absolutely positive and independent of the nature of the surface to be waterproofed. It does not form any film or deposit on the surface or change the texture in any way. It changes the color slightly, which change decreases in time.

Covering Capacity—Saturate surface. Generally requires 1 gal. for each 200 to 250 sq. ft. per coat on concrete and stucco; 150 to 200 sq. ft. per coat on brick.

(42) Specifications—***General***—Surfaces shall be thoroughly dry, clean, sound and all bed and vertical joints shall be solidly filled; shall show no holes, voids, or cracks. On new work the waterproofing contractor shall inspect the con-

dition of the wall prior to starting work and shall report to the architect and contractor any unsatisfactory pointing. No work shall be done at temperature below 50°; immediately before starting application dirt and dust shall be brushed from the surface. Apply two thorough saturating coats with brush of air spray, saturating the surface and working the material into all roughness at each coat. Do not permit excess to accumulate; remove with rags excess left on dense surface. Waterproofers shall do incidental pointing as necessary, rubbing Minwax Gray Caulking Compound, color to match the color of the mortar, into small cracks or holes immediately after the first coat of waterproofing.

Allow 24 hours between coats.

(43) ***Wall Waterproofing***—All exposed surfaces must be waterproofed from roof flashing over and including coping and down outside surface to grade. Test all brick joints and repoint as necessary, repairing or replacing loose stucco or concrete. Apply 2 coats as above specified. Re window: See Minwax Caulking Compounds.

(44) ***Preventing Efflorescence***—Wall must be allowed to become absolutely dry, work should only be allowed to be undertaken under most favorable conditions. Clean off existing efflorescence with wire brush or dilute muriatic acid solution. When surface is thoroughly dry proceed as above for wall waterproofing.

California Club, Los Angeles, Calif.
Minwax Clear Waterproofing used on all exterior surfaces

(45) Minwax Heavy Clear Waterproofing

For especially porous brick stucco or concrete and for surfaces subject to immersion. This material is heavier grade having a larger percentage of mineral wax and is applied and functions in the same way as Minwax Clear Waterproofing.

Covering Capacity—See Minwax Clear Waterproofing.

Specifications—See Minwax Clear Waterproofing.

Special Note: No work shall be done at temperatures below 60° F.

(46) Minwax Colorless Waterproofing

For limestone, artificial stone, cream colored face brick and light colored surfaces. This material, developed from Minwax Clear Waterproofing, deposits a superrefined mineral wax supplemented by certain preservative water-repellent chemicals and causes no change in color on the lightest surfaces.

On artificial and natural stone, Minwax Colorless Waterproofing performs three important functions: (1) Applied at the mill it protects the surface of semicured stone from absorption of dirt and stain while in transit and prior to setting. (2) In the completed job it waterproofs the exposed surface so as to prevent the accumulation of grime and stain and assists in keeping the building in a light, clean condition. (3) It prevents water and frost action and serves as a protective preservative treatment against disintegration and weather.

Covering Capacity—Saturate surface. Generally requires 1 gal. for each 150 to 300 sq. ft. per coat.

(47) Specifications—***General***—Same as for Minwax Clear Waterproofing except that this material can be satisfactorily applied at temperatures down to 35° F.

(48) ***Cut Stone (new)***—All stone shall be absolutely clean and dry before application of the waterproofing. After erection and cleaning and when dry, all exposed surfaces shall receive the second thorough saturating coat of Minwax Colorless Waterproofing. Special attention shall be paid to horizontal and protecting surfaces as at cornices, copings, etc.

(49) ***Existing Stone Work***—Surfaces shall be cleaned down by washing with soap and water or sandblasting and shall receive 2 thorough saturating coats of Minwax Colorless Waterproofing applied with a brush or spray, 12 hours between coats.

(50) Minwax Brick and Cement Coating for Waterproofing and Decorating Exposed Surfaces of Cast Concrete, Brick or Stucco

This Minwax Product is a pigment coating produced in a series of attractive flat color tones. It is a combination of the highest grade inert mineral pigments obtainable in a carrying vehicle based on Minwax Clear Waterproofing (one of the oldest, best known and most efficient mediums for exposed wall waterproofing). For full description, see Manufacturers' Index for our catalogue in another section.

(4) CAULKING MATERIALS FOR AROUND WINDOWS, ETC.

(51) Introduction—In discussing the question of caulking materials we refer to materials required not only for caulking around windows but for caulking joints in masonry, coping, parapets, etc., or wherever an elastic watertight joint filler is required for walls above grade.

There are two basic requirements a caulking compound must meet: first, it must form and maintain a watertight bond; second, it must remain elastic so as to take up movement. All compounds must meet these requirements, but for some classes of work the color of the compound is occasionally important, so is its tendency to stain or not to stain the surface. Therefore, we manufacture two types: first, asphaltic compounds for locations where color and staining are not important; second, gray and buff compounds, for locations where color and stain are important. The gray and buff is made in two consistencies, depending on the method of application desired.

Applying Minwax Gray Caulking Compound No. 1 with Minwax Hand Caulking Gun

(52) Minwax Asphalt Caulking Compound

A black, fibrous asphaltic putty, compounded of Minwax Asphalt and asbestos fibre, for caulking around windows, for shrinkage joints, masonry floors, walls, and for general joint work where a plastic asphaltic material which can be applied cold is required.

This type is lower in cost than the gray or colored compound. It will work equally well with a trowel, hand caulking tool or hand caulking gun (supplied by Minwax Company, if desired).

How Shipped—In 1, 5 and 10-gal. containers.

Covering Capacity—For windows, full depth joints, four to six average windows; corner bead only, eight to ten average windows. As seal for shrinkage joints, trowel coat ⅛ in. thick, requires 1 gal. for each 10 to 14 sq. ft. Other types of joints can be figured on the basis of 1 gal. for every 231 cu. in. of joint.

(53) Specifications—For shrinkage joints at pilasters, etc., apply heavy coating Minwax Asphalt Caulking Compound with trowel and build masonry against it. For windows, see below.

(54) Minwax Gray Caulking Compound (Gray and Buff)

The inherent advantage of this type of material is that it can be produced in light colors or in colors to match trim, that it is practically non-staining and that it can be efficiently and satisfactorily painted over. This material is a combination of specially treated oils and gums in combination with mineral fillers, which after it is installed, cure to a resilient homogeneous mass that is absolutely weatherproof and which adheres tenaciously to the sides of the joints whether masonry, wood or steel. It is made in two grades, No. 2 (heavy), for application with a hand caulking tool, and No. 1 (soft) for application with a hand caulking gun (supplied by Minwax if desired).

For best and most permanent results, the sides of the joints should be primed with Minwax Caulking Primer before this material is used. This stops the suction of the masonry or wood and prevents it from drawing out the oils before they have been properly cured.

How Shipped—Shipped in 5-lb., 25-lb., 50-lb., and 100-lb. containers.

Covering Capacity—3 to 5 ft. of joint, ¾ in. deep per lb.; surface corner bead 9 to 10 ft. per lb., or 1½ to 2 lb. per average window.

(55) Minwax Caulking Compound Primer—This is a liquid for sealing the surface of masonry wood joints before the use of Minwax Gray Caulking Compound applied in one coat with a suitable brush.

(56) Specifications—The same general specifications apply to all of the above materials and the selection between materials will depend on whether or not it is essential to have a light colored joint and non-staining material, in which event specify Minwax Gray Caulking Compound, or whether the black asphaltic compound would be satisfactory as to appearance—specify Minwax Asphalt Caulking Compound. From the standpoint of efficiency, each material will give splendid and permanent results.

(57) ***Wood or Hollow Metal Frames***—Pack space to within ¾ in. of face with oakum and fill solidly with Minwax Asphalt Caulking Compound (or Minwax Gray Caulking Compound as explained above) forced in, carrying caulking, to stone sill in all cases. Caulk head and sill in the same manner.

(58) ***Steel Frames***—For new work butter inside edge of masonry opening or surfaces of sash to be embedded with thin coat of Minwax Gray Caulking Compound (or Minwax Asphalt Caulking Compound, as explained above). Caulk finished job or old work around head, jamb and sill carefully with same compound applied with trowel; finish to neat bead. Set cast metal door saddle or sill in Minwax Asphalt Caulking Compound.

(59) ***Pointing Stone, Terra Cotta, etc.***—Rake out all joints for elastic pointing ¾ in. deep. Paint sides thoroughly with Minwax Caulking Primer, and fill with Minwax Caulking Compound, color to match or as selected. Horizontal joints in copings, cornices, sills, etc., especially important.

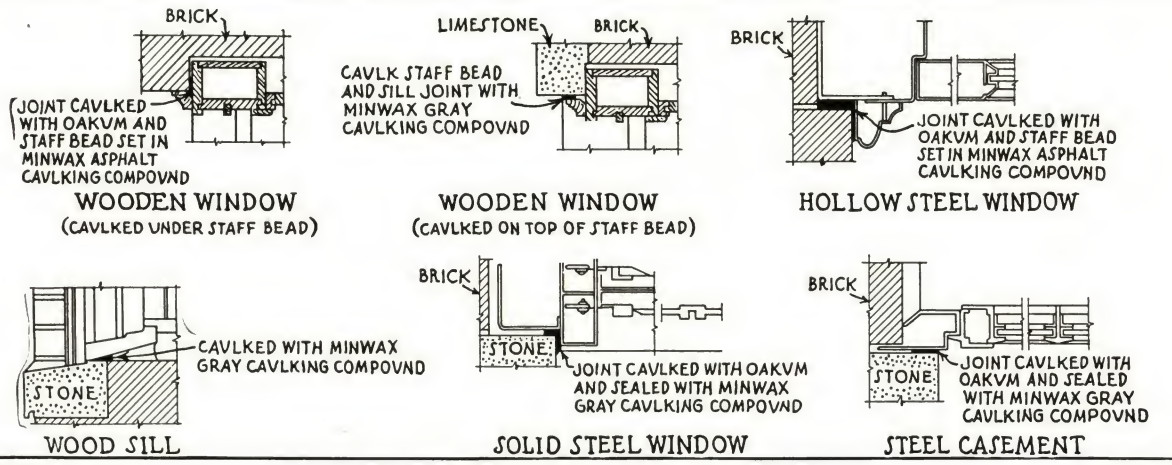


PLATE NO. 4 — WINDOW CAULKING DETAILS — NOT TO SCALE

TREATMENTS FOR FLOORS

(60) Treatment for Masonry Floors

Introduction—We produce three separate materials for masonry floors which we have found meet all requirements for almost every condition we have met in the past twenty-five years on all types of floors, including concrete, terrazzo, magnesite, tile, marble, slate, etc. These materials are all applied after the floor is complete and acts through placing a tough mineral gum inside the surface of the floor, adding toughness and density. The materials are, first, Minwax Concrete Floor Finish, for all average conditions on concrete, terrazzo, magnesite, tile, and marble floors; Minwax Colored Concrete Finish, a stain finish for concrete floors; and Minwax Concrete Floor Paint, a high quality gloss floor enamel.

(61) Minwax Concrete Floor Finish

Fills the pores in the surface and subsurface of concrete floors with a tough mineral gum. Applied cold as a liquid after the floor has dried and cured, its action is mechanical and positive, creating an absolutely dense smooth surface. It thus eliminates the cause of dusting and disintegration and prevents the penetration of water, stains or liquids of any sort. The mineral gum is highly resistant to and gives maximum protection against the action of brine, creamery and packing plant acids, or oils and dilute acids found in industrial plants, and makes the floors highly sanitary.

On terrazzo and marble tile it brings out color, creates an easily cleaned sanitary surface and prevents dusting and staining. On composition and magnesite it prevents stains, disintegration by water and kills salts.

Covering Capacity—Concrete and composition, 200 to 400 sq. ft. per gal. per coat; terrazzo, marble and tile, 400 to 600 sq. ft. per gal. per coat.

How Shipped—In 1, 5, 30 and 55-gal. containers.

(62) Specifications—***Concrete, Magnesite, etc.***—Floors shall be clean and dry. For concrete and composition floors,

apply 2 saturating coats with "T" head cotton floor mop leaving no puddles or excess material, allowing 12 hours to elapse between coats. Second coat to cure 24 hours before using.

(63) ***Terrazzo, Tile, etc.***—Mop up surface with water to remove all dust and as soon as surface appears uniformly dry apply first coat of Minwax Concrete Floor Finish. Cross-mop first coat to even out and take up surplus. After 24 hours apply second coat in same manner. Dense tile or terrazzo should be wiped up with dry rags 2 hours after each coat and polished with an electric polisher just before occupancy.

(64) Minwax Colored Concrete Floor Finish

Penetrating and permanent stain colors are added to Minwax Concrete and Terrazzo Floor Finish at the factory and the Minwax Colored Concrete Floor Finish delivered on the work ready for use. These stains bite well into the surface, giving a soft textured color that will resist even concentrated wear. It is especially valuable for integrally colored concrete and magnesite floors that show uneven appearance.

Covering Capacity and Shipping Packages—Same as Concrete and Terrazzo Floor Finish.

Colors—Gray, linoleum and seal brown, Egyptian and tile red, forest green.

(65) Specifications—Floors shall be clean, dry and absolutely free from dust and stain. Wash surface carefully with 10% muriatic acid solution to remove laitance. Flush with clean water and allow surface to dry. Apply 1 thorough coat of Minwax Colored Concrete Floor Finish with a mop, cross-mopping the surface half hour after application to spread material uniformly. After 24 hours apply second coat in exactly the same manner, and about 2 hours after applying the second coat, wipe up the surface thoroughly with dry rags.

In 4 or 5 days or before occupancy sweep the floor, apply Minwax Finishing Wax in color to match and polish with electric polisher.

(66) Minwax Concrete Floor Paint

A high quality long-lived durable floor enamel. Two coats recommended.

Standard Colors—Buff, light gray, dark gray and red.

Covering Capacity—500 sq. ft. per gal. per coat.

Minwax Finishes for Wood Floors

(67) Introduction—The data here presented applies particularly to wood floors subject to hard service as in schools, factories, etc. Where maple floors are laid, a light natural color is always desirable; with oak and pine floors, there is a growing tendency to use stain effects particularly for school floors. For data on Minwax Finishes in stain colors and the use of our method on residential work and as an architectural finish, see our catalogue under the Paint Section as listed in the Manufacturers' Index.

School Room, Huntington Park High School, Los Angeles, Calif.
Treated with Minwax Flat Finish

(68) Minwax Flat Finish

Minwax Flat Finish is a combination of mineral waxes, oils and gums. It is a clear non-viscous liquid and is applied with a brush or mop. It penetrates quickly into the surface and cures, depositing a tough mineral wax or gum that completely seals the surface. This wax when cured, being mineral in character, is highly resistant to the alkalies in soaps and cleaning compounds and its sealing and waterproofing value is so great that it will practically eliminate the necessity for these soaps and compounds and permit the floors to be cleaned by mopping them with clear water.

Minwax Flat Finish is particularly valuable where service conditions require the use of a dust laying oil; for it prevents the retained dust from being ground into the surface. When these floors are cleaned the labor will be cut in half and the surface can be brought to its natural clear light color.

Note: Minwax Flat Finish is made in natural (No. 9) and in stain colors for residential flooring and wood work in all kinds of wood. No. 9 (Natural) only is recommended for maple.

Over a long period of years Minwax Flat Finish has delivered outstanding service in:

Schools	Factory buildings
Stores	Railroad stations
Hospitals	Office buildings
Dance halls	Churches, etc.

(69) Specifications—***Floors***—Apply 2 thorough saturating coats of Minwax Flat Finish No. 9 in accordance with above directions, using special care to remove all surplus after each coat. Close off the floors and protect them against traffic for at least 3 days to permit perfect curing of the materials. Then cover the floor with paper or clean sawdust until ready for final occupancy.

Note: The stain colors are not recommended for maple floors.

(70) Minwax Penetrating Finish

Will penetrate into the heart of or through 1-in. flooring, sealing and filling the surface and protecting the whole body of the wood, will retard dry rot, warping, swelling, etc. Curing to a tough gum, it binds the surface fibers with tough wear-resisting material. It has given special service on: Floors laid on fill; textile mill floors; outside dance floors; porch floors; schools; industrial buildings; stores, etc.

(71) Specifications—Apply 1 thorough even coat of Minwax Penetrating Finish with a brush using 1 gal. for each 350 sq. ft. working it well into the wood. Wipe up the surface thoroughly with clean cloths in not less than 12 nor more than 24 hours after application to remove any excess material. Close off the floor from traffic for from 1 week to 10 days. Before putting the floors in service, wash them down with a strong soap compound to remove dirt and excess material.

(72) Representatives

At the time of going to press there are established Minwax representatives in the following cities. For address refer to local telephone directory.

Albany, N. Y.	Denver, Colo.	Portland, Ore.
Atlanta, Ga.	Detroit, Mich.	Richmond, Va.
Baltimore, Md.	Jacksonville, Fla.	San Francisco, Cal.
Boston, Mass.	Los Angeles, Cal.	Salt Lake City, Utah
Buffalo, N. Y.	Miami, Fla.	Seattle, Wash.
Charlotte, N. C.	Milwaukee, Wis.	Shreveport, La.
Cincinnati, Ohio	Minneapolis, Minn.	St. Louis, Mo.
Cleveland, Ohio	Nashville, Tenn.	Tampa, Fla.
Columbus, Ohio	Philadelphia, Pa.	Wilmington, Del.
	Pittsburgh, Pa.	

Montreal, Toronto and Vancouver in Canada

DR. R. CONSTANTIAN, President
FREDERICK S. CONDIT, Vice President

THE OBELISK WATERPROOFING COMPANY

The Heat Method

TELEPHONE
AShland 4-2541, 2542

1 Madison Avenue
NEW YORK, N. Y.

BOSTON OFFICE: 950 Park Square Building—Telephone, Hancock 0033
DETROIT OFFICE: 439 Penobscot Building—Telephone, Randolph 5500

Services

Exterior Surfaces of Stone, Brick and Stucco Buildings, above grade, TREATED with the CAFFALL PROCESS, the Heat Method.

Business, Residential and Monumental Buildings and Churches Restored, Dampproofed and Preserved; Exteriors of Delicate Marble Preserved from Weather Disintegration; Monuments Restored and Preserved.

Guarantee

Work done under contract with a 10-year guarantee, or a cost-plus-percentage basis without guarantee.

Process

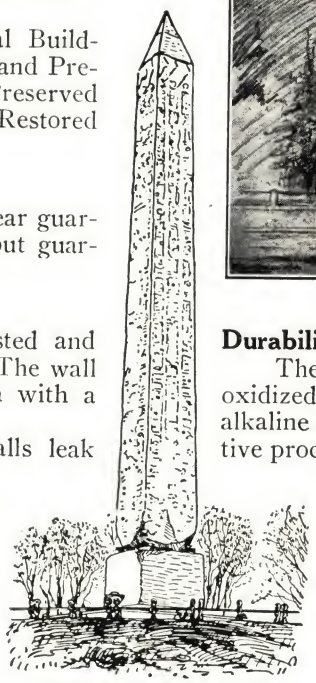
New Structures—The surface is tested and structural defects, if any, are made good. The wall is then impregnated to considerable depth with a melted wax compound forced in by heat.

Old Structures—Where masonry walls leak but material disintegration has not occurred all joints are tested and made sound where necessary, and the entire surface, including joints, treated as above.

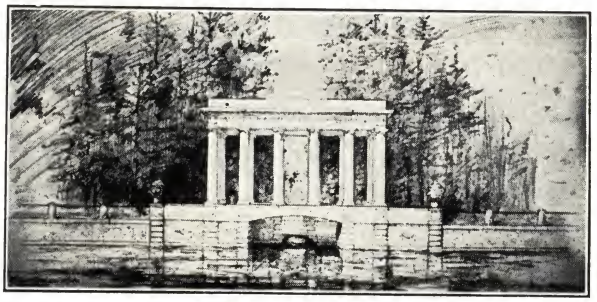
This company makes a specialty of repairing masonry buildings which have been damaged by the weather or through vibration or other causes. Many walls which are sound upon casual inspection prove to have been seriously affected.

Where the surface has disintegrated from weather attack, it is restored to sound condition, joints are repointed, and the entire surface treated as above. The treatment leaves the appearance unchanged, and one treatment will last for the life of the building.

It will be understood that application of heat to buildings, particularly to fine marble and granite, requires expert skill. Heat dries out the surface and forces penetration of preservative material. On cooling, the wax congeals and becomes an integral part of the material at and below the surface.



Obelisk or Cleopatra's Needle
Restored and preserved by Caffall Process, the heat method, in 1885



Plymouth Rock
Treated 1921

Durability

The principal components can not be easily oxidized and are insoluble in water, acidulated or alkaline solution, or gases. This is the only preservative process having a successful history covering any considerable period. Buildings treated more than fifty years ago are still dry.

Cost

Cost can be ascertained on application to the company. It is determined by the following elements:

Character of material to be treated.
Area requiring treatment.
Character of surface, whether plain or ornamental.
Condition, whether newly erected, old, or requiring renovation.
Location of building or monument.

St. Paul's Chapel, Broadway and Vesey Street, New York, N. Y.
Restored and preserved in 1930

Walker-Lispenard Telephone Exchange of the New York Telephone Co., New York, N. Y.

ESTABLISHED 1902

MITCHELL-RAND DAMPPROOFING CORP.

SUBSIDIARY OF MITCHELL-RAND MFG. CO.

Manufacturers of Dampproofing Compounds—Dampproofing Contractors

TELEPHONE
Cortlandt 7-9264

51 Murray Street, NEW YORK, N. Y.

FACTORY AND LABORATORY: JERSEY CITY, N. J.

Products

Spandrel Beam Waterproofing Cloth (Rubberseal Cloth).
Integral Waterproofing Liquid.
Furring Compound (Dampproof Paint).
Semi-Mastic Dampproofing.
Mastic Dampproofing.
Stone Backing Compound.
Integral Double Strength Waterpproofing Paste.
Colorless Waterproofing.
Brick and Cement Coating in Colors.
Superior Cement Colors.

M-R Protective Coatings

Sogg Waterproof Paint
Concrete Floor Wax.
Anti-Freeze Liquid.
Cement Accelerator and Hardener.
Caulking Cement.
Roofing Cement.
Emulsified Asphalt Coatings.
Fibre Roof Coatings.
Black Asphalt Paints.
Expansion Joint Asphalt.
Integral Waterproofing Paste.
Paints for all exterior, interior and general industrial uses.

All Materials Used by Our Contracting Department are Made in Our Own Factory

Rubberseal Cloth

This is a special cotton fabric treated with a compound manufactured only by the Mitchell-Rand factory.

This compound, which remains flexible at 5°F. below zero and stands temperatures as high as 180°F. without losing physical strength is unique in its characteristics.

It adheres to metals without requiring pressure (including aluminum). Dry wood, glass—in fact any hard substance will form a perfect surface for Rubberseal cloth application.

It is proof against acids, alkalis and water.

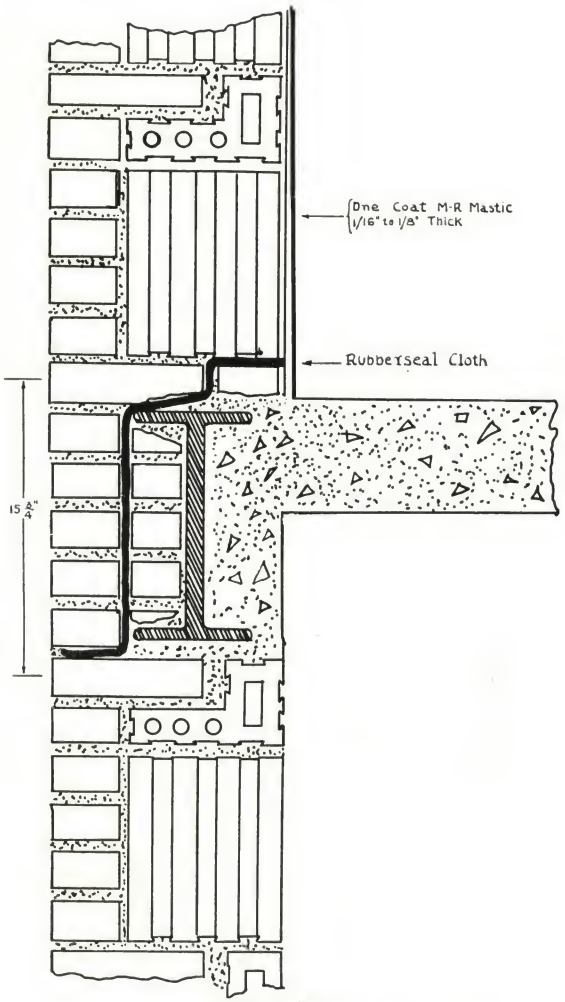
If a nail or other sharp object punctures it, it starts self-healing immediately.

Used extensively for other than dampproofing work, such as wrapping for steam, brine, and gas pipes, above and below ground, providing both insulation and protective value.

Wrapped about electrical lines under ground it protects conduit casings, etc., against electrolytic action of soils.

Drawing No. 1 herewith illustrates one very definitely successful form of dampproofing procedure employing Rubberseal Cloth to protect the spandrel beam.

Other details are available and will be sent to responsible parties upon application in writing.



Drawing No. 1
Write for details showing other systems of dampproofing.

Installations

The following structures have been dampproofed as per Mitchell-Rand specifications and with Mitchell-Rand materials:

Bank of the Manhattan Co. Building, 40 Wall Street, New York, N. Y.
Standard Oil Building, 26 Broadway, New York, N. Y.
Bank of America Building, 44 Wall Street, New York, N. Y.
American Surety Co. Building, 100 Broadway, New York, N. Y.
Church of the Heavenly Rest, 90th Street and 5th Avenue, New York, N. Y.
The News Building, East 42nd Street, New York, N. Y.
Erie Trust Co. Building, Erie, Pa.
Firemen's Insurance Building, Newark, N. J.
Breakers Hotel, Palm Beach, Fla.
Sage & Allen Building, Hartford, Conn.
Magnolia Oil Building, Dallas, Tex.
State Capitol Building, Lincoln, Neb.
Allerton House, Cleveland, Ohio.
Allerton House, Chicago, Ill.
Radcliffe College, Cambridge, Mass.
Haddon Hall Hotel, Atlantic City, N. J.
St. Charles Hotel, Atlantic City, N. J.
State Capitol, Charleston, W. Va.

Mastic Dampproofing

The *amount* of material to be used in a given area is important when specifying the use of mastic. It is our practice to indicate the *number* of 50-gallon barrels we guarantee to use on any job.

Architects and builders would do well to insist that the contractor apply mastic no less than 1/16 in. thick, nor more than ⅛ in. Any tendency to use less than the above thickness usually results in disaster.

Specification for Mastic Dampproofing

The inner surfaces of all exterior walls to be dampproofed, excepting the basement. All surfaces shall be dry and free from dirt and foreign material. All vertical and horizontal mortar joints are to be pointed up by the mason contractor to the satisfaction of the dampproofing contractor. The mastic is to be applied with a trowel, 1/16 to ⅛ in. thick and shall be returned on the reveals of the openings in and around all chases, recesses and cutouts.

The mastic shall be applied in chases and cutouts in which pipes are to be run before such pipes are installed and approved; and the dampproofing contractor shall leave his work whole and in such condition as will insure the best results.

Bank of Manhattan Building, New York, N. Y.
70 floors kept dry by Mitchell-Rand dampproofing

Sogg

Gilsonite, the finest asphalt mined, combined with oxidizing oils at extremely high temperatures under new chemical principles, provides a third substance which we have named "Sogg."

Sogg is a perfect weatherproofing paint because it possesses all the toughness, wearing quality, and long life usually found in ordinary linseed oil paints, plus the ruggedness and waterproofing characteristic of fine asphalt.

It adheres to all metals, concrete, wood and paper surfaces.

It is manufactured in colors as well as black.

Combined with aluminum powder it provides what Government experts say is a 100% waterproof paint.

It is also furnished in consistencies suitable for roofing application, for troweling or caulking.

Special quotation for quantity users.

SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

61 Broadway, NEW YORK, N. Y.

BRANCH OFFICES

BOSTON, MASS. CHICAGO, ILL. CINCINNATI, OHIO CLEVELAND, OHIO DETROIT, MICH. INDIANAPOLIS, IND.
KANSAS CITY, MO. PHILADELPHIA, PA. PITTSBURGH, PA. ST. LOUIS, MO. SYRACUSE, N. Y.

Solvay Calcium Chloride for Curing, Densifying and Accelerating the Setting of Concrete

The Material

A white, dry, flaky chemical which when added to the mixing water accelerates the initial hardening of concrete; at the same time densifies the concrete; making it more waterproof; reduces the freezing point of water, thereby aiding the fresh concrete to resist freezing in low temperatures. Solvay Calcium Chloride is extremely hygroscopic and dissolves almost instantly in water. It can be used with any brand of portland cement.

Tests

Comparative Strength Ratios between Treated and Untreated Concrete—After testing 7500 compression specimens, Prof. Duff A. Abrams, then in charge of Structural Material Research Laboratory of the Lewis Institute, Chicago, Ill., reported that Calcium Chloride produced an increase in concrete strength as indicated in the following table:

Age	2 days	7 days	28 days	3 months	1 year	3 years
Untreated	100%	100%	100%	100%	100%	100%
Treated with 2% to 4% Calcium Chloride...	170%	125%	110%	112%	117%	118%

Accelerating Effect—As shown by tests, concrete gauged with Solvay Calcium Chloride, at the end of 48 hours has the same strength as concrete gauged with plain water has at the end of 7 days.

With Solvay Calcium Chloride, floor finishing is possible within a short time after pouring; concrete can be poured late in afternoon and finished, saving overtime charges.

Results Proven by Authoritative Tests—Thorough and extensive tests made by U. S. Bureau of Standards, American Society for Testing Materials, Portland Cement Association, U. S. Engineers, Lewis Institute and our own engineers have definitely established that Calcium Chloride is beneficial to concrete.

Advantages

Curing—Solvay Calcium Chloride provides a most practicable method of curing structural concrete. Solvay Calcium Chloride incorporated in the mix readily supplies the moisture necessary for proper curing of concrete. Complete hydration can then take place naturally and the concrete is enabled to attain its full strength in much less than the usual time.

Workability—Addition of Solvay Calcium Chloride increases the workability of concrete. Experiments on workability conducted by the New Hampshire State Highway Department indicated that the power required to mix concrete is reduced 20% by the addition of 2% of Calcium Chloride.

Use in Cold Weather—The qualities of quick initial setting, hardening, densifying and reducing of the freezing point of the mixing water make it possible to progress with concrete work in continued cold weather when using Solvay Calcium Chloride.

Waterproofing Qualities—The qualities of hardening, densifying and quick initial setting brought about by Solvay Calcium Chloride make treated concrete more waterproof.

Bankers' Building, Clark and Adams Streets, Chicago, Ill.

One of the many magnificent modern structures in which the use of Solvay Calcium Chloride was specified

Directions for Using Solvay Calcium Chloride

Amount to be used is approximately 2 lbs., dissolved in the mixing water, per bag of cement according to conditions of temperature, location, mix, etc.

Cost and Shipment

Solvay Calcium Chloride, east of the Mississippi, costs, approximately, two cents per pound—in the far West cost is slightly higher.

Solvay Calcium Chloride is shipped in metal drums containing 400 lbs. net and in moistureproof bags containing 100 lbs. net. In bags it must be given same care as cement. Stock is carried in 100 cities in the United States. Special arrangements for handling carload lots.

Technical Service

The Solvay Process Company maintains a Technical Service Department whose services are gladly rendered without charge to engineers and architects.

Literature

The new comprehensive 32-page booklet, "Solvay Calcium Chloride in Concrete Construction," Architect's Specification Sheet and Report of the Investigating Committee of Architects and Engineers will be sent without charge upon request.

Hoffman-La Roche Building, Nutley, N. J.
C. H. Benjamin, Architect
J. W. Ferguson, Contractor

Other Typical Buildings

Chicago Tribune Building, Chicago, Ill.
Lincoln Safe Deposit Building, New York, N. Y.
Montreal Rail and Water Terminals
Maccabees Building, Detroit, Mich.
Sesqui-Centennial Stadium, Philadelphia, Pa.
Eaton Tower, Detroit, Mich.
Foshay Tower, Minneapolis, Minn.
Santa Fé Grain Tanks, Argentine, Kan.
Civic Opera Building, Chicago, Ill.

Hearst Publication Plant, New York, N. Y.
Turner Construction Company, Contractors

SOMMERS & CO., LTD.

342 Madison Avenue
NEW YORK, N. Y.

PERMANTITE CONCENTRATED LIQUID INTEGRAL WATERPROOFING

A Permanent Integral Waterproofing, Hardener, Accelerator and Antifreeze for Concrete, Cement Mortar and Stucco

What Permantite Does

(1) Permanently waterproofs and hardens concrete, cement mortar and portland cement stucco. Hardens cement floors; used in finish coat.

(2) Materially increases the crushing, tensile and abrasive strength of concretes with which it is mixed.

(3) Quickens the set of concrete and cement mortar.

(4) Lubricates the cement, resulting in quicker work and easier troweling.

(5) Increases the bond of any new cement mixture to all cement or concrete surfaces.

(6) Reduces the freezing point of concrete and cement mortar to the minimum. A 4-in-1 material; *waterproofer, hardener, accelerator* and *antifreeze.*

PERMANTITE
TRADE-MARK

Empire State Building, New York, N. Y.
SHREVE, LAMB & HARMON, Architects
STARRETT BROS. & EKEN, INC., Builders

How Permantite Is Used

An outstanding merit of Permantite is the ease with which it is used. No matter what the mix or the variance of conditions under which the finished concrete is to be used, the directions are the same. Nothing is left to guesswork—no need to figure complicated formulæ. It is impossible to use Permantite other than correctly. Permantite is used as follows:

One quart of Permantite to each bag of cement poured directly into the mixer *after* the gauging water has been added.

Notes

Permantite will *not* work with Lime or gypsum plaster.

Permantite should not be added until the water has been added to the mix.

Permantite should be used only with portland cement stucco—it will not work with prepared or ready-mixed stucco.

Under no circumstances should Permantite be used with dry cement or sand, or any dry ingredient.

New York Central Office Building, New York, N. Y.
WARREN & WETMORE, Architects
JAMES STEWART & CO., Builders

Barclay-Vesey Telephone Building, New York, N. Y.
MCKENZIE, VOORHEES & GMELIN, Architects
MARC EIDLITZ & SON, INC., Builders

Standard Oil Building, New York, N. Y.
CARRERE & HASTINGS; SHREVE, LAMB & BLAKE, Architects
CHAS. T. WILLS, INC., Builders

Other Sommers Products

Dampproofing Paints; Calking Cements; Cement Colors; Stone Backing Paint; Semimastic and Mastic Dampproofings, Liquid and Plastic Asbestos Roof Coating; Floor Hardener and Coating; Transparent Dampproofing; Masonry Coating; Waterproofing Fabric; Technical Paints and Varnishes.

A Few Permantite Jobs

BUILDING	ARCHITECT
National City Bank, New York	McKim, Mead & White
Architects Building Addition, New York	Ewing & Allen
New York Stock Exchange, New York	Trowbridge & Livingston
Connecticut General Life Insurance Building, Hartford	James Gamble Rogers
Connecticut Mutual Life Insurance Building, Hartford	Benjamin W. Morris
Department of Commerce, Washington	York & Sawyer

L. SONNEBORN SONS, INC.

Floor Treatments, Waterproofing Materials, Decorative and Technical Paints

GENERAL OFFICES
88 Lexington Avenue
NEW YORK, N. Y.

BRANCH OFFICES
BALTIMORE CHICAGO PHILADELPHIA PITTSBURGH LOS ANGELES BOSTON
RICHMOND SAN FRANCISCO DETROIT MINNEAPOLIS SEATTLE

FACTORY: BELLEVILLE, N. J.
SOUTHWESTERN DISTRIBUTORS: Sonneborn Bros., DALLAS, TEX.

Products

"LAPIDOLITH," the Liquid Chemical Hardener and Dustproofer for concrete and terrazzo floors.

"SONNEBORN'S CEMENT FILLER and DUSTPROOFER" for cement floors (transparent and in colors).

"HYDROCIDE" WATERPROOFING PRODUCTS for interior and exterior surfaces.

"LIGNOPHOL," a Preservative for wood floors.

"CEMCOAT," an Improved Mill White.

"CEMCOAT" FLOOR ENAMEL.

"STIP-EL-ART," for interior stippling or texturing.

Also Amalie Structural Steel Paints, Galvacote, a coating for galvanized iron; Amalie Pipe Enamel; Amalie Radiator Enamel; Amalie Stack and Boiler Paints; Amalie P & D House Paints; Enamelife.

Hardening, Dustproofing and Waterproofing Old or New Concrete Floors

"Lapidolith"—A liquid LAPIDOLITH TRADE MARK chemical which penetrates concrete floors, rendering them hard, dustproof, wearproof and watertight. When applied to old concrete floors, "Lapidolith" will prevent further dusting and disintegration. It does not change the color of concrete.

An Investigation of the Action of "Lapidolith" on Concrete—Following is an extract from the official report of Prof. R. J. Colony of Columbia University, New York, as the result of an examination by him, under the microscope, of treated and untreated concrete:

"The external application of 'Lapidolith' to concrete surfaces results in (a) the formation of an optically isotropic but crystalline substance, derived by a reaction between components of the 'Lapidolith' and the cement matrix of the concrete which (b) has a tendency to fill in voids and cavities and act as a binding agent, thus rendering the surface smoother and more uniform."

No. 1. Untreated Concrete

No. 2. Lapidolized Concrete

Microphotographs of Specimens of Concrete
Magnified 50 diameters

No. 1. Note large numerous voids (black spots) and roughness of surface.

No. 2. Note roughness is reduced and voids filled with network of newly formed hard crystalline substance

Application—"Lapidolith" is mixed with water and flushed on the floor as per detailed directions to be furnished.

Special Service Work—We also contract to apply "Lapidolith" with our own men under the supervision of a service engineer on areas of 20,000 sq. ft. or over at a substantial saving to the owner in material and labor.

Specification for Concrete Floor—Harden and dustproof the following concrete floor (.....) or as noted on the drawings with 3 applications of "Lapidolith," manufactured by L. SONNEBORN SONS, INC., New York, N. Y., and applied as per their directions.

Filling and Dustproofing, also Oilproofing, Concrete Floors Subject to Light Wear

"Sonneborn's Cement Filler and Dustproofer," for concrete floors where there is no excessive wear. Furnished either transparent or in a number of attractive shades. Covering capacity per gallon, 1 coat, is 350 sq. ft.; 2 coats, 200 sq. ft.

Specification—Fill and dustproof the following cement floors (.....) with 2 coats of "Sonneborn's Cement Filler and Dustproofer" manufactured by L. SONNEBORN SONS, INC., New York, N. Y., applied as per manufacturer's directions.

"Hydrocide" Waterproofing Products

"Hydrocide" No. 633 (Also Hydrocide Mastic and Semi-mastic)—Plaster bond for dampproofing the inner surfaces of outside walls above foundations.

Ready for use, applied cold with a brush. Saves furring and lathing expense. Should not be applied to smooth concrete surfaces which are to be plastered unless walls are sufficiently roughened. Covering capacity per gallon of Hydrocide No. 633, 1 coat, is 65 to 100 sq. ft.

"Hydrocide" Mastic and Semi-mastic (Also Hydrocide No. 648)—For waterproofing outer surface of foundation walls and footings.

Ready for use, applied cold. Covering capacity: Mastic, 30 to 40 lb. per 100 sq. ft. troweled on. Semi-mastic, 30 to 40 sq. ft. per gallon, brushed on in one heavy coat.

"Hydrocide" No. 611—For the protection of unexposed surfaces of limestone, caen stone, marble and other fine stones, from stain caused by absorption or communicated by surrounding masonry. Covering capacity from 250 to 350 sq. ft. per gal.

"Hydrocide" Integral Waterproofing (Powder, Paste, and Liquid)—For waterproofing mass concrete, concrete walls, floors, cement stucco and mortars, etc. Mix 2 lb. of powder with each bag of portland cement, then add the sand and stone mixture. Use 1½ qt. of a mixture of equal parts of paste and water for each bag of cement. Use 1 gal. of Liquid for each 10 gal. water, or 1½ gal. for each cubic yard of concrete, 1 gal. for each 100 sq. ft. of 1-in. floor topping.

Waterproofing Exterior Walls Above Grade without Changing Appearance of Walls

"Hydrocide Colorless" contains no wax, paraffin or any substance that will disfigure the surface.

Grade "A" for light colored surfaces, such as plain concrete and stucco, etc.; "B" for red and buff brick, colored concrete and stucco; "D" for very porous surfaces, such as limestone, concrete cast stone, etc. that are of light color.

Preservative and Finish for New and Old Wood Floors, and for Woodwork

LIGNOPHOL FOR WOODEN FLOORS
TRADE-MARK

"Lignophol Penetrating Finish"—Lignophol is a preservative composed of natural wood gums and oils. It penetrates to a considerable depth below the surface of a wood floor, filling the voids in and between the cells and fibers. Prevents splintering, cracking, warping and dry and wet rot.

"Lignophol" also acts as a dampproofer and dustproofer. Contains a powerful fungicide which checks the growth of fungus and mold. It prevents the disintegration of the wood fibers. It makes floors resilient and more resistant to heavy traffic and wear.

Specifications—After scraping, all wood flooring shall be given 1 application of Lignophol Penetrating Finish (color to be selected) as per manufacturer's directions. (Specify 2 coats for floors subjected to heavy wear.)

Note: Application by *dipping* is recommended as the most efficient treatment for thorough impregnation.

"Lignophol Wax Finish"—For residence floors, dance floors, wood trim, and wherever a medium or high gloss in waxed effect is desired.

Specifications—After scraping, all wood flooring shall be given 1 application of Lignophol Wax Finish (color to be selected) and surface to be polished after 6 to 8 hours following application, for medium gloss. Wherever high gloss is required, let about 24 hours elapse after polishing, then apply 1 coat Sonneborn's Paste Wax and polish in about 20 minutes.

Lignophol for Woodwork—Interior and exterior woodwork can be efficiently protected and artistically finished with Lignophol Penetrating or Wax Finish.

Covering Capacity and Colors—The spreading capacity of Lignophol will vary with the wood and the surface porosity. Close-grained woods, like maple, require less material than porous, open-grained or soft woods like pine. In estimating, figure that a gallon of Lignophol (Penetrating or Wax Finish) covers about 400 to 500 sq. ft. over hard wood; 350 to 450 sq. ft. over soft wood (one coat).

Furnished in 4 colors: Natural, Light Brown, Medium Brown, Dark Brown.

Write for complete specifications and details.

"Cemcoat," a Sanitary, Washable, Light-reflecting Enamel Paint for Interior Walls and Ceilings

Cemcoat
TRADE-MARK

A white enamel paint which will stay as white as the most expensive enamels. Very opaque, 2 coats will cover as well as 3 coats of ordinary lead and oil paint. Is not poisonous. Is sanitary, can be washed with soap and water or even with a hose without affecting the surface. Will not peel, crack or blister if properly applied to a normal surface.

For Interior Walls—Can be used on concrete or any other masonry materials, wood or metal. A coat of "Cemcoat" flat undercoat followed by a coat of "Cemcoat" finish will give best results. For very porous surfaces, 1 coat *each* of Amalie Gypsum Size, "Cemcoat" Undercoating and "Cemcoat" Finish.

White Flat "Cemcoat" Finish—Scientific laboratory tests have proven that it gives the unusual reflection factor of 86%, contrary to long established theory that gloss paint has the greatest reflective properties.

Eggshell and Gloss "Cemcoat" Finish—Eggshell is recommended for offices, schoolrooms, etc.; Gloss for conditions involving moisture, steam and other cases requiring this type of finish.

Colors—Made in all standard colors.

Covering Capacity—Approximate number of square feet per gallon, per coat:

	First Coat	Second Coat
Concrete	250	300
Brick	250	300
Plaster	300	350
Wood	400	450
Metal	400–500	500–600

Exterior "Cemcoat" for Exterior Walls

For decorating and dampproofing exterior walls above grade. Comes in 12 attractive colors, flat or gloss finish.

Covering Capacity—On concrete, brick, stone and stucco, approximately 175 sq. ft. per gallon for 2 coats; on wood and metal 250 sq. ft. per gallon for 2 coats.

"Cemcoat" Floor Enamel for Cement Floors

Exceptionally elastic and durable; will successfully stand up where ordinary floor enamels would fail. Dries in 24 hours to a glossy washable film. Eight attractive colors.

Covering Capacity—Will cover approximately 200 sq. ft. per gal., 2 coats.

Stip-El-Art

A plastic oil base wall finish for stippling or texturing, easy and inexpensive to apply.

Stip-El-Art offers the painter and decorator the widest range for executing individual textured colorful effects. Ready for use, requires no thinning or mixing.

It is adapted for any style of building, domestic, commercial or civic. Solves the most complex decorative problems.

Covering Capacity—Will cover 60 to 100 sq. ft. per gal., 1 coat.

Further Information

The following printed matter sent on request:

"Specification Data" portfolio arranged according to A. I. A. classification. Fits standard correspondence files, comprises floor treatments, dampproofing, waterproofing, and painting.

Booklets: Various booklets and literature are available on the various products mentioned. Just specify in writing the product in which you are interested and full information will be forwarded.

Technical Service

The services of our experienced technical staff are available for any special problem, and you are cordially invited to consult with us.

THE SULLIVAN COMPANY

Manufacturers of Cement Mixing Compounds and Technical Products

GENERAL SALES OFFICE
MEMPHIS, TENN.

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BOISE, IDAHO, 501 So. 8th Street
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NEW YORK, N. Y., 30 Church Street
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DISTRIBUTORS IN ALL PRINCIPAL CITIES

Sulco Products

Konset, an Integral Cement Mixing Compound—Colorless or in colors, when mixed with concrete, provides five desirable conditions:

(1) Accelerates the initial and final set and increases the early tensile strength.
(2) Gives greater plasticity and workability.
(3) Increases density, making it hard and waterproof.
(4) Increases freezing resistance.
(5) Colors where desired.

Konset, in colored paste or powder form, produces any desired color effect in cement mixtures, such as floors, walls, mortar joints, cement stucco, mortar and cement plaster. Also used for making tile and brick, portland cement paints, etc. Patches and waterproofs against pressure and colors any concrete or masonry.

By its use in colorless liquid or powder, or colored paste or powder form you save time, labor and money and at the same time obtain a surface hard, waterproof and dustproof. This product has been used in some of the largest projects throughout the world and is a lasting benefit to architects, engineers, contractors and owners.

Aztex, Scientific Chemical Cement and Plaster Stains—Applied to any porous portland cement surface, plaster, stucco, artificial or natural stone floors, walls, walks, etc. Renders mottled or duo-tone effects. Standard colors are Brown and Green.

Sealcote—A colorless water-repelling liquid or invisible coating that seals walls and waterproofs concrete, brick, stone, plaster, stucco, canvas, etc. Prevents efflorescence and will not discolor any surface. Can also be made in colors. Protects against dampness and lengthens the life of the building.

Kemi-Kal, Cement Surface Hardener—In liquid or crystal form. For hardening and dustproofing cement floors, walks and roads after they are laid. It also is used for stucco, plaster, stone, marble, terrazzo, etc.

Waterproofing, Liquid, Powder and Concentrated Paste—Liquid for mass concrete to waterproof portland cement; powder for mixing with dry cement; paste for adding to gauging water to be used for mixing concrete.

Sulco Plaster Bond, Damp-proofing and Stone Backing—A tenacious, bituminous, elastic preparation for inside surfaces of outside walls. Eliminates furring and lathing. Also for coating concrete floor slabs and wood sleepers. Prevents discoloration and dampness and renders the inside of walls verminproof and stainproof. For damp-proofing foundations, cellars, etc. Not to be used on ceilings or between concrete and portland cement mortar. Damp-proofing is made in three grades, regular, No. 2 and No. 3. No. 2 is for troweling, No. 3 is a hot process and is self-healing.

Fissurseal—For grouting and blocking fissures, etc., making water shutoffs in mines and underground projects, solidifying loose shale and cavey formations.

Sulco Mortar, Plaster and Stucco Colors—Sulco Paste and Powder Colors possess the characteristics of durability and permanency.

Sulco Calking and Glazing Compound—For bedding, glazing and calking skylights, conservatories, hothouses, sheet metal frames, window frames, wood sashes, roofs, walls, concrete copings, swimming pools, tile floors, seams in boats, etc. Made in knife and gun grades, natural or all colors.

Konseal—A sanitary liquid filler for cement and concrete surfaces, floors, walls, etc. Made in clear and all colors.

Sulco Powder Paint—Waterproof semi-washable cold water paint. Can be used on almost any surface, interior or exterior. Can also be used with oil straight or in emulsion. Applicable to wet surfaces. Made in all colors; also in paste.

Iron-Cote, a Metallic Hardener—For concrete floors in factories, garages, loading platforms, piers, packing houses, etc. It is composed of finely ground iron and other materials. Made in all colors. Also Dymond non-slip carborundum base.

Sulco Wax, Liquid or Paste—For polishing and treating old and new cement and wood floors; also recommended for use on Konset and Aztex interior floor treatments.

Sulco Acoustical Plaster—Made in colors. For any acoustical treatment desired.

Sulco Acoustical Paint—Recommended for use over any Acoustical Plaster, etc.

Sulco Flameproofing—A wood preserver and fire-retardant for canvas, wood, shingles and other surfaces.

Cedarize—For mothproofing, preserving and decorating clothes closets.

Kant-Leak—For waterproofing and covering concrete roof decks, flashing and other roofing surfaces. A plastic, adhesive compound made from asbestos and slow-drying oils. Applied in liquid with a brush or plastic with a trowel. All colors.

Ironized Waterproofing—A product manufactured especially for waterproofing masonry surfaces against dampness or hydrostatic pressure by the iron method. An ideal product for waterproofing foundations, basements, tunnels, pits, understructures, etc. Also renders any surface oilproof and frostproof.

Woodseal—Preserves new or old wood floors, composition floors, cork, rubber, linoleum and cement; prevents warping, wear, rotting, splintering or dusting.

Sulco Slip-proof Grains—An abrasive material in loose form for impregnating cement or composition floors or stair treads to prevent slipping.

Bux-Skin—A liquid, clear and in all colors for preserving and rendering awnings, tents, tarpaulins, curtains, covers, fisherman's riggings, hatch covers, canvas and cotton-duck goods proof against mildew and water.

Art-Cote—Plastic paint for rough plastered wall effects.

Wall Size, Glaze and Star Dust—For scintillating color charm.

Lime Mortar Accelerator—A special product made for use with mortars where hydrated lime is used.

Acitite and Sulsilo—Acidproof Cements.

E-Z Patch—Quick-hardening repair for concrete or stucco.

Wood Cement—A remarkable puttylike composition which hardens under exposure. For all wood repairs.

Sulco Weed Exterminator—Kills roots as well as tops.

Komix—Concrete lubricator. Makes all cement mixtures plastic and easier to work. Holds the batch in suspension. Increases workability. Made in black liquid, white powder and colorless paste.

Kleenite—A powder for cleaning any surface.

Other Sulco Products

Sulco shingle stains; fireproof and cold water paints; X-It, for termites; Gardex; Plastic Marble; acoustical compounds; aluminum paint; enamels; technical paints, etc.

We make a specialty of manufacturing specification goods, so in purchasing Sulco Products you are buying high class products 100% pure.

Catalogue

Write for our catalogue "Life Preservers for Buildings and Equipment," including representative users. Inquiries are solicited on any waterproofing or technical problem.

SUPER CONCRETE EMULSIONS, LTD.

3710 South Alameda Street
LOS ANGELES, CALIF.

1716 Youghiogheny Ave.
PITTSBURGH, PA.

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PORTLAND, ORE., Western Suconem Co., 308 Stock Exchange Bldg.
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AND OTHER PRINCIPAL CITIES

Suconem for Better Concrete

SUCONEM
for Better Concrete

Suconem is an emulsion of chemicals and oils resembling in consistency a thick grease. The emulsified material is made up of such finely divided particles that, when added to a batch of concrete, it immediately and completely disperses itself throughout the mixture. The material so thoroughly lubricates the various particles making up the mixture that the amount of water required for making a workable batch is much less than would be otherwise required.

Grades—Suconem is marketed in two grades—Red Label and Yellow Label.

Red Label Suconem—Recommended for use when all of the following beneficial effects are desired: greater strength and density, watertightness, plasticity, workability; prevention of segregation, laitance and efflorescence. These may be secured by adding 1 gal. of Red Label Suconem for every 5 sacks of cement.

Yellow Label Suconem—Recommended for use when only plasticity and prevention of segregation are the beneficial effects desired. Yellow Label Suconem is lower in price than the Red Label and 1 gal. is used to every 10 sacks of cement.

Increased Plasticity and Workability with Less Water—Suconem, when added to a concrete mixture, allows a reduction in the amount of mixing water and at the same time effects a pronounced improvement in both workability and plasticity. Due to extreme differences in concrete aggregates, the reduction in the amount of water needed is variable; however, for ordinary materials the reduction will be from 10% to 30%. The addition of Suconem to a dry concrete mix will increase the slump from 80% to 100%.

Suconem added to concrete absolutely prevents segregation of aggregates.

Perfect Casting—The plasticity and perfect workability that Suconem gives to a concrete mixture causes it to so fill the forms that they are perfectly reproduced. (See illustration.) This feature is of the highest importance where architectural details are to be cast in concrete, and where waste moulding and other intricate formwork is used. It also eliminates the tendency toward water pockets. The higher early strengths also make the likelihood of damage to the casting when the forms are removed considerably less.

Reduction in Labor—The addition of Suconem to a concrete so increases its workability and plasticity that the amount of labor required for working and placing is substantially reduced. Especially is this true of concrete made of harsh and unworkable aggregates.

Improved Watertightness and Weather Resistance—The use of Suconem makes a concrete highly resistant to the passage of water and is therefore an ideal material for use in exterior walls, tanks, reservoirs, etc. and in ornamentation which is to be placed monolithically with the concrete.

Increased Early Strength—It has been completely demonstrated that for any given set of conditions as to aggregates, mixing, etc., the strength of a concrete will vary inversely with the amount of mixing water used per unit of cement. Due to the marked reduction in mixing water required to secure a workable mixture when Suconem is used, the strength of the resulting concrete will be greatly increased.

Suconem also has a stimulating action on the hardening of the concrete which results in the concrete acquiring double its 1-day strength over that of plain concrete and acquiring its 28-day strength at the end of 3 days or less. Increases in the 28-day strength by from 25% to 35% are not at all unusual.

Harder Surface—A smoother and harder surface is given to concrete when Suconem is used, due to its greater plasticity and increased strength. Sealing of the surface by the Suconem prevents evaporation with consequent better curing and reduction in crazing, hair cracking and dusting.

Elimination of Laitance and Efflorescence—The total lack of excess mixing water permitted by the use of Suconem prevents the finer particles of cement being carried to the surface and there hardening into a chalklike material called laitance. This laitance which forms with ordinary mixes, if not removed after each pour, causes a permanent lack of bond between pours and thus weakens the structure.

Reduced Form Leakage—One of the direct results ensuing from the total elimination of excess water from Suconem mixed concrete is the elimination of form leakage. With ordinary concrete it is absolutely necessary that all forms be free from small holes and cracks, otherwise the surplus water holding some of the cement in suspension will be lost. This, of course, saves considerable expense.

Quicker Stripping—The high early strength secured with Suconem can be utilized to advantage by the much earlier removal of forms. In most cases this will result in one or more extra re-uses of the form lumber with a resulting saving in cost which will in itself more than offset the cost of the Suconem used.

Better Curing—The use of Suconem in concrete retards the escape of the moisture from freshly placed concrete and thus renders it less susceptible to the harmful effects of premature drying. This characteristic, together with shortened curing time due to accelerated hardening, improve curing conditions materially.

Shipment of Suconem

Suconem is usually shipped in 30-gal. drums with a 15-inch diameter top opening. These drums when full weigh approximately 360 lbs. The large top opening allows Suconem to be readily removed with a dipper of a convenient size.

Direction for Using Suconem

Suconem is added directly to the concrete mixture, either directly into the mixer or to the aggregate in the measuring box or charging skip. It is preferable that contact with the dry cement be avoided if convenient because of the tendency of the dry cement to absorb the emulsion which will delay the mixing slightly. Merely get it into the mixer at the same time as the other ingredients and the mixing operation will spread it throughout the batch and allow it to do its work.

Red Label Suconem is added to the batch on the basis of 4/5 to each sack of cement and Yellow Label Suconem on the basis of 2/5 qt. to each sack of cement.

Agents for Crosby Automatic Meters for controlling water content of concrete.

THE TEXAS COMPANY

Manufacturers of Texaco El Glykol—A Dampproofing Liquid
That Protects By Penetration or Coating

135 East 42nd Street

NEW YORK, N. Y.

Waterproof Compound

Texaco El Glykol meets the demand for a transparent, waterproof coating or penetrative material for outdoor surfaces subject to deterioration by weather, where it is necessary:

To prevent uneven weather stains on stone.

To prevent surface disintegration of stucco and concrete.

To render weather-tight, certain types of old buildings.

To prevent efflorescence in brick and stone where the mortar is in good condition but too porous.

To provide waterproof primer under paint on permeable substances.

Wherever it is necessary to eliminate moisture penetration, or to lessen the results of moisture penetration, the following uses of Texaco El Glykol are indicated:

New brick walls.
Old brick walls after repointing with new mortar.
Stone walls and stone buildings.
Concrete walls.
Cellar dampproofing.
Concrete masonry such as bridges and foundations.
Concrete dams.

Undercoat

Texaco El Glykol will be found efficient as a sizing under paint on interior walls and as a primer under paint on exterior walls. In such cases, these uses are indicated:

(a) On inside walls—over plaster as a dampproof sizing for paint, calcimine or whitewash.

(b) On exterior walls, as a waterproof primer.

Application

Texaco El Glykol is easily applied to any dry surface by any of the methods used to apply common paint—it may be brushed on or sprayed on. Being an *all year* product, it may be applied at any temperature. It is not limited in its use to temperatures above 40° Fahrenheit as are so many products formerly used.

Packages

Texaco El Glykol is sold in the following sized containers and cases:

55-gallon metal drums (non-returnable).
30-gallon metal drums (non-returnable).
15-gallon metal drums (non-returnable).
Case—two 5-gallon lithographed cans.
Case—one 5-gallon lithographed can.
Case—ten 1-gallon lithographed cans.
Case—twelve 1-quart lithographed cans.

Further Information

For further information regarding Texaco El Glykol please address: THE TEXAS COMPANY, General Sales Department, 135 East 42nd Street, New York, N. Y.

For Export—Please address: THE TEXAS COMPANY, Export Department, 135 East 42nd Street, New York, N. Y., U. S. A.

A Few Prominent Users of Texaco El Glykol

Johns Hopkins Hospital
Baltimore, Md.

Postal Telegraph-Cable Co.
67 Broad Street
New York, N. Y.

National Biscuit Co.
449 West 14th Street
New York, N. Y.

Y.M.C.A., Central District
55 Hanson Place
Brooklyn, N. Y.

Wm. Kennedy Construction Co.
215 Montague Street
Brooklyn, N. Y.

Williamsburg Savings Bank Building
1 Hanson Place
Brooklyn, N. Y.

Beards Erie Basin, Inc.
Beard and Van Brunt Streets
Brooklyn, N. Y.

Stonybrook School
Stonybrook, L. I., N. Y.

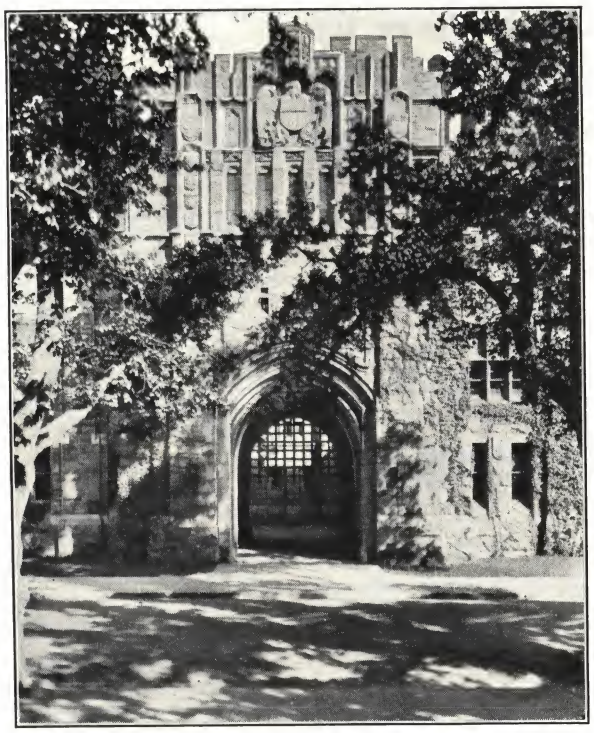
Brooklyn Edison Co.
380 Pearl Street
Brooklyn, N. Y.

Pocomoke City Armory
Pocomoke, Md.
c/o Adjutant General of State

Church of Our Lady of The Most Blessed Sacrament
Elmwood Avenue
East Orange, N. J.

Concourse Plaza Hotel
900 Grand Concourse
New York, N. Y.

East Orange Civic Center
East Orange, N. J.



Entrance to Headquarters Building, U. S. Military Academy, West Point, N. Y.

Queens County Medical Society Building
Queens Boulevard
Forest Hills, L. I., N. Y.

Glen-Gary Shale Brick Co.
Reading, Pa.

Twin Coach Co.
Kent, Ohio

Tuco Products Co.
50 Church Street
New York, N. Y.

Structural Waterproofing Co.
285 Madison Avenue
New York, N. Y.

Port-A-Bowl Corp.
41 E. 42nd Street
New York, N. Y.

N. Y. University
Washington Square and 250 E. 43rd Street
New York, N. Y.

Lincoln School for Nurses
141st St. and Southern Boulevard
Bronx, N. Y.

Fred F. French Co.
42nd Street and Prospect Place
New York, N. Y.

Dugan Brothers
287 Broadway
Brooklyn, N. Y.

Hall's Road House
Northport or Centerport
L. I., N. Y.

The original beauty of this Headquarters Building at West Point has been preserved by El Glykol since 1915. Other buildings at West Point treated with El Glykol are all in excellent state of preservation today. These buildings and the dates of El Glykol application are:

Bachelor Officers' Quarters, 1915.
Cadet Mess Hall, 1927.
Front of Gymnasium, 1926.
Portions of North Cadet Barracks, 1926.
Riding Academy, 1927.
Cadet Chapel, 1923.

Entire structure of Stadium, including painted wooden seats, concrete steps and walls, 1926.

THE TRUSCON LABORATORIES

Integral Waterproofings, Dampproofings, Floor Hardeners

DETROIT, MICH.

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Products

INTEGRAL WATERPROOFINGS for concrete and portland cement mortars.

DAMPPROOFINGS.

CEMENT FLOOR HARDENERS.

ANTI-FREEZE MIXTURES.

For our pages on Paints and Varnishes, see Manufacturers' Index.

TRADE-MARK

Truscon Waterproofing Paste (Integral)

Definition—An integral compound for producing thoroughly waterproof concrete or cement mortar. It is adapted to waterproofing concrete construction of various kinds—foundations, reservoirs, tunnels, dams, cisterns, etc. Also used for waterproofing old brick, concrete and stone structures through the agency of a cement plaster coat into which the waterproofing is introduced. Truscon Waterproofing Paste is also used for producing waterproof cement stucco and cement mortar.

How Used—Truscon Waterproofing Paste is incorporated into the concrete or cement mortar by being added directly to the mix. Since the waterproofing is in paste form, it diffuses readily throughout the mix, providing uniform distribution of the waterproofing.

Advantages—(1) *Water repellent;* kills capillary absorption of moisture into concrete or cement plaster. Since "plugging the pores" of cement is physically impossible, the repellent feature of Truscon Waterproofing Paste is the most practical and scientific method of waterproofing.

(2) *Easy to use*—added directly to the mix from the drum.

(3) *High concentration and freedom from useless filler*—it is all waterproofing—contains no clay, lime or such material.

(4) *Plasticizes concrete*—and minimizes segregation. Concrete containing Truscon Waterproofing Paste requires less water, hence avoids "sloppy" mixes.

(5) *In paste form*—a form most easily mixed with wet concrete or cement mortar batches. This insures even distribution of the waterproofing.

(6) *Inert*—does not react chemically with cement; hence does not lower the strength of the concrete.

(7) *High concentration*—all waterproofing—hence low cost per yard.

(8) *Contains no soluble salts to rust reinforcing steel.*

(9) *Lubricates the mix* by cutting the "skin strength" of water—producing a concrete which "chutes" easily to the forms; produces a more dense and compact concrete. In the case of cement mortar or stucco, "lubrication" makes these materials of creamy consistency and much easier to apply. Avoids mottling of surface of cement stucco.

(10) *Insoluble in water*—hence can not be washed out of the concrete or affected by time or weathering. This is an important point because so many of the waterproofings on the market will dissolve in water.

(11) *Proved by years of use* in the world's most famous structures.

Specifications for Waterproofing Mass Concrete

Estimate 7 lb. of Truscon Waterproofing Paste (Integral) to the cubic yard of concrete. Applicable to concrete foundations, reservoirs, tunnels, cisterns, swimming pools, etc.

Method—Water tightness shall be secured by the addition of Truscon Waterproofing Paste concentrated, added directly to the mix in the skip; proportions as directed below.

Ingredients and Proportions for Concrete—The concrete composing the structure shall consist of 1 part of cement, 2 parts of sand and 4 parts of stone (1:2:4) properly graded in size from coarse to fine.

A measuring cup is furnished with each drum of Truscon Waterproofing Paste. Add one Truscon Measuring Cup per bag of cement to the mix in the skip.

Placing—All concrete shall be placed in one continuous operation, each pouring being properly spaded. In cases where joints are unavoidable, care shall be taken to clean and roughen the old surface, and have it thoroughly wet and slush coated immediately before placing additional concrete.

Specifications for Waterproof Cement Plaster Coat

Estimate 6 lb. of Truscon Waterproofing Paste to the 100 sq. ft. of ¾-in plaster applied to the walls, and 16 lb. of paste to the 100 sq. ft. of 2-in. finish applied to the floor. Applicable to reservoirs, swimming pools, cisterns and similar forms of masonry construction, whether of brick, stone or concrete.

Method—Water-tightness shall be secured by plastering the interior surface of the structure with a continuous coating of portland cement mortar waterproofed with Truscon Waterproofing Paste.

Ingredients and Proportions for Waterproofed Plaster Coat—The mortar composing the plaster coat shall consist of 1 part of cement and 2 parts of clean sand (1:2), free from organic matter and uniformly graded.

Preparation—The Waterproof Cement Mortar shall consist of one (1) part of cement to two (2) parts of sand (1:2) to which Truscon Waterproofing Paste shall be added in the proportion of 1½ Truscon "Measuring Cups" to the bag of cement. Then add gauging water and mix thoroughly.

Preparation of Surface to be Coated—Before plastering the waterproofed cement mortar onto the hardened concrete, brick or masonry, proper precautions should be taken to insure thorough bonding and keying of the plaster coat to the wall.

Application of Coating to Sides—Immediately after applying a slush coat, the waterproofed plaster shall be applied in 2 coats each ⅜ in. thick as per specifications of the manufacturer, the second coat being applied just before the first has reached its final set.

Application of Floor Coating—Floors shall be prepared and treated with equal care as the walls to insure proper bonding of the mortar, and finished with a waterproofed cement mortar to a thickness of 2 in. Special care must be exercised in joining the wall coating to the floor coating, so that there is a continuous waterproof coating over the entire surface.

Pressure—When moisture is seeping through the walls, proper drainage must be provided during the application and setting of the plaster coat, until such time as the plaster coat has set and is capable of resisting pressure of its own adhesive strength.

Truscon Ferritex

Dampproof wash for cement or concrete surfaces.

A pulverized iron compound, made chemically active, which when used as a brush coat over concrete or porous masonry, plugs the pores and acts as a dampproofing.

It is often desirable to specify Ferritex as a dampproofing for the interior of cellar walls or concrete tanks where a black dampproofing compound would not give service and a waterproof cement plaster coat is found too expensive. It is to be noted, however, that where hydrostatic pressure is encountered Ferritex is not recommended. For such severe conditions, the remedy is the use of Truscon Integral Waterproofing Paste applied in a plaster coat. (See Specification above.)

Specifications for Ferritex

All concrete shall be dampproofed by the application of (1 to 5) thorough brush coats of Trusco Ferritex and water (a porous concrete requires a greater number of brush coats than a dense concrete), as manufactured and recommended by THE TRUSCON LABORATORIES, Detroit, Mich.

Condition of Surface—The surface shall be thoroughly cleaned of dirt, grease and foreign matter.

Application—A practical method of mixing Ferritex with water is to dump 10 lb. of Ferritex in a 10-qt. pail and add just enough water to cover the Ferritex to a depth of about 2 in. The Ferritex stays at the bottom, and in application the brush should be brushed back and forth over this layer of Ferritex under water and then applied to the wall. Use Ferritex freely. Mix only as much Ferritex with water as can be used immediately. Allow 5 or 6 hours in between coats for development, spraying the surface with water frequently in the meantime.

Quantity Required—This depends upon the porosity of the surface, but may be roughly figured at the rate of about 10 lb. to 100 sq. ft.

Truscon Stuccotex

Paint for wet concrete and masonry.

A hydraulic paint for uniforming concrete and masonry surfaces, or for decorating wet or damp stone, brick or concrete surfaces, such as swimming pools, retaining walls, etc., on which oil paints cannot be successfully used.

Stuccotex is a dry powder which is mixed with water to the right consistency and brushed onto the surface after that surface has been thoroughly saturated with water.

Stuccotex does not flake or crumble off.

Covering Capacity—125 sq. ft. per gal., 2 coats.

Specifications for Stuccotex

All wet surfaces shall be given 2 coats of Truscon Stuccotex, as manufactured by THE TRUSCON LABORATORIES, Detroit.

Condition of Surface—Surfaces to be treated with Stuccotex shall be free of all loose particles, paint, cold water paint, size, oil, grease or any other foreign matter which would retard or prevent direct contact of Stuccotex with the surface.

Preparation—Mix Stuccotex thoroughly with water in the proportion of 10 lb. (1 gal.) of dry powder with 3 qt. of water for first coat. (Second coat use 2½ qt. water to 10 lb. Stuccotex.) Mix only enough for immediate use. Any Stuccotex that has been mixed longer than two hours shall be thrown away.

Application—To the *water saturated* surface (not merely wet, but saturated) apply the first coat of Stuccotex, brushing same carefully into the pores. After the first coat has set about 12 hours, thoroughly saturate surface and apply a second coat.

Caution: Keep Stuccotex surface wet—during very warm or dry weather, spray the surface for several days while painting. Keep Stuccotex container dry and tightly covered.

Truscon Plaster Bond

A black compound for dampproofing interiors of exposed masonry walls. Plaster Bond remains flexible and tacky, providing a permanent bond for a scratch coat of plaster troweled directly onto it, thus eliminating furring and lathing. Plaster Bond is not recommended for use on ceilings.

Covering Capacity—About 80 sq. ft. per gal., 1 coat.

Specifications for Plaster Bond

The inside surface of all exposed walls of the entire building shall be given 1 uniform application of Truscon Plaster Bond as manufactured by THE TRUSCON LABORATORIES, Detroit.

The coating shall be perfectly continuous over the entire surface. In cases where the Plaster Bond cannot be run continuously back of the floor construction, it shall be applied back on the ceiling for at least 12 in. from the wall.

Special care shall be taken to coat all portions of the wall where there is any cutting out to permit the passage of pipes subsequent to the application of the Plaster Bond. All portions of the wall which are particularly absorbent shall be given a retouch coat, so that the entire area will have an even, uniform appearance.

The plaster shall not be applied until 24 hours after the wall has been coated with Truscon Plaster Bond.

Caution: Not Recommended on Ceilings. Especially adapted for dampproofing interiors of brick, block, and roughened concrete walls. If the concrete is smooth, the surface must be mechanically roughened to protect bond against normal shrinkage of plaster.

Truscon Foundation Coat

A black coating furnished ready for use (no heating) for dampproofing masonry walls below grade. Apply with a large mop or brush. More economical and satisfactory than coal tar, or pitch.

Covering Capacity—80 sq. ft. per gal., 1 coat.

Specifications for Foundation Coat

General—The outside surface of all foundation walls shall be given 2 uniform applications of Truscon Foundation Coat as manufactured by THE TRUSCON LABORATORIES, Detroit, Mich.

Condition of Surface—The surface shall be thoroughly dry and free from any adhering earth or foreign matter so as to insure the thorough penetration and bond of the Foundation Coat.

Application of First Coat—Truscon Foundation Coat shall be applied over the dry masonry surface with a large brush or mop, exercising special care to insure a uniform continuous coat. Allow 24 hours for drying time and apply second coat in one continuous application.

Truscon Foundation Coat shall be allowed to dry for at least 12 hours before being backfilled.

Truscon Temperite

Quick set and antifreeze for concrete and cement mortar.

Specifications for Using Temperite

Truscon Temperite, manufactured by THE TRUSCON LABORATORIES, Detroit, Mich., shall be used in concrete or cement mortar as directed below:

If Temperite Liquid—Thin in the proportion of 1 gal. liquid to 10 gal. water. Use this mixture of Temperite and water in place of clear water for gauging the mixture of cement and aggregate.

If Temperite Dry Concentrated—Throw 2 lb. of Temperite Dry Concentrated into the mixer for every bag of cement, turning the mixer over a sufficient number of times to insure a thorough solution and distribution of Temperite.

Truscon Super-Por-Seal Transparent Dampproofing

A transparent coating for protecting and dampproofing exterior masonry walls above grade. May be applied by brush or spray. Super-Por-Seal is also suitable for use on unexposed sides of cut stone to prevent penetration of moisture and resulting discoloration.

Specifications given in our section on Maintenance Products —see Manufacturers' Index.

Truscon StoneTex Concrete Paint

The nationally known lime-resistant masonry coating for protecting and dampproofing exterior brick, stone, stucco or concrete. Furnished in white and 10 standard shades. Applied with a brush or spray. Prevents cold and moisture from filtering through masonry walls and avoids disintegration of concrete. Renovates and beautifies masonry buildings.

Covering Capacity—About 100 sq. ft. to gal., 2 coats.

Truscon Floor Hardeners

Truscon Ferricon (Metallic)—See Truscon Ferricon below.

Metallic—Truscon Floor Hardener is a metallic hardener designed for giving floors in factories, warehouses and such places greater resistance to wear. Forms a dense, hard finish. Especially applicable to new cement floors, or to floors which need resurfacing.

Quantity required: 30 lb. to each 100 sq. ft.

Chemical Dry—Agatex Crystals, a chemical hardener for cement floors, furnished in dry form. Dissolved in water and applied with a brush or broom.

Quantity required: about 1 lb. to each 50 sq. ft.

Chemical Liquid—Agatex Liquid, a chemical hardener furnished in highly concentrated form for stopping dusting and crumbling of cement floors. Applied with a brush, broom or similar convenient instrument.

Quantity required: about 1 gal. to each 100 sq. ft.

Truscon Ferricon

A "super" floor hardener of the metallic type—that is, a hardener embodying the full wear-resisting qualities of Truscon Metallic Floor Hardener, together with the new product, Truscon Zilicon. The presence of Zilicon in metallic floor hardener provides a concrete of greater strength and tends to increase its resistance to acid and alkali. Zilicon imparts marked plasticity and workability to the floor topping. Truscon Ferricon produces one of the hardest, toughest and most wear-resisting cement floor surfaces it is possible to obtain.

Quantity required: 30 lb. to the 100 sq. ft. of surface. Dusted on same as regular Truscon Floor Hardener.

Specifications

For complete specifications on Truscon waterproofings and dampproofings, ask for a copy of "Truscon Architects' Specifications Book 'A.'"

THE VORTEX MANUFACTURING CO.

The Par-Lock Method of Preplastering Treatment

1978 West 77th Street, CLEVELAND, OHIO

APPLIED BY LICENSED PAR-LOCK APPLIERS IN

ALBANY, N. Y.
ATLANTA, GA.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
DETROIT, MICH.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEWARK, N. J.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
ST. LOUIS, MO.
SCRANTON, PA.
TORONTO, ONT.
TRENTON, N. J.
YOUNGSTOWN, OHIO
WILKES-BARRE, PA.

General

THE VORTEX MANUFACTURING Co., the owner of the Par-Lock and Dens-tect processes, furnishes equipment especially designed for those applications, and manufactures all asphalt materials. The Par-Lock Appliers operate under license agreement with THE VORTEX MANUFACTURING Co. insuring application of correct material in accordance with manufacturer's specifications.

Materials

The asphalt compounds used are blended of natural (lake and native) asphalts under strict supervision, and laboratory tests are made of each batch.

All asphalt is applied through a patented equipment especially designed to handle heavy bodied asphalts, insuring greater protection. Exclusive devices have been developed for use in conjunction with the asphalt gun for the application of the Par-Lock key and Dens-tect aggregate.

Responsibility

The license agreement between THE VORTEX MANUFACTURING Co., and each Par-Lock Applier insures the use of materials specifically compounded for each respective phase of dampproofing and waterproofing. It also assures application in accordance with proven specifications, the result of experience on a wide variety of work covering thousands of applications throughout the whole country, during a period of fifteen years.

What the Par-Lock Plaster Key Is

The Par-Lock Plaster Key is a nationally used and approved dampproofing, preplastering treatment for ceiling and wall surfaces to be plastered direct. Par-Lock treatment consists of multiple coats of specially blended pure asphalt, gun-applied under high pressures, and a final coat of special graded grit likewise mechanically applied to the final coat, providing a positive key of definite strength.

It may be defined as either a dampproofing which affords an efficient mechanical plaster key or as a plaster key which includes a superior job of dampproofing.

Par-Lock
The *Master* Plaster Key

What the Par-Lock Plaster Key Does

The asphalt used in Par-Lock treatment possesses sufficient ductility and adhesive strength (in excess of its tensile strength) to meet all conditions imposed by the plaster application.

The Par-Lock Plaster Key insures permanent plastering by:

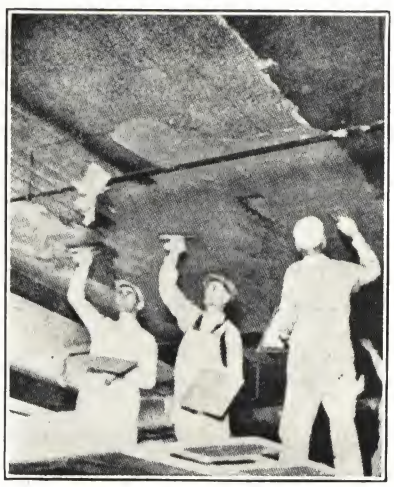
(1) Dampproofing the structural surface back of the plaster.

(2) Providing a key or clutch with a strength many times in excess of the requirements imposed by the weight of the plaster.

(3) Preventing the breakdown of the plaster crystal by reactions which many times result from contact between the structural surface and the plaster.

(4) Adjusting the difference in expansion and contraction between the plaster material and the structural surface.

(5) Overcoming insufficient, excessive or irregular suction in the structural body.



Plastering Over Par-Lock

Where the Par-Lock Plaster Key Is Used

Par-Lock is recommended as preparation for the following surfaces when plastered direct—(1) concrete slab ceilings, (2) tile and concrete joist ceilings, (3) concrete beams, columns and stair soffits, (4) interior of exterior walls.

Par-Lock Specification

All (architect to indicate surfaces here) within the building receiving plaster finish direct are to be prepared for plastering according to Par-Lock Specification Form "B," of THE VORTEX MANUFACTURING Co., Cleveland, Ohio.

The surfaces receiving Par-Lock are to be turned over to the Par-Lock Applier clean and free from dirt, oil and other foreign matter and with all large projections removed and all holes and masonry joints pointed up in a workmanlike manner, in proper condition to receive the Par-Lock application.

Note: Any plastering materials may be used over this specification, except plasters made of portland cement mortar or putty gauged with portland cement. When Keene's cement is used, it is to be applied over gypsum brown mortar, or gypsum wood fibre plaster used directly over the Par-Lock Key.

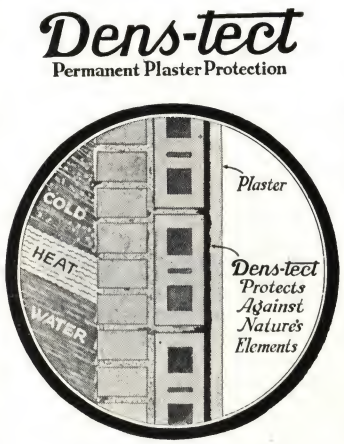
What the Dens-tect Wall Treatment Is

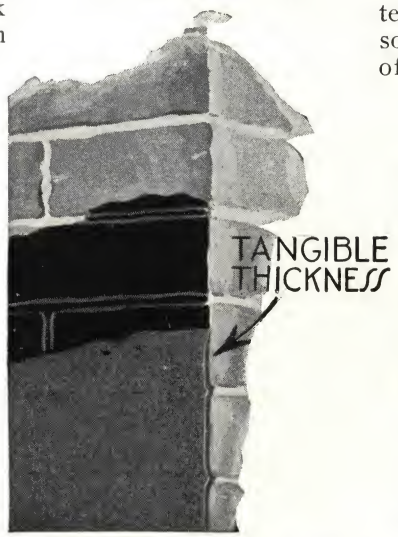
Dens-tect is a gun-applied wall treatment that offers an impervious coating of tangible thickness. It fills every void in the masonry and is built out to afford a lasting resistance to moisture.

The Dens-tect application comprises a heavy gun-applied priming coat of asphalt followed by a coating of asphalt and finely graded aggregate thoroughly mixed at the nozzle.

Introduction of the aggregate into the asphalt at high velocity and at right angles to the surface drives it into all minor cracks and crevices common to all masonry, and builds up a heavy uniform thickness of mastic coating, from six to eight times the thickness of film dampproofing.

The result of the gun application: the coating is uniform in thickness, follows the irregularities of the surface and does not destroy the keying effect of wall irregularities.





What Dens-tect Wall Treatment Does

(1) Dens-tect treatment provides an effective check against wall leakage by filling voids and offering a continuous coating over wall surface.

(2) It supplants furring, saving cost and floor space and eliminates ceiling and floor troubles resulting from moisture which is absorbed through the outer wall and transmitted to the floor slab from the space between the wall and inside of the furring.

(3) It provides a uniform plaster base, overcoming irregular suction in the masonry and insuring uniform quality of plaster-finish and permanence of decoration.

The roughened surface formed by the aggregate, together with the manner in which application follows the contour of the wall provides ample bonding properties.

Where Dens-tect Is Used

Dens-tect treatment is recommended for application to the interior of exterior masonry walls and other masonry surfaces where a high degree of dampproofing protection is desirable.

Dens-tect Specification

The interior of all exterior walls above grade shall be treated in accordance with the Par-Lock Dens-tect specification of THE VORTEX MANUFACTURING CO., Cleveland, Ohio.

The surfaces receiving Dens-tect are to be turned over to the Par-Lock Applier clean and free from dirt, oil and other foreign matter and with all large projections removed and all holes and masonry joints pointed up in a workmanlike manner, in proper condition to receive the Dens-tect application.

Note: Any plastering materials may be used over this specification, except plasters made of Portland cement mortar or putty gauged with Portland cement. When Keene's cement is used, it is to be applied over gypsum brown mortar or gypsum wood fibre plaster, used directly over the Dens-tect key.

How Par-Lock Asphalt Differs from Ordinary Dampproofing Compounds

Much confusion exists regarding natural asphalts and various petroleum asphalts and coal tars which vary widely in physical characteristics according to their origin and the processes by which they are produced.

For reasons of uniformity, permanence and efficiency, only natural (lake and native) asphalts are used in the preparation of Par-Lock asphalt materials. These are blended according to formulæ developed by many years of intensive laboratory experimentation and field experience, to produce the specific physical qualities necessary to meet the requirements of service, and are thinned with volatile ingredients having an affinity for asphalt.

Both the raw material and finished product of every run are carefully tested for physical characteristics and purity and contain no materials dissimilar to asphalt which might impair their strength or durability.

A different blend is employed for each specification to meet the requirements of the specific service.

Wherein the Par-Lock Application Method Differs from Other Methods

All Par-Lock applications are made with patented equipment specially designed to handle heavy-bodied asphalts without heating, as a consistency which would be impractical for application by hand brush or spray devices designed for paint application. This equipment builds up a heavier asphalt coating than is possible by any other application methods—thus insuring maximum protection. In contrast with brush and trowel application, made with a lateral motion, Par-Lock high-pressure equipment drives the heavy bodied material into the pores of the masonry at right angles providing a most effective covering.

Complete Service by Par-Lock Appliers

Par-Lock Appliers, with carefully prepared and tested materials, with specially designed equipment and experienced operatives under supervision of trained engineers, render complete service on all types of dampproofing and waterproofing required in building construction, including the following:

Dampproofing of masonry walls to be plastered direct.
Dampproofing back of furring.
Spandrel beam waterproofing.
Membrane waterproofing for basement walls, floor footings, etc.
Foundation waterproofing for exteriors below grade.
Dampproofing surfaces to be finished with Portland cement or tile.
Dampproofing walls to be insulated with corkboard.
Gun-applied protective coatings on cold storage interiors.

Par-Lock Appliers are listed in local directories under the name "Par-Lock Appliers of (name of city)."

Descriptive Literature, Specifications, Data

Illustrated descriptive literature, specification forms and detailed information on Dens-tect and Par-Lock treatments will be furnished by THE VORTEX MANUFACTURING CO., 1978 West 77th Street, Cleveland, Ohio, or by any licensed Par-Lock Applier.

TOCH BROTHERS INC.

(ESTABLISHED 1848)

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R.I.W. REMEMBER IT'S WATERPROOF
Reg. U. S. Pat. Off.
TRADE-MARK

Damp-proofing

No. 232 "R.I.W." Damp-Resisting Paint—A black, elastic, full-bodied, tacky, damp-proofing and plaster bond paint for brush or spray application to the interior surfaces of exterior masonry walls to which hard wall plaster is to be directly applied. Prevents the penetration of dampness, and renders the inside of walls verminproof and stainproof. Not to be used on ceilings (except under special instructions), nor must concrete or portland cement mortar be applied directly over it.

"R.I.W." Semi-mastic Dampproofing Plasterbond—Similar to No. 232 except that it is a heavier bodied composition for brush application.

"R.I.W." Plastertox—A mastic dampproofing and plasterbond for trowel application, similar to No. 232 except made in the mastic form.

No. 110 "R.I.W." Damp-Resisting Paint—A black, alkaliproof and waterproof, elastic paint to protect limestone, marble, granite and other cut stone from the chemical action and discoloration due to alkali in cement, and to moisture. Also resistant to mild acids.

"R.I.W." Marine Cement—A black, damp-proof, heavy body liquid paint for brush application to the exterior of foundation walls and footings; concrete floor slabs, and wood sleepers laid in concrete. Does not need to be heated.

"R.I.W." Liquid Konkerit (Patented)—Priming and finishing cement paints, ready for use, for damp-proofing, beautifying and overcoming the natural porosity of exposed stucco, concrete and masonry walls. In white and colors. Dries with a flat finish. For gloss finish apply "R.I.W." Flex-Sicco Paint.

"R.I.W." Toxloxpore—A colorless, damp-proofing liquid, especially adapted for application to brick, concrete, stucco, limestone, and Bedford stone. When applied to a perfectly dry surface it will prevent the development of efflorescence and the penetration of dampness.

Caulking and Pointing Compound

"R.I.W." Elastic Caulking Compound furnished in consistency for gun method and knifing use. Colors, gray and caenstone shades; other colors can be made to order.

This compound is a waterproof, elastic, non-staining material for the pointing of terra cotta, stone joints, etc., and for caulking metal or wood doors, frames, etc.

Waterproofing

"R.I.W." Toxement (Patented)—*Made in powder, paste and liquid form* for the integral waterproofing of all portland cement construction such as concrete foundations, floors, walls, bridges, piers, reservoirs, cement mortar and stucco. It lubricates the concrete, increases flowability and workability with the minimum amount of water, assuring a thorough and non-porous mix and eliminates necessity for extreme tamping and chuting.

"R.I.W." Tox-Mix Clear—A colorless liquid to be used integrally in portland cement mixtures, such as concrete, cement floors, stucco, brick mortar, etc. When this solution is used a great increase is obtained in the early tensile and compressive strength of portland cement mixtures and it renders the resulting concrete or cement mortar permanently hard and dense.

Membrane Method—*"R.I.W." Self-Healing Bridge Cement*—A black viscous non-hardening material without sulphur content that is unaffected by vibration and which remains elastic at low temperature and will not run in summer. Used in conjunction with 7-oz. untreated burlap or with waterproof felt paper in two or three-ply to give an elastic and effective waterproof membrane.

"R.I.W." Toxmix Colored (Paste Form)—For coloring, hardening, dustproofing and densifying concrete floors. Combines the advantage of an alkali-proof coloring material with a hardening and densifying medium, also possesses great weatherproofing properties.

Furnished in various colors.

Concrete and Wood Floor Protective Coatings

"R.I.W." Cement Filler (Transparent) and "R.I.W." Cement Floor Enamel, in Colors (High Gloss)—Designed for use on dry concrete or wood floors. These floor coatings penetrate the pores; neutralize the lime inherent in concrete; harden the surface and prevent cement dusting.

"R.I.W." Toxbro, Wood Floor Preservative and Filler—A light straw colored material for application to wood floors or other wood surfaces, for binding wood fibres together; it also prevents grain of wood from rising and insures a smooth surface, prevents slivering, splintering, cracking and checking.

"R.I.W." Flintox—A chemical solution which reacts with cement and precipitates zinc silicious materials in the pores of concrete. Intended primarily as a surface hardener, but because of the reaction and precipitation referred to, material may be said to function as a binder and dust preventive.

Steel Preservative Paints

"R.I.W." Tockolith (Patented)—A cement basic anticorrosive paint, gray in color, used for priming iron, steel or other metal. A finishing coat must always be applied according to the character of the finished surface required and the nature of the service expected.

No. 1017-A "R.I.W."—An acidproof, alkaliproof and waterproof paint for application to steel or wood. Furnished in black, red, brown, dark green and other colors.

Nos. 110 and 112 "R.I.W." Damp-Resisting Paints—Waterproof paints which have wonderful resistance to the alkalis in cement mortar or concrete. Recommended for finishing coat on structural steel building frames, brine and condenser pipes, etc. Furnished in black and maroon.

No. 137 "R.I.W."—A bright red paint recommended either for interior or exterior use. Used on steel structures exposed to the weather; roofs, gutters, gas holders, tanks, etc., and where acid fumes prevail.

No. 49 "R.I.W." Damp-Resisting Paint—A high grade, exterior exposure paint made in black or dark olive green. Withstands the action of locomotive gases, acids and other fumes to which railroad bridges and viaducts are subjected. Used on tanks, linea smokestacks, etc.

"R.I.W." No. 708 Gray—A gray, flexible, acidproof and waterproof paint for interior or exterior exposure. Resistant to sulphur fumes, ammonia gases and electrolytic corrosion.

Enamels and Wall Coatings

"R.I.W." Hospital and Laboratory Enamel—A waterproof, white, hard usage enamel which resists the action of sulphuretted hydrogen, gases and fumes of acids and other chemicals. Used principally in hospitals, laboratories, bathrooms, kitchens, milk stations, engine rooms, etc.

"R.I.W." Plaster Primer—A liquid coating of semi-opaque character, made in white (can be tinted with color in oil), intended for direct application to clean plastered walls. It overcomes the alkalinity of unpainted plastered walls and obviates the necessity of using sizing materials: i.e., glue size, sealing varnish or similar preparations.

"R.I.W." Machinery and Pipe Enamel—Intended for use on dynamos, transformers, steam and electric stationary engines, compressors, mill and other machinery, guards, rails, etc.

Specialties and Service Department

Our Technical Service Department can be of assistance to our clients where special materials are required or where unusual conditions are to be contended with.

Correspondence and personal inquiry are invited on technical paint and damp-proofing and waterproofing problems.

Complete Architects Specification Folder and Color Cards Available on Request

ESTABLISHED 1903

THE WALTERS COMPANY

Manufacturers of Silica Waterproofing Products

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WATERPROOFING WALLS AND FLOORS

To Make Leaky Brick Wall Watertight

Specifications—Apply two coats of Effluro-O-B over all brick walls as per directions of the manufacturers, THE WALTERS COMPANY of Passaic, N. J. and New York, N. Y.

To Waterproof Concrete

Specification—For mass concrete add 1 gallon of Silica-L to every yard of concrete, 1-2-4 mix.

To Waterproof Walls and Floors

Specification—Add 1 quart of Silica-L to every bag of cement, 1-2 mix.

FLOOR HARDENER

To change soft cement floors into hard rocklike floors.

Specifications—Wash all floors with Rock Top in 2 coats as per directions of the manufacturers, THE WALTERS COMPANY of Passaic, N. J. and New York, N. Y.

ELIMINATING EFFLORESCENCE

Efflorescence is a combination of the soluble salts in brick and mortar which creates a chemical reaction when rain strikes the walls—brick alone will not cause efflorescence.

Efflorescence can be eliminated by following our instructions.

We eliminate efflorescence by changing the soluble salts of the mortar into insoluble salts or silicates. Consequently, if the cause of creating the chemical reaction is removed, the result is a clean appearing brick wall. Not only will our treatment prevent efflorescence, but it will also waterproof your mortar. The entire procedure is extremely logical and practical.

Specifications—Add 1 gallon of Silica-L to every 10 gallons of water. Add 2 pounds of Silica-L-P to every bag of cement in place of lime.

TO WASH DOWN BRICKWORK

We do not use or recommend the use of acids. Instead, we recommend EFFLURO, a product of THE WALTERS COMPANY that will positively not injure your walls.

Specification—Wash down all brickwork with Effluro as per the directions of the manufacturers, THE WALTERS COMPANY of Passaic, N. J. and New York, N. Y.

THE WATERPROOFING COMPANY

345 East 33rd Street
NEW YORK, N. Y.

65 Albany Street
BOSTON, MASS.

Product and Services

Manufacturers of "Cow Bay" Waterproof Cement.
Engineers and Contractors for Waterproofing, making a specialty of Cement Waterproofing. We contract for the waterproofing of basements, subways, reservoirs, vaults, tunnels, swimming pools, etc., guaranteeing a positive and permanent waterproofing of all kinds of masonry construction.
Designers and builders of Reinforced Concrete Construction.

THE WATERPROOFING CO. ESTABLISHED 1909 NEW YORK BOSTON COW BAY WATERPROOF CEMENT

TRADE-MARK
Reg. U. S. Patent Office

Experience

The Waterproofing Company introduced and perfected cement waterproofing. During the past 27 years this company has successfully completed thousands of difficult contracts in every section of North America, and have gone as far afield as Japan.

Advantages of "Cow Bay" Cement Waterproofing

No extra excavation nor supporting walls required. Walls are left with a neat finish; no furring and plastering being necessary. Floor coating serves both as waterproof seal and floor finish. "Cow Bay" waterproof coating is as hard as the best portland cement finish; placed beneath grillages and column bases without danger of settlement.

Difficult Waterproofing Job Successfully Handled

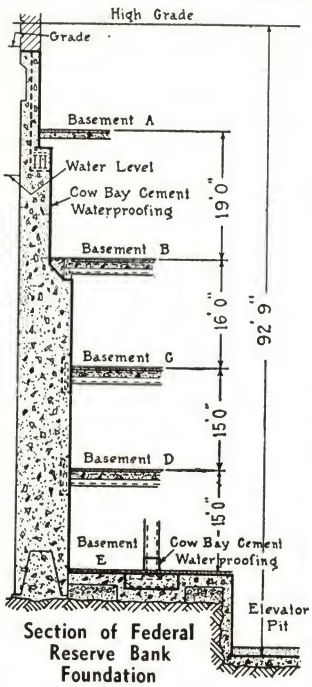
The foundations of the Federal Reserve bank building, the deepest in New York, presented a most difficult waterproofing problem. These foundations were successfully waterproofed by us.

"Cow Bay" Waterproofing Specifications

Material—All interior surfaces of all exterior walls and upper surface of concrete floor slab throughout basement (or subbasement), elevator pits, machinery foundations, trenches, etc., as shown on plans, shall be waterproofed with "Cow Bay" Waterproof Cement, applied by The Waterproofing Company.

Workmanship—All surfaces, before application of waterproof coating, shall be thoroughly chipped and cleaned, and coating applied not later than 24 hours after surface has been so prepared. A perfect bond must be secured with underlying masonry. Wall waterproofing shall be ⅝-in. thickness, applied in two coats. The floor work shall be 1 in. in thickness and is to serve as a wearing surface as well as a waterproof coating. All waterproofing shall be floated and troweled to a smooth and even finish free from imperfections.

Guarantee—The Waterproofing Company shall furnish written guarantee that all coating placed by them will be waterproof; that during a period of 2 years after completion of the work, they will promptly repair any leaks appearing through their waterproofing which are not due to causes beyond the waterproofer's control.



Section of Federal Reserve Bank Foundation

A Few Important Waterproofing Contracts

New York, N. Y.

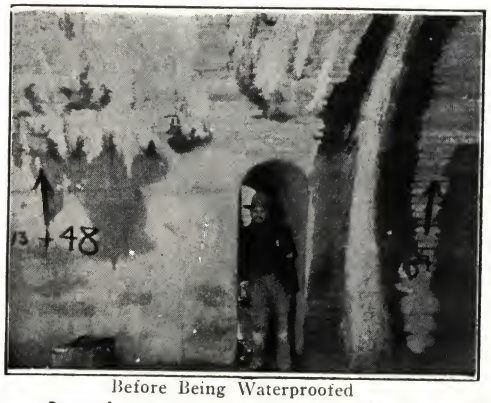
New York Telephone Co., Washington, Barclay, West and Vesey Sts., McKenzie, Voorhees & Gmelin
City Bank Farmers Trust Co. Building, Cross & Cross
Federal Reserve Bank, York & Sawyer
Woolworth Building, Cass Gilbert
Irving Trust Building, 1 Wall St., Voorhees, Gmelin & Walker
New Equitable Trust Building, Trowbridge & Livingston
Chase National Bank, Graham, Anderson, Probst & White
Bank of New York and Trust Co., B. W. Morris
New York Hospital, Coolidge Shepley Bullfinch & Abbott
Columbia-Presbyterian Hospital, James Gamble Rogers
Hudson Terminal Building, Clinton & Russell
American Telephone & Telegraph Co., Welles Bosworth
Stock Exchange, Trowbridge & Livingston
Equitable Society Building, Starrett & Van Vleck
Seaman's Church Institute, Warren & Wetmore
Savoy-Plaza Hotel, McKim, Mead & White
Allerton Hotels, 38th, 55th and 57th Sts., Murgatroyd & Ogden
Church of the Heavenly Rest, B. G. Goodhue Associates
Museum of the City of New York, Joseph H. Freedlander
Central Hanover Bank & Trust Co., 70 Broadway, Cross & Cross

Boston, Mass.

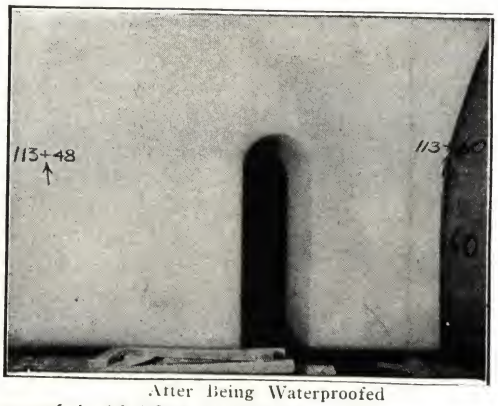
15 Buildings for Harvard University Coolidge Shepley Bulfinch & Abbott
Botany and Vivarium Building, Wellesley College, Charles Z. Klauder
Harvard School of Business, McKim, Mead & White
Federal Reserve Bank, R. Clipston Sturgis
National Shawmut Bank, Parker, Thomas & Rice
Old Colony Trust Company, Coolidge & Shattuck
John Hancock Building, Parker, Thomas & Rice
Sears, Roebuck & Co., Nimmons, Carr & Wright
United Shoe Machinery Co. Building, Parker, Thomas & Rice
Faulkner Hospital, Oscar A. Thayer
State Armory, Norwood, Mass., McLaughlin & Burr

Miscellaneous

Mitsui Bank, Tokyo, Japan, Trowbridge & Livingston
State Office Building, Albany, N. Y., State Department of Architecture
Bamberger Department Store, Newark, N. J., Jarvis Hunt
Royal Bank of Canada, Montreal, Can., York & Sawyer and S. G. Davenport, Associate
Ohio Bell Telephone Bldg., Cleveland, Hubbell & Benes Co.
Miners Bank Building, Wilkes-Barre, Pa., W. L. Stoddart
Oliver Office Building, Pittsburgh, Pa., D. H. Burnham & Co.
7 Telephone Buildings in various cities, John T. Windrim
55 Telephone Buildings, Voorhees, Gmelin & Walker



Before Being Waterproofed



After Being Waterproofed

Pennsylvania Tunnels Before and After Being Waterproofed with "Cow Bay" Waterproof Cement

WESTERN WATERPROOFING COMPANY, INC.

Waterproofing and Dampproofing Engineers and Contractors

82 West Dedham Street,
BOSTON, MASS.

NEW YORK, N. Y., Grand Central Building

BUFFALO, N. Y., 316 Jackson Building

Services

WATERPROOFING of Basements, Tanks, Tunnels, and other Masonry.

RESTORING DISINTEGRATED CONCRETE.

All work executed by us under contract and guaranteed.

Methods

Leakage may be permanently prevented in new structures and cured in existing ones by waterproofing with materials and methods developed and perfected by WESTERN WATERPROOFING COMPANY, INC. Several thousands of structures have been waterproofed by us in the last decade or two; our work has stood the test of time and we guarantee every job we undertake. Our company knows that best results can be guaranteed only if the work is done by experienced workmen under expert supervision. We therefore have developed and maintain a highly trained organization for the execution of all our work, capable of overcoming every kind of waterproofing problem. We sell no materials.

Ironite Waterproofing

Each job requires varied and individual treatment as to method and materials. As a basic material *Ironite* gives the most satisfactory and lasting results. It is a finely pulverized iron combined with chemicals. Applied with water, the iron swells and completely fills and seals the pores of the concrete. *Ironite Waterproofing* bonds so perfectly to the structure that it will resist any hydrostatic pressure the structure is capable of withstanding.

Ironite may be used in conjunction with other materials. A more complete description of *Ironite* and our methods is given in our catalogue which will be mailed gladly upon request.

Specifications

It is our preference to write a separate specification for each specific job. As a general specification the following may be used:

All surfaces to be waterproofed, comprising in general the interior surfaces of all walls and floors slabs in contact with earth, all pits, trenches and other depressions, all columns and interior division walls which penetrate the floor, together with such surfaces as may be hereinafter mentioned or indicated upon the drawings, shall be waterproofed by the WESTERN WATERPROOFING COMPANY, INC. (address of nearest office), and fully guaranteed by them, for a test period of two years. Walls shall be left with a brush [float] [steel troweled] finish. Cement floor finish over floor waterproofing is to be provided by this [mason] contractor. Necessary pumping shall be provided by the general [foundation] contractor.

Reminders

The following points are essential to a completely satisfactory waterproofing job. They are given here merely as reminders.

Have you provided continuous, accessible interior waterproofing?

Are your walls and floors reinforced against water pressure?

Are your basement floor slabs keyed into the walls?

Are your boiler pits and flues insulated against excessive heat?

Have you insured against unusual conditions in the adjoining areas—a broken water main—a clogged sewer?

Have you specified that the waterproofing be completed before interior partitions, machinery, or other obstructions are placed?

Are specially designed expansion joints required?

Are watertight construction joints provided?

The Restro-Crete System for Repairing Disintegrated Concrete Exposed to Weather.

Concrete disintegrates due to its porosity which permits the absorption of water. Alternate wetting and drying cause expansion and contraction, producing minute cracks. Temperature changes produce similar effects. As these fine cracks develop, absorption increases, soluble elements in the concrete are affected, reinforcing steel is corroded, frost action starts, disintegration visibly sets in, the structure is weakened and complete failure is not impossible.

By preventing the absorption of water the cause of disintegration is removed. That is, the problem becomes one of waterproofing, and we have therefore adapted our system of waterproofing to meet this problem.

On new concrete our treatment is applied to the surfaces exposed to the weather, thus preventing absorption of water and consequent disintegration.

Old concrete where the destruction has started can be restored to its original strength and appearance by our Resto-Crete system, whereby we cut out all defective concrete; waterproof with *Ironite,* which provides a perfect bond; build up to the original surface; then apply *Ironite* to all the weather exposed concrete; and, where necessary for appearance, add a final coating to match the newly rebuilt areas with the old surfaces.

Resto-Crete results are absolutely guaranteed.

Other Work

WESTERN WATERPROOFING COMPANY, INC., is also prepared to undertake and guarantee the results of the following:

Waterproofing—Swimming pools, reservoirs, dams, retaining walls, etc.

Prevention of Absorption—In fuel oil tanks, gasoline and light oil tanks, molasses tanks, pickling vats, unusual oil containers, etc.

Protection—Of floors and walls of packing houses, soap factories, tanneries, dairies, etc., against the action of soaps, greases, fats, tannery liquids, dairy acids, etc.

SUPERIOR CLEANING AND WATERPROOFING COMPANY

Mason Contractors Specializing in Cleaning and Repairing Stone, Brick, Terra Cotta and Marble Structures

248 Powers Building
ROCHESTER, N. Y.

BRANCH OFFICE
ALBANY, N. Y., 11 North Pearl Street

"Superior" Service

The Superior Cleaning and Waterproofing Company has specialized for over 20 years in cleaning new and old buildings; repairing stone, brick, terra cotta and marble structures; cleaning, repairing and resetting interior marble and stone by the use of modern electrical devices; exterior caulking and waterproofing; dampproofing of interiors.

Rapid Transportation of Equipment Anywhere

All "Superior" equipment is mounted on high speed motor trucks, enabling rapid transportation with economical handling to any location. No service charge for inspection—nation wide service.

Guarantee

All "Superior" work is absolutely guaranteed.

Cleaning is done by the method best suited to the nature of the material to be cleaned, and we guarantee not to injure the surface. The work is accomplished by the latest and best equipment in the hands of skilled, reliable workmen. All operations are fully insured.

Estimates and References

Estimates gladly furnished. Time will be saved if you send dimensions, plans, or photographs of work to be done and description of material.

We can also refer to many architects and owners whom we have served satisfactorily and will send their names on request.

"SUPERIOR" PROCESS FOR CLEANING AND FINISHING

Chilled Steam Blast Cleaning

This process is approved by many of the largest stone and marble companies in the country and is certified by the A. C. Nielsen Company, Neutral Engineers of Chicago, Ill., who made an impartial investigation in collaboration with owners, architects and engineers.

This system employs a finely divided spray of chilled steam and water projected against the building at a very high velocity.

This spray enters the minute surface depressions and dissolves, dislodges and washes away grime, dust, soot and all extraneous surface matter that has been deposited on the building exterior.

The result is a natural weathered appearance, the stone retaining its natural surface and original color tone free from surface roughening, dulled arrises and carvings, or dead bleached tone.

This method is suitable also for cleaning down new stonework. New stone cleaned with chilled steam blast usually has a greater apparent range of color tone and texture than when hand cleaned, because it rids the pores of stone dust and dirt accumulated in cutting and setting.

Eastman Kodak Co. Building, Rochester, N. Y.
Brickwork and terra cotta chilled steam cleaned, tuck pointed and repaired

Sandblast Cleaning

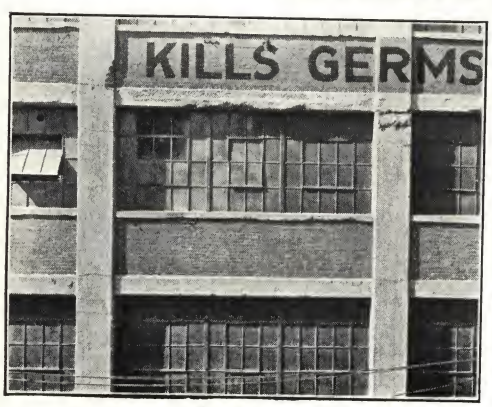
We use this process also and recommend it primarily for restoring painted masonry to its original newness, matching up old brick structures to new additions and on certain types of masonry structures where our long experience has shown that it gives satisfactory results.

Sandblast is not recommended by us for use on terra cotta, face brick, or any glazed material. On special material where the texture and finish require it other abrasives are employed by us in place of sand.

Artistic Wood Graining and Cutting

Used for interior woodwork and paneling. By this special treatment a beautiful antique finish can be produced and special designs can be created in the wood. This treatment, an adaptation of the airblast process, uses special abrasives for cutting.

REPAIRING AND WATERPROOFING OF MASONRY STRUCTURES



Before

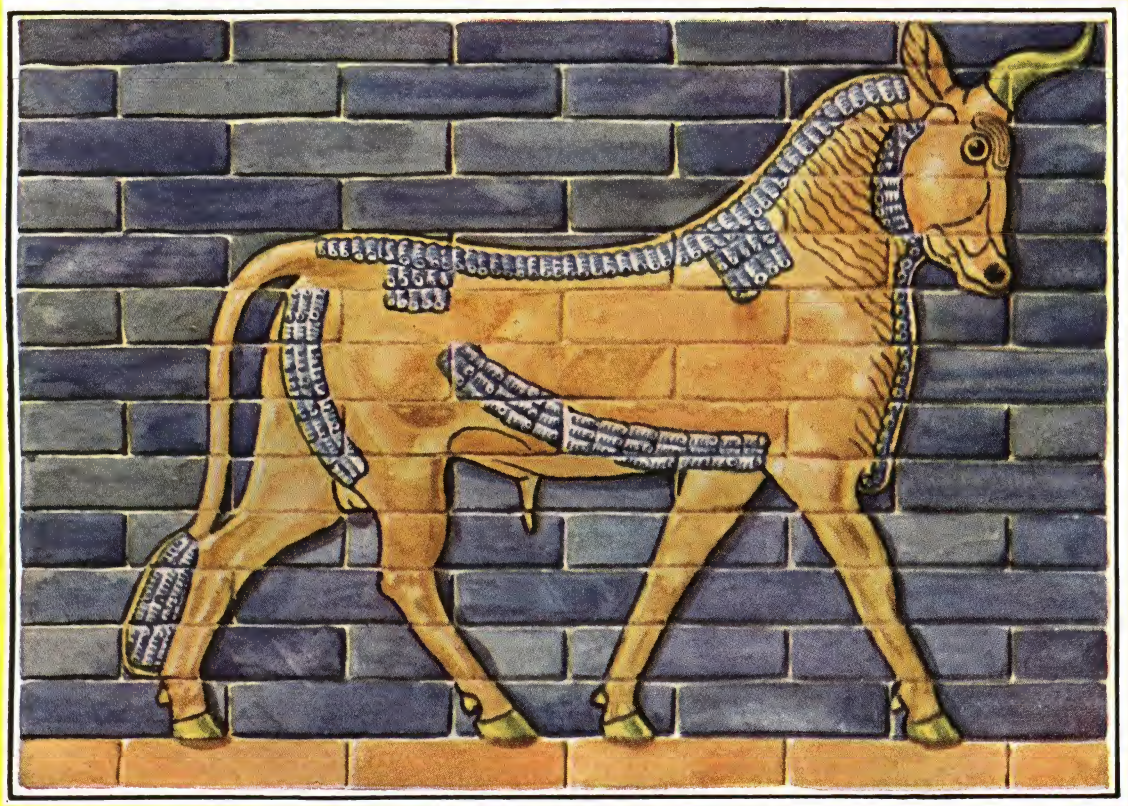
We have successfully repaired many structures of stone, brick, terra cotta and marble, and stand ready to prove the efficiency of our methods in this class of work.

Back of Superior's highly specialized knowledge of cleaning and repairing stand years of experience in actual building construction. "Before" and "After" illustrations show B. T. Babbitt Co. Building, Albany, N. Y., a reinforced concrete building—deterioration repaired, waterproofed and restored.

After

BRICKWORK
◆ ◆ ◆
STONEWORK
◆ ◆ ◆
ARCHITECTURAL TERRA COTTA

AMERICAN ENAMELED BRICK



EARLIEST EXAMPLE OF THE USE OF ENAMELED BRICK

A Panel from the ANCIENT ISHTAR GATE of BABYLON

Original in State Museum, Berlin

"The largest and most striking ruins in Babylon and of all Mesopotamia"—(Koldwey, in "Excavations at Babylon").

The following are the words of King Nebuchadnezzar, from the great Steinplatten Inscription:

"Istar-sakipat-tebisa of Imgur-Bel and Nimette-Bel, both entrances of the town gates, had become too low, owing to the filling up of the street of Babil. I dug out that town gate, I grounded its foundations, finding the water strong with bitumen, and baked bricks, and caused it to be finely set forth with baked bricks of blue enamel on which wild oxen and dragons (sirrus) were pictured. I caused mighty cedars to be laid lengthwise for its ceiling. Door leaves of cedar covered with copper thresholds and hinges of bronze I fitted into its gates. Lusty wild oxen of bronze and raging dragons I placed at the thresholds. The same town gate I caused to be made glorious for the amazement of all peoples."

AMERICAN ENAMELED BRICK CORPORATION

Graybar Building, 420 Lexington Avenue

NEW YORK, N. Y.

SOME RECENT REPRESENTATIVE INSTALLATIONS OF AMERICAN ENAMELED BRICK

1—Office Building, 120 Wall Street, New York, N. Y.
2—Bricken Building, 39th Street and Broadway, New York, N. Y.
3—Cushman's Bakery, White Plains, N. Y.
4—Screen Chamber, Mamaroneck, N. Y.
5—Apartment House, Brooklyn, N. Y.
6—Grover Cleveland High School, Ridgewood, N. Y.
7—Gottfried Brewing Co., New York, N. Y.
8—Fire House, Hillcrest, N. Y.

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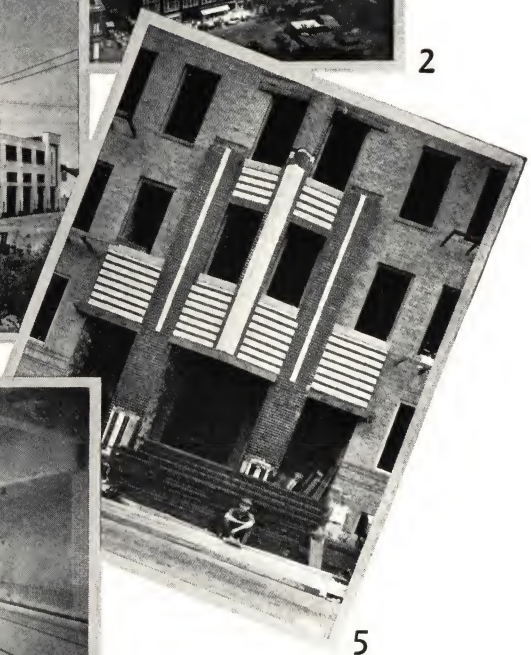

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AMERICAN ENAMELED BRICK

A product of wide variety and improved manufacture for the most modern effects in the treatment of exterior and interior wall surfaces

VARIOUS KINDS OF BRICK

Enameled Brick

Having a brilliant, high gloss finish of an opaque enamel in a wide range of colors and mottles. Particularly adapted for fine exterior work where light reflection or a high degree of sanitation or ease in cleaning are desired.

Matt Glaze Brick

Identical with enamel brick as to materials, properties, colors, etc., but characterized by a soft egg-shell surface that makes it particularly adapted for exterior work, especially on large surfaces. A beautiful texture whose possibilities are receiving growing recognition.

Bristol Glaze Brick

Available only in a light buff. The natural color of the fired brick is covered with a transparent glaze adding to this popular color the protective and light-reflecting qualities of a glass-hard surface.

Double Unit Brick

A brick known as the American Double Unit Brick is a recent addition to the products of the company.

The standard shape is twice the height of the ordinary brick and a mortar joint.

Tru-Edge Brick

At a nominal extra charge, any of the above may be ordered to be ground to exact dimensions.

This is particularly advantageous when the utmost in sanitation is required.

It provides an absolutely straight mortar line, so that mortar joints need not exceed 1/8 of an inch.

It has been used especially for swimming pool construction, and for dairies, markets, bakeries and similar uses where frequent washing of walls, and especially with live steam, makes a wide mortar joint undesirable.

STANDARD AND SPECIAL SHAPES

A large and complete line of *standard* shapes, in a considerable variety of colors, is carried in stock at all times for immediate shipment. The large bulk of these shapes includes those which have been demonstrated to be the most satisfactory and commonly used in general construction. The immediate availability of this large stock makes it possible to reduce delay in manufacture and delivery to a minimum.

Special shapes, of which those most commonly required are hereinafter shown, are carried in stock to a reasonable extent. Modern manufacturing equipment, however, makes it possible to produce specials other than stock shapes in from 1 to 3 weeks instead of from 4 to 6 weeks as formerly required.

Any other special shapes can be made to architect's specifications. In these cases from 2 to 4 weeks are required, from the time of receipt of detail drawings.

Special Arch Brick Work

No arches are carried in stock, but are made to order to architect's specifications. The illustrations hereinafter shown give dimensions for standard and special shapes, so that these may serve as a guide for details of special arches.

It is necessary to allow from 4 to 6 weeks for the accurate production of arch brick, and it is requested that details be furnished as far as possible in advance of the time that the arches will be required.

PROPERTIES AND SPECIAL FEATURES

Durability of Enamel

All bricks are made by single-fire process (in a modern tunnel kiln) which causes the enamel to be fused to the body in a close bond so that it cannot spall or lift from the face of the brick, nor crack from internal stresses. Technical research within the past few years has reduced "delayed" crazing to negligible proportions.

Enameled brick, through improved control of processes, is warranted to the extent to which *any* ceramic building material can be made free from tendency to craze or check without impairing its other properties or causing other and more serious defects.

Brick is fired to cone 10, in temperatures ranging up to 2600 degrees Fahrenheit. This high fire, which is directed very slowly, produces a hard durable finish that is not obtainable with soft lead or borax glazes or with a lesser degree of heat.

Bonding

Careful control of the extent of vitrification of the body of the brick results in a product that is easily bonded in the wall, and that does not slip, as is the case when the body is burned too hard.

Structural Strength

An outstanding characteristic of enameled brick is its structural strength, with a compression point of 5,000 lbs. per square inch. This permits its use in load bearing in the wall, while at the same time employing its advantages of cleanliness, light reflection, and decorative beauty.

Light Reflection

The following tabulation of tests by Prof. W. J. Drisko, of the Massachusetts Institute of Technology, will indicate the light-reflecting value of enameled brick:

White enameled brick.....75%-80%
Impervious face brick, unglazed.....42%-44%
White salt glazed brick.....35%-37%
White painted plaster (after 2 years).....40%-45%

Acids

The surface of enamel, matt glaze or Bristol glaze brick is impervious to oils, greases, alkalies, atmospheric impurities and ordinary acids.

Sulphuric, nitric, or hydrochloric acids, even in concentrated form, will not affect these enamels, but if used as a wash, even if diluted, they will attack the cement mortar.

The only commercial acids that will attack these enamels are hydrofluoric and hydrofluosilicic.

Cleaning

Under most conditions the surface can be easily cleaned with soap and water. In cases of extreme and long-continued exposure, some alkaline solution, such as caustic soda or sodium carbonate, will clean the enamel and not affect the mortar.

Economy

The first cost of enameled brick is the last as they can never become dislodged from vibration or settling of the building. Enameled brick can be bonded in and used as a part of the bearing walls, cheapening the cost of construction considerably by eliminating 4 inches of common brick or back-up tile.

Method of Laying

If enameled brick is improperly laid, it may develop defects that have no relation to the merit of the product, and against which no manufacturing skill can provide. The points in correct laying are few and very simple. A mortar composed of one part of cement (any desired brand) and three parts sand (no more) will give satisfactory results. There should be *no lime* in the mortar. The brick should *not* be soaked before laying in the wall. It should be laid with a flush joint. If these simple precautions are observed, a wall of enameled brick will be permanent, free from discoloration, and impervious to the elements.

GENERAL INFORMATION

Grades

American brick comes in two qualities.

Supergraded—This is as perfect as modern equipment, human skill, and rigid inspection can produce in the present state of the art. Used especially for fine interior work which is subject to close and critical observation. Such uses as swimming pools, hallways, doorways of distinction, monumental work, etc., are characteristic.

Standard Grade—Standard grade brick, except to the most critical trained eye, has for the most part the appearance of Supergraded brick, owing to the rigid standards by which the latter is selected. The defects of the remainder are practically unnoticeable, and in any event do not impair in the least the serviceability of the brick, but permit its use, at a lower cost, for all surfaces where the requirements do not call for the last word in finish.

Standard grade is suitable for all forms of commercial work, large wall areas either at low or high levels from the eye, tunnels, subway and railroad stations, gas and auto service stations, etc.

Extent of Distribution

While in the 39 years of its existence the Company has sold enameled and glazed brick throughout North and South America, and extensively in Europe and Australia, the bulk of its business is concentrated in the Eastern part of the United States and Canada. Within that territory exceptional distribution facilities have been developed, which are gradually being extended.

Delivery

The ability to depend on delivery schedules, whether on standard or special shapes and colors, is a matter of vital importance to architect and builder.

To that end, small spot stocks of American brick are available for emergencies through eighteen distributors. An average stock of two months production of standard shapes and qualities, and of many special shapes, is available at factory.

Most special shapes or colors are available for shipment in from one to three weeks. Further, an accurate delivery schedule, changed as conditions warrant, enables our representatives to make dependable delivery promises.

Within 80% of its domestic territory, 24 hour delivery from receipt of order can be made on stock materials if conditions require it.

The development of special equipment permits the shipment of most special shapes in from 1 to 3 weeks instead of from 4 to 6 heretofore required.

The factory is located but an hour's travel from the New York office, and is so situated as to permit shipping over either the Pennsylvania or the Central Railroad of New Jersey, and their connecting lines. It is also located on tidewater, so that shipment can be made by vessel for coastwise or export delivery.

Every production unit in the factory has its duplicate, eliminating the possibility of delay of orders through breakdowns, should they occur.

Methods of Packing

Several methods of packing are employed. For carload shipments, bricks are either packed in straw, or, at a nominal charge, are individually wrapped in chipboard envelopes. The latter is recommended as it largely eliminates danger of damage on the job. For less carloads for shipment as minimum carloads in bulk, wrappers are added, and for less carloads shipped as such, the bricks are wrapped and packed in barrels or boxes, with an appropriate charge to cover the bare cost.

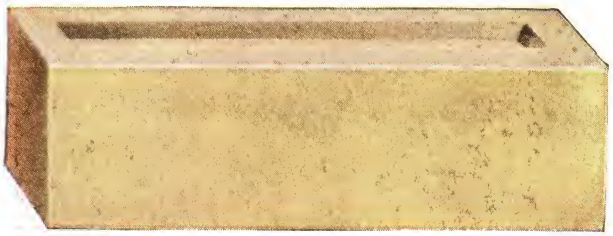
A WIDE VARIETY OF COLOR

While for years the use of white has predominated in enameled brick (and the production of a good white calls for the utmost in skill and experience), the variety of stock colors has been greatly expanded through improved manufacturing facilities.

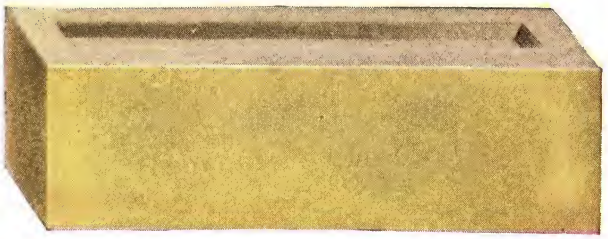
Here are shown the regular stock colors (except white), as examples of the many possible color combinations. These divide themselves into three general classifications (besides white, No. 101, and cream, No. 302) viz.: solid colors, mottles (harmonizing with granites and marbles) and delicate pastels.

There is available on special order a wide range of other tones and colors. Architects seeking new and interesting effects will be pleased with the possibilities heretofore not available in enameled or matt glazed brick. Almost any color or shade can now be made to suit the architect's requirements, and samples will be gladly prepared at any time.

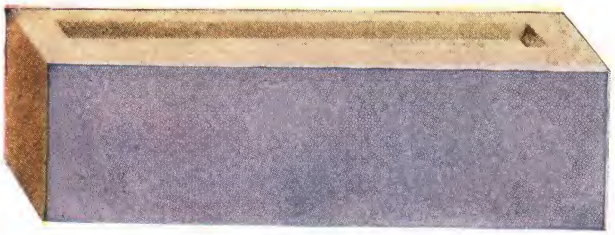
On all Supergraded deliveries, regardless of shapes, uniformity of shade is maintained within such close limits that the architect may depend on securing his intended effects.



Cream—302

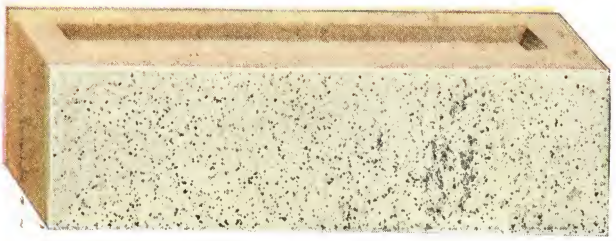


Bristol Glaze—303

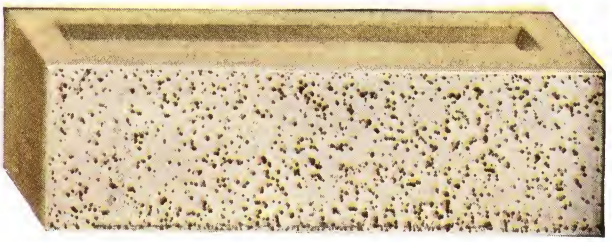


Orchid—801

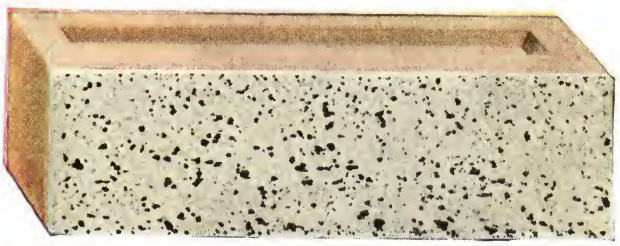
Lavender—901



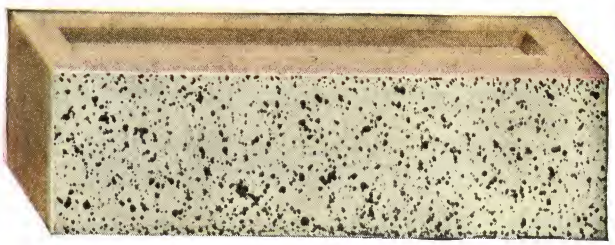
Gray Mottled—10 M



Brown Mottled—20 M



Gray and Black Mottled—35 M

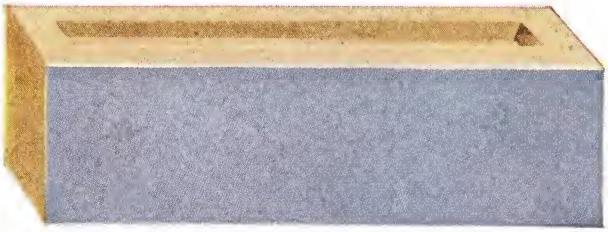


Black Mottled—45 M

STOCK COLORS

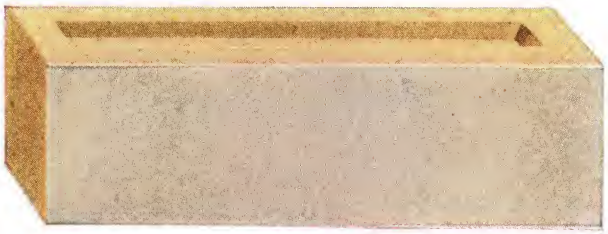
Sage Green—1101

Forest Green—1102

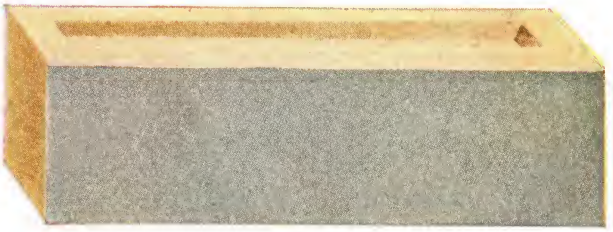


Robin's Egg Blue—501

Midnight Blue—502



Light Gray—701



Mouse Gray—702

Red Brown—401

Chocolate Brown—601

Black—201

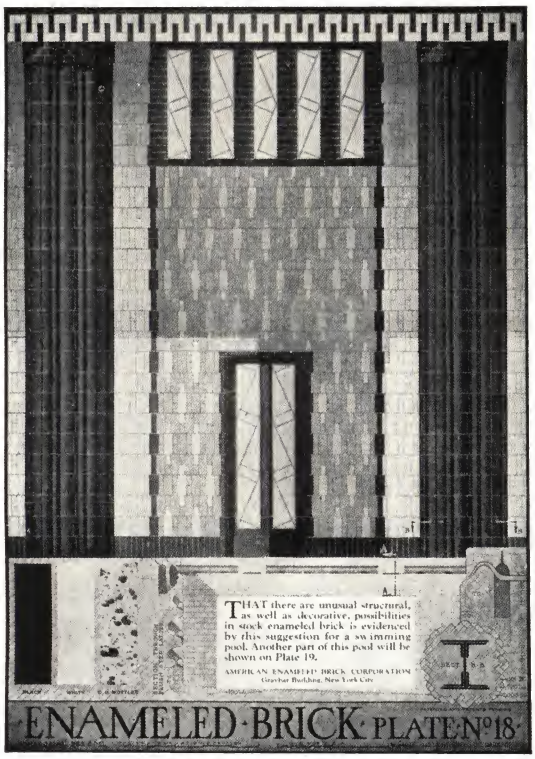
Maroon—1001

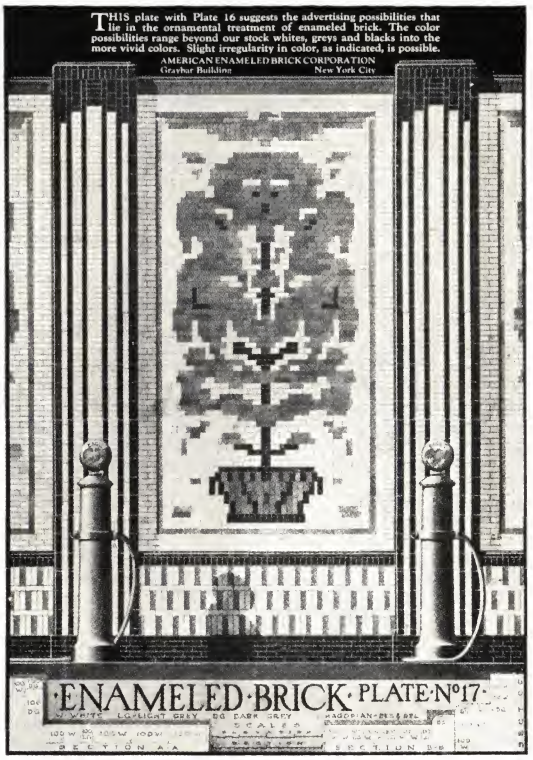
STOCK COLORS

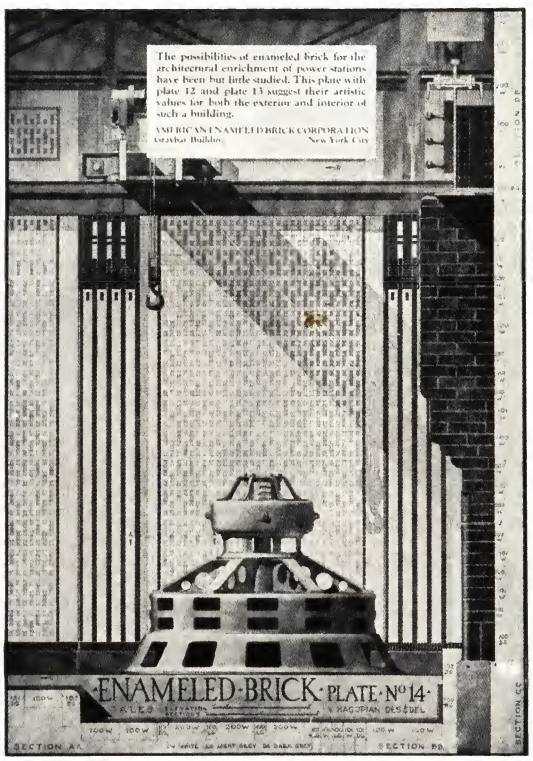
ENAMEL BRICK IN MODERNISTIC DESIGN

Few materials lend themselves so effectively to the modern trend in design as does enameled brick. Its brilliant surface, its flexibility in size and shape, and its structural strength all commend it. This is notably true of black brick, where the popularity of this "color" in decoration is met by a product that is permanent and free from cracking through temperature changes—a danger inherent in many of the other black materials now used.

A series of 18 imaginative studies by Vahan Hapogian (of which several are reproduced below) suggest what can be done with standard shapes and only two or three standard colors. The many special shapes and colors that are also available offer to the architect an unlimited scope for variety of treatment, both in design and structure. A portfolio containing the entire series, enlarged, will be mailed promptly on request.







AMERICAN BRICK UNIT

From the days of ancient Assyria there has been no effective substitute for enameled brick where its special properties are required.

Years of creative design by architects; the experience of builders, and the improvement in equipment and processes in the ceramic industry, have added to the traditional brick shape and size a series of shapes that offer extraordinary flexibility in use.

SPECIFICATIONS

Enameled Brick

Enameled brick shall be [state size, quality, color and shade number] as manufactured by the AMERICAN ENAMELED BRICK CORPORATION, 420 Lexington Avenue, New York, N. Y., or approved equal. The enameled surface shall be smooth, lustrous, impervious and opaque and shall resist sulphuric, nitric and hydrochloric acids even in concentrated form.

Matt Glazed Brick

Matt glazed brick shall be [state size, quality, color and shade number] as manufactured by the AMERICAN ENAMELED BRICK CORPORATION, 420 Lexington Avenue, New York, N. Y., or approved equal. The enameled surface shall be smooth, impervious and opaque, with an egg-shell finish, and shall resist sulphuric, nitric and hydrochloric acids even in concentrated form.

Corners, Returns, etc.

All external and internal corners, window and door openings shall be returned with [architect to state whether round or square—bullnose or quoin corners are desired].

Cove Brick

For rooms where only a wainscoting is called for cove brick shall be used to form sanitary cove base with the necessary mitres at internal and external corners, using ogee specials for cap course.

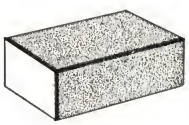
100
STRETCHER

200
FLAT STRETCHER

DOUBLE STRETCHER

300
STRETCHER ON FLAT

400
LIPPED STRETCHER



101
HEADER

301
DOUBLE HEADER

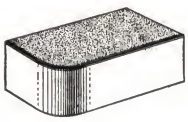
401
LIPPED HEADER

102
QUOIN

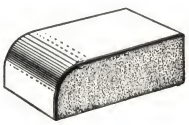
202
FLAT QUOIN

302
DOUBLE QUOIN

402
LIPPED QUOIN



103
BULLNOSE

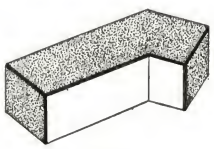


203
FLAT BULLNOSE

303
DOUBLE BULLNOSE

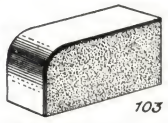
500
OCTA. CHAMFER

600
EXT. OCTAGON

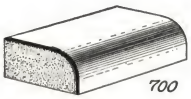


601
INT. OCTAGON

STOCK SHAPES


103
STANDARD BULLNOSE

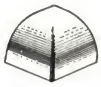
203
FLAT BULLNOSE HEADER


700
FLAT BULLNOSE STRET.

701. S.
STANDARD STARTER

701 F.
FLATTER STARTER

702-A
FLAT BULLNOSE EXT. SQUARE RET.

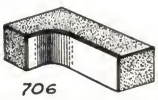

702-B
ROWLOCK SQUARE RET.

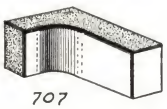
703-A
FLAT BULLNOSE

703-B
ROWLOCK ROUND RET. EXT. ROUND RET

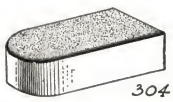
705
FLAT BULLNOSE INT. ROUND RETURN

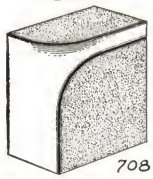
704
FLAT BULLNOSE INT. SQUARE RETURN


706
INTERNAL BULLNOSE STAND.


707
INT. BULLNOSE FLATTER

303
STANDAND DOUBLE BULLNOSE


304
FLATTER D. BULLNOSE


708
ROWLOCK SILL MITRE

BULLNOSE SPECIALS

900
OGEE STRETCHER

901
OGEE HEADER

902
OGEE QUOIN

903
OGEE BULLNOSE

904
OGEE SQUARE MITRE

905
OGEE INTERNAL BULLNOSE

OGEE MOULDS

800
COVE STRETCHER

801
COVE HEADER

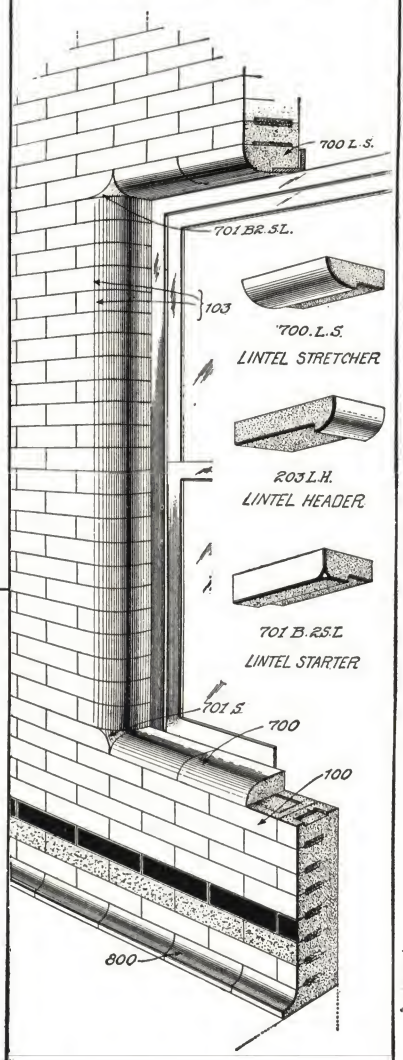
802
COVE QUOIN

803
COVE BULLNOSE

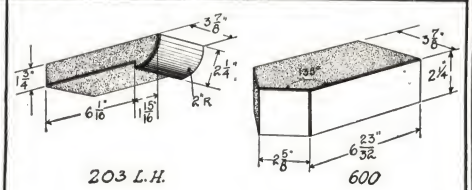
804
COVE MITRE

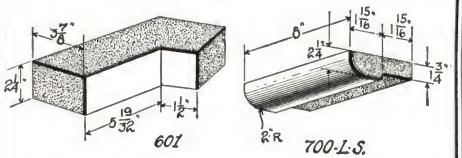
805
COVE INTERNAL BULLNOSE

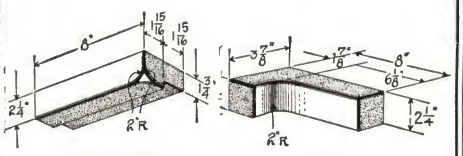
COVE MOULDS

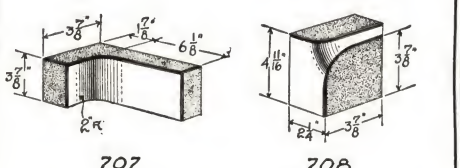


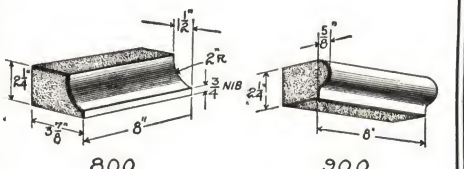
STUDY OF A WINDOW OPENING











PROJECTIONS & DIMENSIONS SPECIAL SHAPES

SHAPES AND DIMENSIONS

DOUBLE UNIT BRICK

The introduction last year of a double-unit enameled brick enormously widens the range of this product's usefulness.

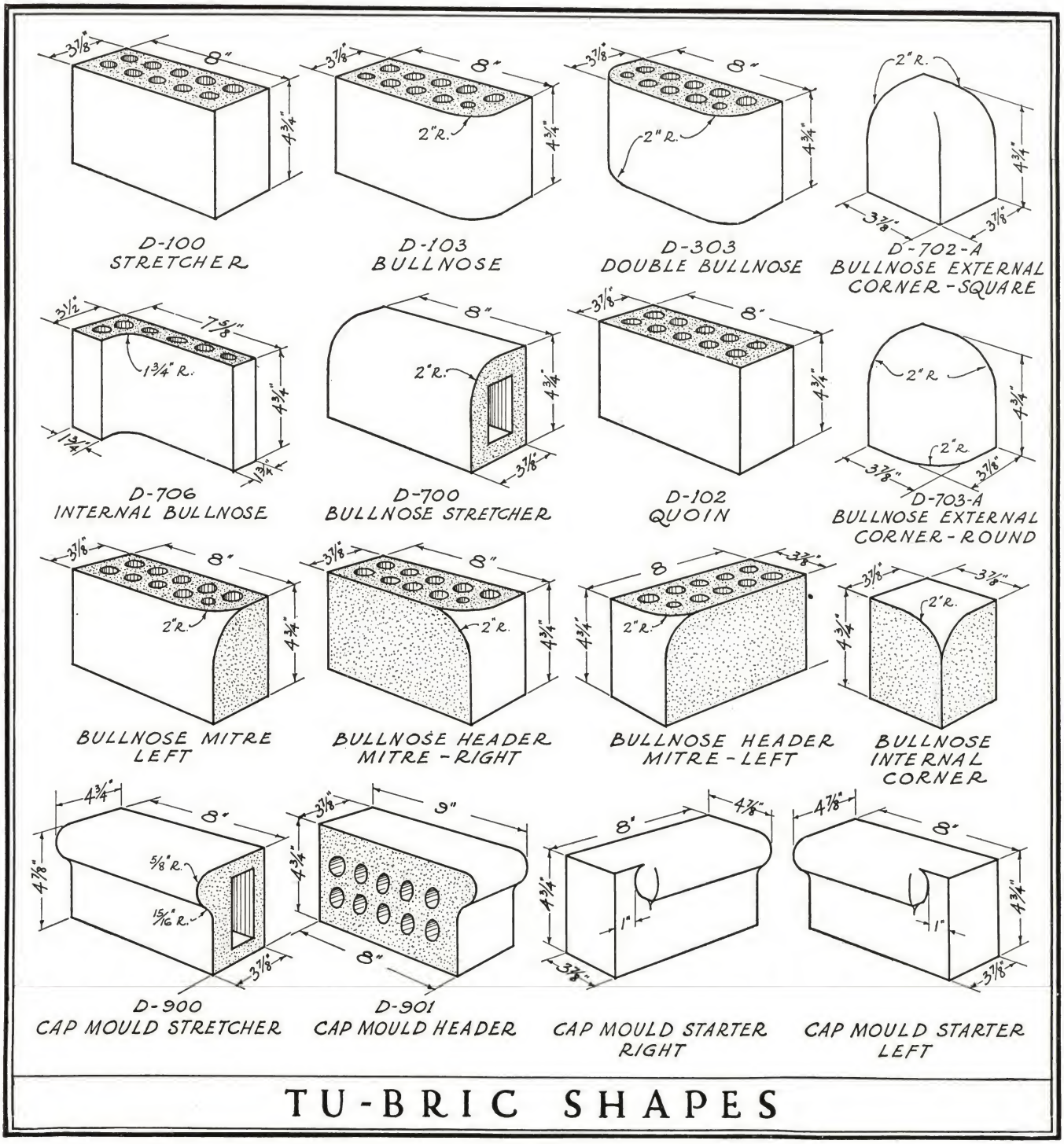
Its economy in erection is an outstanding characteristic. At every stage of handling, from delivery on the job to final laying in the wall, time is saved, in addition to a substantial saving in mortar. Careful tests indicate a saving of approximately one-third in the cost of the double-unit laid in the wall, for labor and mortar only.

Taking material costs into account at average current prices, the economy per square foot of laid wall is most striking.

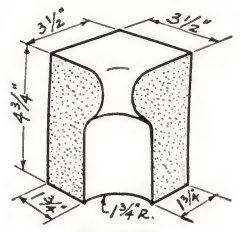
Double units are made in all the stock shapes shown for the single unit on the preceding pages, and in a full variety of special shapes, as shown below.

The same wide range of color and finish that is available in the single unit is also offered in the double unit, and the quality of the enameled surfaces secured on the double unit is in every respect equal to that on the single unit.

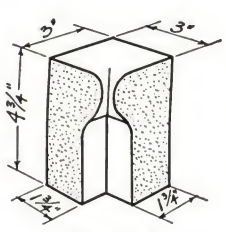
Under conditions where standard brick courses may be considered monotonous or where a special effect in large wall areas is desired, the double unit can be readily combined in random bond with the single type to secure a pleasing variety.



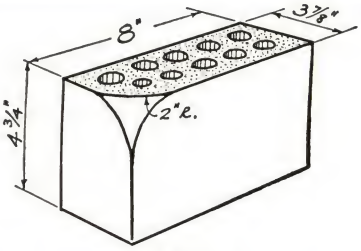
TU-BRIC SHAPES



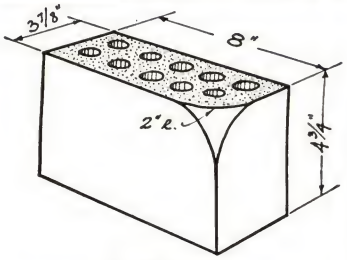
D-905
CAP MOULD INTERNAL
CORNER-ROUND



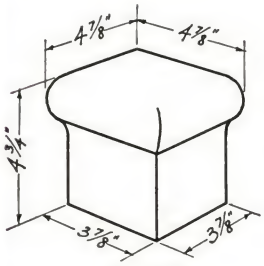
D-904
CAP MOULD INTERNAL
CORNER-SQUARE



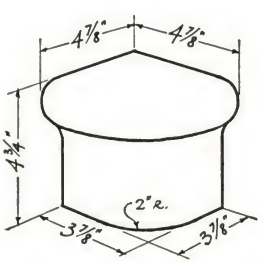
D-701-S
BULLNOSE STARTER
RIGHT



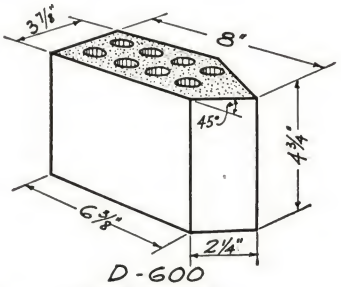
D-701-S
BULLNOSE STARTER
LEFT



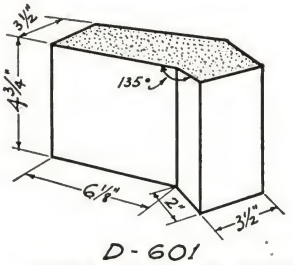
D-902
CAP MOULD EXTERNAL
CORNER-SQUARE



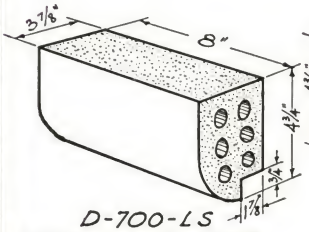
D-903
CAP MOULD EXTERNAL
CORNER-ROUND



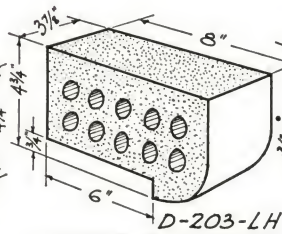
D-600
OCTAGON



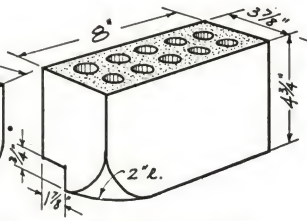
D-601
INTERNAL OCTAGON



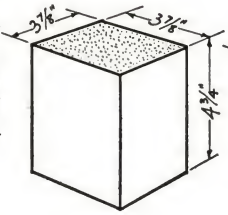
D-700-LS
LINTEL BULLNOSE
STRETCHER



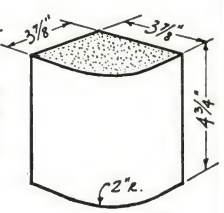
D-203-LH
LINTEL BULLNOSE
HEADER



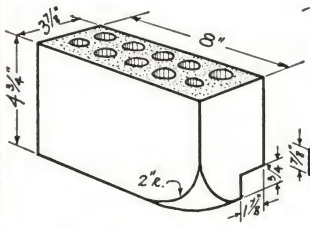
D-701-B2SL
LINTEL BULLNOSE
STARTER-RIGHT



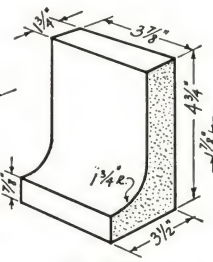
SQUARE
CORNER BLOCK



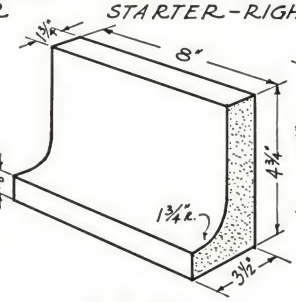
BULLNOSE
CORNER BLOCK



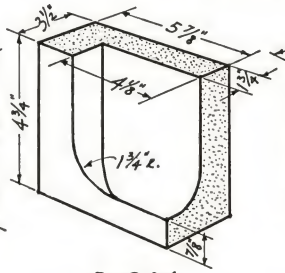
D-701-B2SL
LINTEL BULLNOSE
STARTER-LEFT



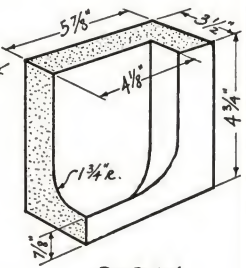
D-801
COVE HEADER



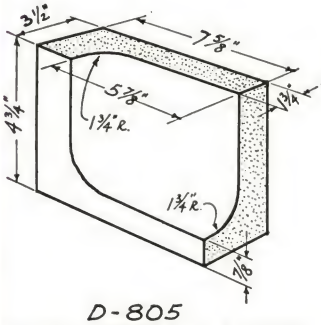
D-800
COVE STRETCHER



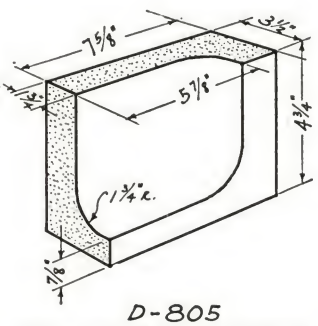
D-804
COVE INTERNAL
SQUARE COR.-RIGHT



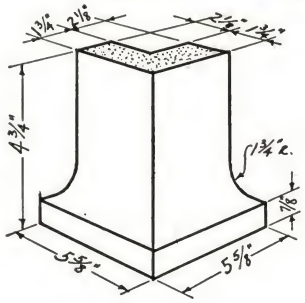
D-804
COVE INTERNAL
SQUARE COR.-LEFT



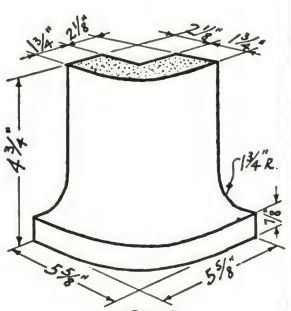
D-805
COVE INTERNAL ROUND
CORNER-RIGHT



D-805
COVE INTERNAL ROUND
CORNER-LEFT



D-802
COVE EXTERNAL
CORNER-SQUARE



D-803
COVE EXTERNAL
CORNER-ROUND

TU-BRIC SHAPES

AMERICAN ENAMELED BRICK CORPORATION

Graybar Building, 420 Lexington Avenue
NEW YORK, N. Y.

FACTORY
SOUTH RIVER, N. J.

THE CLAYCRAFT COMPANY

Manufacturers of "Perma-Chrome" Glazes; Red, Buff and Gray Face Brick in Smooth, Matt and Rough Textures

COLUMBUS, OHIO

"PERMA-CHROME" GLAZED BRICK Enduring Beauty at Moderate Cost

An Advanced Method of Permanent Color Application For Facing Interior or Exterior Walls

General Data

Process — Single fired monolithic. Glaze fused into buff fire clay base to insure freedom from spalling.

Standard Units—*Brick Size:* 8x2¼-ins. face, 3⅞-ins. thick. Weight, 4.4 lbs. *Craft Size:* 8x4⅞-ins. face, 3⅞-ins. thick—equivalent to two standard brick and a mortar joint. Weight, 9.4 lbs. *Soaps:* 1¾-ins. thick for thin walls. Sixty-five standard shapes.

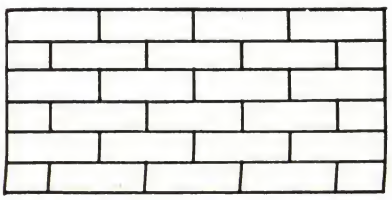
Colors—Twenty-seven standard color varieties. Samples on request.

Special Types—Special colors and shapes to meet individual requirements.

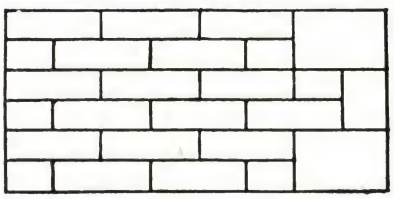
Quality—Unbiased tests in the Ceramic Laboratories at Ohio State University have proven "Perma-Chrome Glazes" to be unsurpassed.

Facilities

The building illustrated at the right required one million glazed brick. Delivery was completed in less than two months. Average factory stock over two million.



Brick Size



Brick Size, Craft Trim

New York Trust Building
41 Stories, 505 Feet High
KENNETH FRANZHEIM, Architect
Faced with "Perma-Chrome" Rippled White with Ebony Trim

Advantages

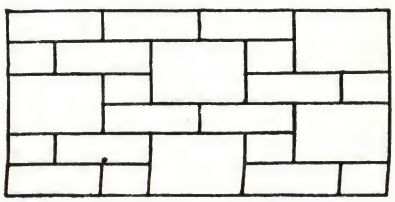
Adaptability—Unlimited play in color composition.

Simplicity and Flexibility of Face Brick—Elaborate and costly construction details are unnecessary. One square foot of wall area requires seven units in *Brick Size* or 3.4 units in *Craft Size*.

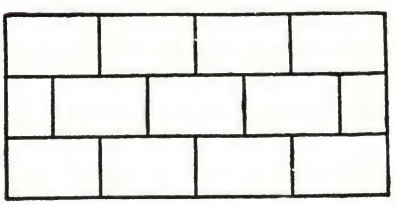
Other Features—*(1)* Load bearing units replace their equivalent of back-up masonry in the wall. *(2)* Cored standards reduce dead weight and strengthen the mortar bond. They are light enough to be economically laid with one hand and cut readily to any desired length without electric saws or special devices. *(3)* Permanent—the vitrified glaze resists acid, oil, grease, ink and dirt. *(4)* Easily cleaned with warm water and washing powder. *(5)* Ideal light reflection without glare. *(6)* Sanitary and economical.

Engineering Service

Available for quantity estimates or unusual construction problems.



Ashlar, Brick and Craft Sizes



Craft Size

"Perma-Chrome"—For Economy

Permanent color is now available at a fraction of its cost in the past. This is due to the comparatively lower cost of this material and to the economies attending construction with simplified and flexible, one-hand, load bearing units.

When consideration is given to the savings on a wall free from periodical upkeep expense, the ultimate cost is no greater than on cheaper types of construction. This broadens the field where "Perma-Chrome" or permanent color can be used.

ESTABLISHED 1885

THE BELDEN BRICK CO.

Manufacturers of "Belden Brick"

GENERAL OFFICES
CANTON, OHIO

NEW YORK OFFICE: 15 East 26th Street — DETROIT OFFICE: 2212 Book Tower

FACTORIES
CANTON, SOMERSET, UHRICHSVILLE and PORT WASHINGTON, OHIO
DISTRIBUTERS IN ALL PRINCIPAL CITIES

Product

"Belden Brick," registered U. S. Patent Office, are manufactured in five modern factories by an organization which has been successfully established for 47 years. "Belden Brick" are made of the finest shales and plastic fire clays in this section of the country, which is recognized as having the purest clays to be found.

To prevent substitution with consequent disappointment all "Belden Brick" are branded

We own shale and clay reserves sufficient to insure the production of 90,000,000 "Belden Brick" per year for more than 100 years to come.

Service

Having served the architect and builder with "Belden Brick" since 1885, we know the importance of service. We never take an order for delivery sooner than we can fulfil it or for something we are not sure we can make. You can feel sure when you place an order for "Belden Brick" that your requirements are going to be taken care of. Thirty million is a normal stock of "Belden Brick" for us to carry.

When you want samples, a panel, or a representative, please write or wire; we will take care of you very promptly.

Color

Most face brick are satisfactory structurally; the thing, however, that is of deep concern is color and texture.

Because "Belden Brick" are made in five modern factories out of the finest of shales and plastic fire clays we are able to make them in all colors from black to white and to blend these colors to procure the most charming combinations of shades. Since all colors are first drawn and piled separately, it is a simple matter to mingle them according to your requirements.

Black, all shades of chocolate and brown, buff and orange and pink, gray, gray speckled, buff speckled, reds, blues, greens, red hearts. Here is color rampant or subdued, to interpret your desires completely.

Texture

All material filling an important decorative function must rely on texture as well as color. "Belden Brick," therefore, are made with the same care and thought regarding texture as color. The variety is almost without limit, a texture to fit any design or type of building: smooth, sand finish, sand finish clinker, vertical scored, vertical matt (end cut), matt, all the standard textures, plus "Bel-Tex" and "Span-Tex," two beautiful and original textures developed by ourselves and given the mark of approval by the architects.

Size

The changes that have taken place in the size and style of buildings of recent years call for a variety of sizes in face brick—there is no reason why the unit used in the very large building should be the same size as the one used in the residence. We have successfully manufactured sizes up to 5x12-in. face. On account of the design of the machinery used in manufacturing it is very difficult to work in units longer than 12 in. When you have any problems to work out, our representatives will welcome the opportunity to consult with you.

Special Shapes and Arches

We carry in stock 45° octagons and 2-in. bullnose and are prepared to make promptly all shapes and arches. It is necessary that full size details be supplied.

Floor Brick

What is more beautiful for the den, the porch, the drive, the pergola than a rugged, deep red floor brick? We manufacture these with base course and special shapes for step risers and tread. They are also used largely for store rooms, restaurants, dairies, packing plants and other places where a highly acid resisting product is necessary.

Literature

If you do not already have our catalogue showing color plates, illustrations of a few of the fine buildings in which "Belden Brick" have been used, treatise on efflorescence and wet walls, etc., please ask for it.

Installations

The following are a few fine buildings recently erected with "Belden Brick":

Downtown Athletic Club, New York, N. Y., Starrett & Van Vleck, Architects; Thompson-Starrett Co., Contractor—70 to 79-F Dark Range, 5x11¼ in.

Pontifical College, Josephinum (near Columbus) Ohio, F. A. Ludewig & Son, St. Louis, Mo., Architects; Matt Rauen Co., Chicago, Ill., Contractor—Special No. 230 Blend trimmed with 197-F for exterior, 70 to 79-F Light Range for interior.

Western Electric Telephone Building, Watertown, Mass., Monks & Johnson, Architects, Boston, Mass.; Geo. B. H. Macomber Co., Boston, Mass., Contractor—92 to 94-F trimmed with 90-F.

House of the Good Shepherd, Hartford, Conn., Gander, Gander & Gander, Albany, N. Y., Architects; Hayes Construction Co., New Britain, Conn., Contractor—No. 130 Blend.

University of Montreal, Montreal, Canada, Ernest Cormier, Architect; Ulric & Damien Boileau, Ltd., Contractor—80 to 84-F for exterior, Smooth Cream Duplex for interior.

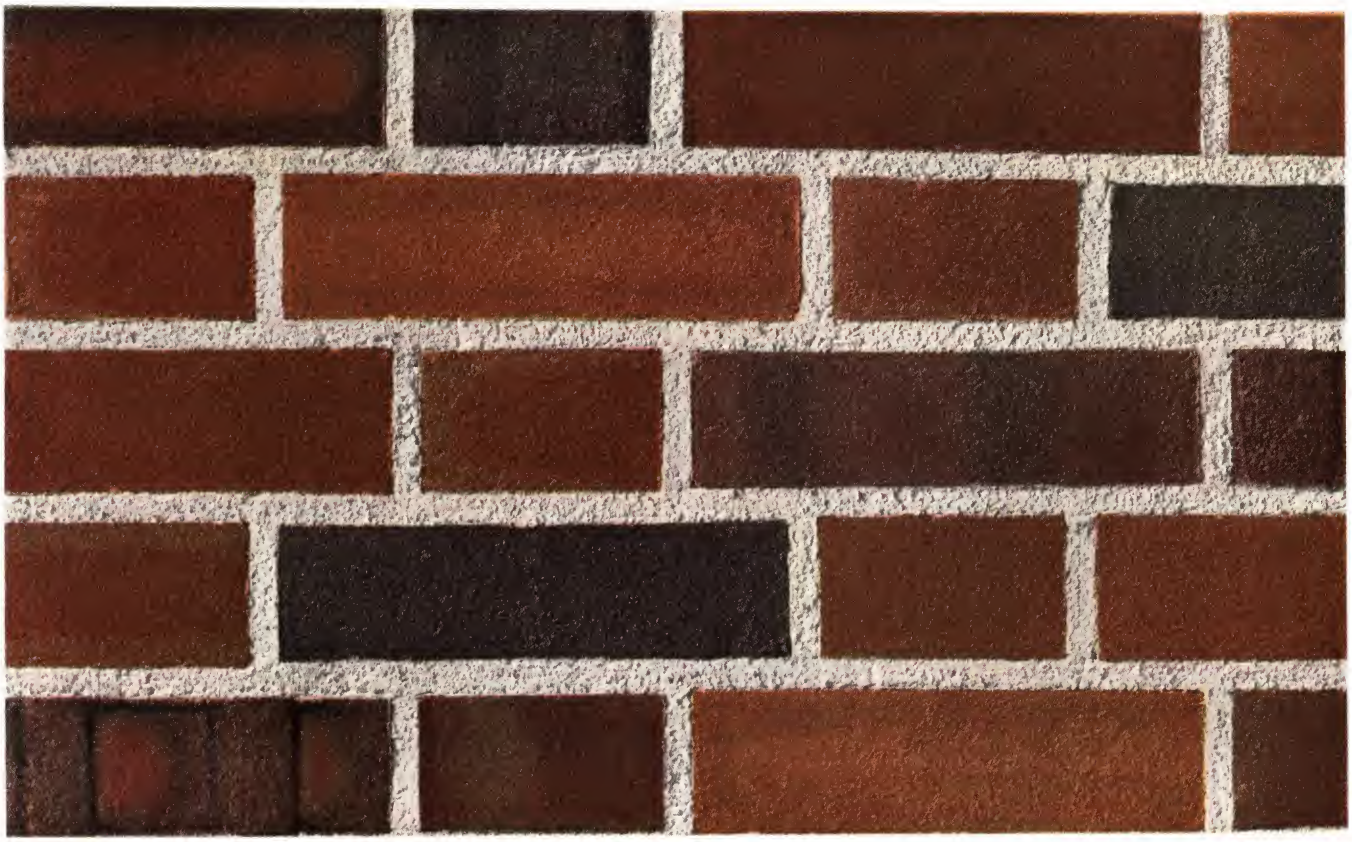
Good Samaritan Hospital, Dayton, Ohio, Schenck & Williams, Architects; Chas. H. Shook, Inc., Dayton, Ohio, Contractor—Special No. 14 Blend.

Jewish Y. M. C. A. Building, Rochester, N. Y., S. Firestone, Architect; A. Freiderich & Sons Co., Rochester, N. Y., Contractor—Special Sand Finished Mingle.

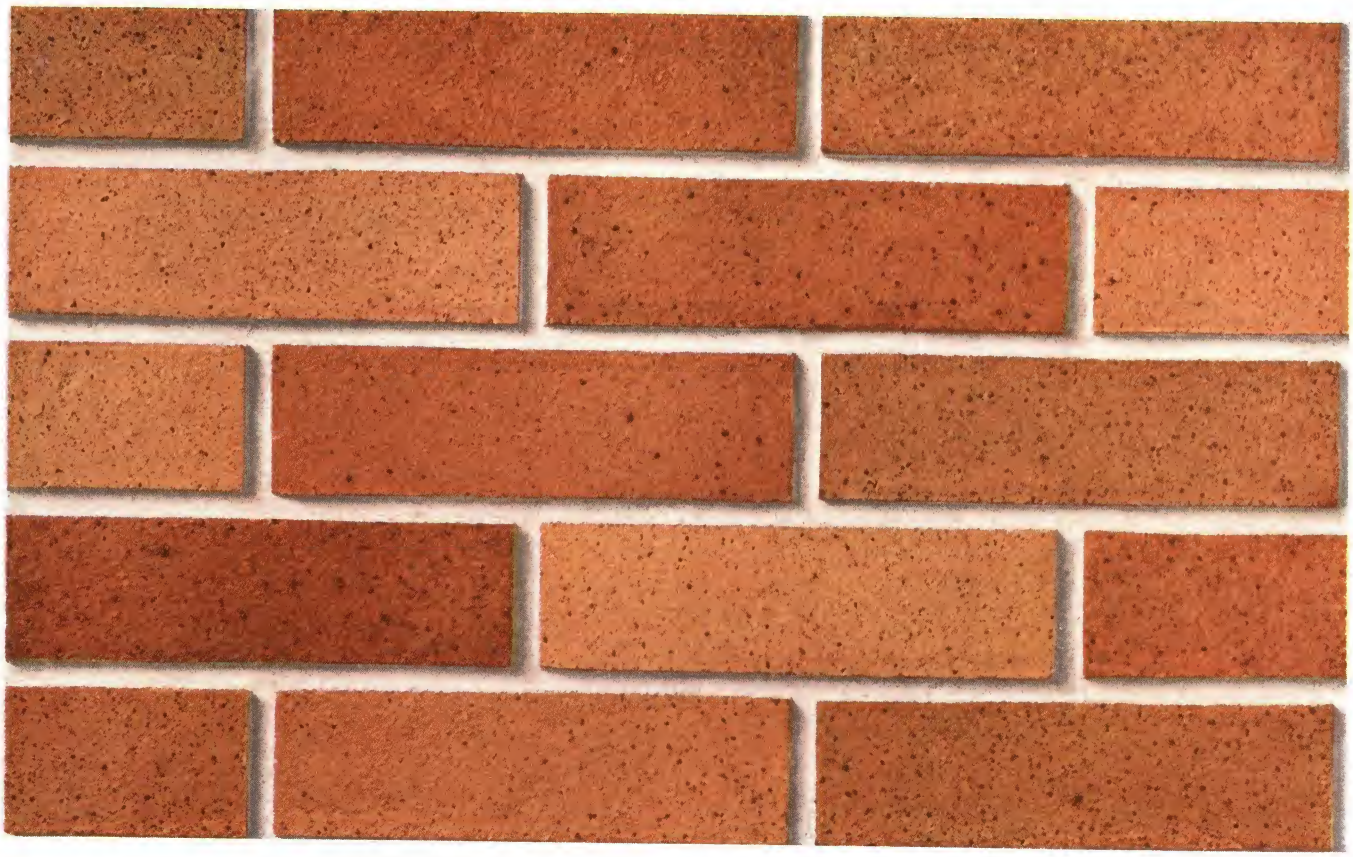
Apartment, 92nd Street and Central Park, West, New York, N. Y., Emory Roth, Architect; J. Harry McNally, Inc., Mason Contractor—Limestones trimmed with Smooth Blacks.

"BELDEN BRICK" Number 6 Blend

If you do not have it, send for our complete catalogue



"BELDEN BRICK" Number 130 Blend



"BELDEN BRICK" Shades 70 to 79 F Medium Range

If you do not have it, send for our complete catalogue

"BELDEN BRICK" Foliage Blend

FISKE & COMPANY, INC.

Manufacturers of Face Brick—Sole Manufacturers of "Tapestry" Brick

18 Newbury Street, BOSTON, MASS.
BRANCH OFFICE: 17 West 46th Street, NEW YORK, N. Y.

Products

FACE BRICK: FISKE MILTON REDS, DARLINGTON GRAYS, "TAPESTRY," "TAPESTRY" ANTIQUES, "WALDORF GRAYS," "CALEDONIAN," GENUINE HARVARD WATER-STRUCK BRICK and other high grade Face Brick.

"TAPESTRY" Granules for Asphalt Shingles.

Also Fire Brick and Brick Specialties.

Trade Names and Patents

"Tapestry" Reg. U. S. Pat. Off.
"Fiske" Reg. U. S. Pat. Off.
"Caledonian" Reg. U. S. Pat. Off.
"Waldorf Grays" Reg. U. S. Pat. Off.

To protect our customers against substitution of inferior products, these trade-marks are branded on our bricks.

"Waldorf Grays"

A new Fiske brick which in the opinion of architects is the first real match for limestone. Developed especially for the new Waldorf-Astoria. Available in oversize as well as standard sizes, smooth or stone finish.

"Darlington Gray"

A beautiful smooth surfaced brick, gray with large or small manganese specks as desired. Furnished in uniform shades of clear gray (tunnel kiln). Fiske "Darlington Grays" with the distinctive gray background they offer are increasingly popular.

Fiske B. F. 5

This is another tunnel-kiln brick furnished in a clear shade of a delicate cream buff.

Fiske B. F. 43

The same brick as the B. F. 5 with a slight color range towards the clear gray.

"Fiske" Brick

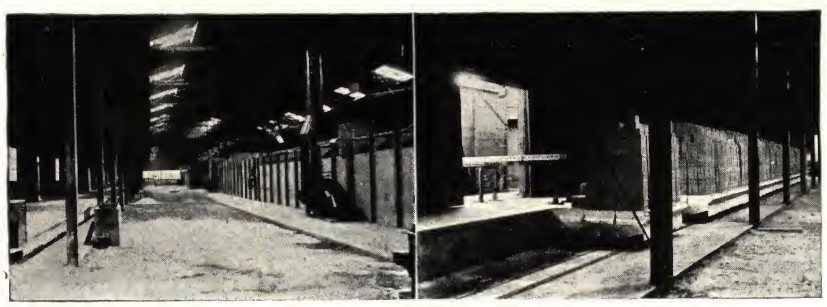
A face brick with smooth face in grays and buffs, or end-cut rough texture in full range of colors and clear reds.

"Caledonian" Brick

A horizontal rough texture side-cut face brick burned to either clear colors or a range of shades.

"Tapestry"

This brick is too well known to the architectural profession to require detailed description. Its rough texture, end-cut face and flashed shades have become so popular that in many instances the name "Tapestry" has been applied to all brick approaching this description. Architects know that there is only one "Tapestry" Brick—that to get "Tapestry" Brick color effects "Tapestry" Brick must be used.



View of a Fiske Tunnel Kiln

To protect both the architect who is building for distinction and the owner who takes pride in having the best, we mark each brick with the name "Tapestry."

"Tapestry" Brick

"Tapestry" Antiques

A variation of Fiske "Tapestry" Brick. These are, as the name implies, irregular bricks that might have come from an old English wall. Their shape and extra-flashed colors make "Tapestry" Antiques ideal for certain work.

Fiske Brick Colors

Fiske colors cannot be copied.

Individual deposits of raw material, expert, specialized firing, painstaking selection for shade and range make possible brick that no one else can duplicate. By the same token your order with Fiske can *always* be duplicated. An example of this is shown in an addition to the Union Trust Company Building, Providence, R. I., where the architect, George Frederick Hall, recently matched the Fiske Brick he used when he built the original structure 21 years before.

Pastel Shades

FISKE & COMPANY, INC., has pioneered so many new developments in brickwork that architects will not be surprised to learn Fiske Brick are now available in a wide range of new solid colors. The turquoise blues, coral pinks, greens, blacks and other soft pastel shades of these brick make possible many new and interesting effects. The colors are not glazed inasmuch as they are obtained by the treatment of the clay itself, the same clay so well-known in other Fiske Brick. Architects interested in colored brickwork should investigate this newest addition to the Fiske line.

"Tapestry Granules"

FISKE & COMPANY, INC., also make from the same shale that is used in manufacturing their "Tapestry" Brick, granules for use in covering asphalt products. Many of the principal roofing manufacturers can supply asphalt shingles and siding covered with these granules.

Fiske Service (Since 1864)

Fiske service starts with the order and follows through till the final brick is laid. With large plants and unsurpassed facilities for filling every order on schedule FISKE & COMPANY, INC., offers the architect a welcome relief from delivery worries. You can count on Fiske Brick being on the job when, as and how you want them.

THE FINZER BROS. CLAY CO.

Manufacturers of Finzer Face Brick for Interior and Exterior Use

SUGARCREEK, OHIO

(THE CLAY CITY)

AGENTS IN ALL OF THE PRINCIPAL CITIES OF THE UNITED STATES, EAST OF THE MISSISSIPPI RIVER

Products

"FORESTBLEND" FACE BRICK, a peculiarly distinctive highlighted texture produced in all of nature's charming colors! FINZER FACE BRICK, a complete line of all colors manufactured in Smooth Face, Matt Face, Sand Finish, Salt Glaze and Duotex; GRANDEURS, a new and entirely distinctive product in brick stratification, marvelous in texture, markings and appearance (patent pending).

Forestblend
FINZER FACE BRICK
Trade Mark Registered

Special Advantages

Forestblend and Finzer Face Brick are manufactured in two modern plants located at Sugarcreek, Ohio. The clay and shale deposits of this locality are universally acknowledged for their purity and beauty. Being one of the few plants equipped to mix fire clay and shale, we are enabled to produce colors and shades not possible in many other plants. All brick are carefully graded for color and perfection. Any desired ranges and combinations may be shipped without extra charge.

Textures

Forestblend and Finzer Face Brick are offered in smooth, wire cut matt, Forestblend (rough matt), sand finish, salt glaze and two new textures, Duo-tex and Strati-tex.

Forestblends

The registered name "Forestblend" applies to a peculiar highlighted texture obtained by patented machines. Available in numerous colors and blends—adaptable to any style of architecture. The chart below indicates the description of the various shades and blends.

CHART OF FORESTBLENDS

Colors	Available in	Colors	Available in
Manganese gray	Uniform shade	Light reds	Uniform shade
Manganese gray	Limited variation	Medium reds	Uniform shade
Manganese gray	Wide variation	Dark reds	Uniform shade
Sycamore	Range of light buffs, grays, greens and toasted browns	Variegated reds	Medium to maroon
		Browns, blues	Mixed or separated
		Greens, russets	Range
Golden buffs	Straw color uniform	Green, purple, russet and red polychromes	Mixture
Golden buffs	Straw color slight range		
Warm buffs and browns	Slight range	Light orange	Range
		Dark orange	Range
Warm buffs and browns	Wide range	Orange and green polychromes	Range
Light tangerines	Slight range	Gray greens, toasted greens	Range
Dark tangerines	Slight range		

Above shades can also be furnished in modified texture in quantities of 100,000 and over on special orders.
All Forestblends are rough matt texture.
Finzer buffs and grays—smooth face and matt face.

Note: Any of above colors can be blended together in proportions the architect desires affording a splendid opportunity of designing blends for particular work. Flowing colors are readily worked out.

Finzer Buffs and Grays

Especially interesting ranges in buffs, ivories, ironspots in uniform or mingled grays. The buffs range from light straw through golden to chocolate brown while the gray range, though more limited, includes shades from light pearl to battleship.

CHART OF FINZER BUFFS AND GRAYS

Colors	Available in	Colors	Available in
Clear buffs	Ivory shade smooth	Sienna browns, light and dark olives	Range
Clear buffs	Ivory shade uniform		
Courts buffs	Ivory shade range		
Courts buffs	Ivory and light gray range	Buff hearts with salmon edges	Range
Manganese gray	60 series uniform		
Manganese gray	70 series uniform	Green and orange polychromes	Range
Manganese gray	80 series uniform		
Golden buff	Straw color slight range	Green and light russets	Range

Finzer Salt Glaze

Manufactured of recognized Sugarcreek Clays and especially noted for their uniformly lighter tones.

Special shapes: coves, octagons, bullnose, internal and external, cap mould and base, and sill and joint miters available from stock. Other shapes promptly to order.

CHART OF SALT GLAZED BRICK

Light straw colors	Available in range
Medium light straw colors	Available in range
Dark straw colors	Available in range

Finzer Reds

A complete line of reds ranging from light cherry to deep maroon, wire cut and vertical score textures.

Duo-Tex

A vertical score texture over center of face with smooth ends. Furnished in straw color and a slight range.

Grandeurs

A range of stratified buffs and browns. No two brick alike. A new product designed for decorative purposes. Being used for both exterior and interior work. Furnished glazed or unglazed. See panel on succeeding page.

Capacity and Stocks

Yearly capacity, 67 million brick. Stocks on hand average 10 million to 12 million in 133 colors, shades and textures. Prompt shipments of any amount available on short notice.

Plant Location and Shipping Facilities

Both Finzer plants are located on the line of the Wheeling & Lake Erie Ry. with direct connections to New York Central, Erie, Pennsylvania, Baltimore & Ohio and Nickel Plate railroads.

Samples

Samples of textures and colors will be sent free of charge upon request.

Special Shapes

Bullnose and coves available from stock in many shades; other shapes to order.

Specifications

To insure the use of Finzer Brick, insert the word "Finzer" or "Forestblend" in any place where face brick is called for in the specifications.

Complete Color Catalogue

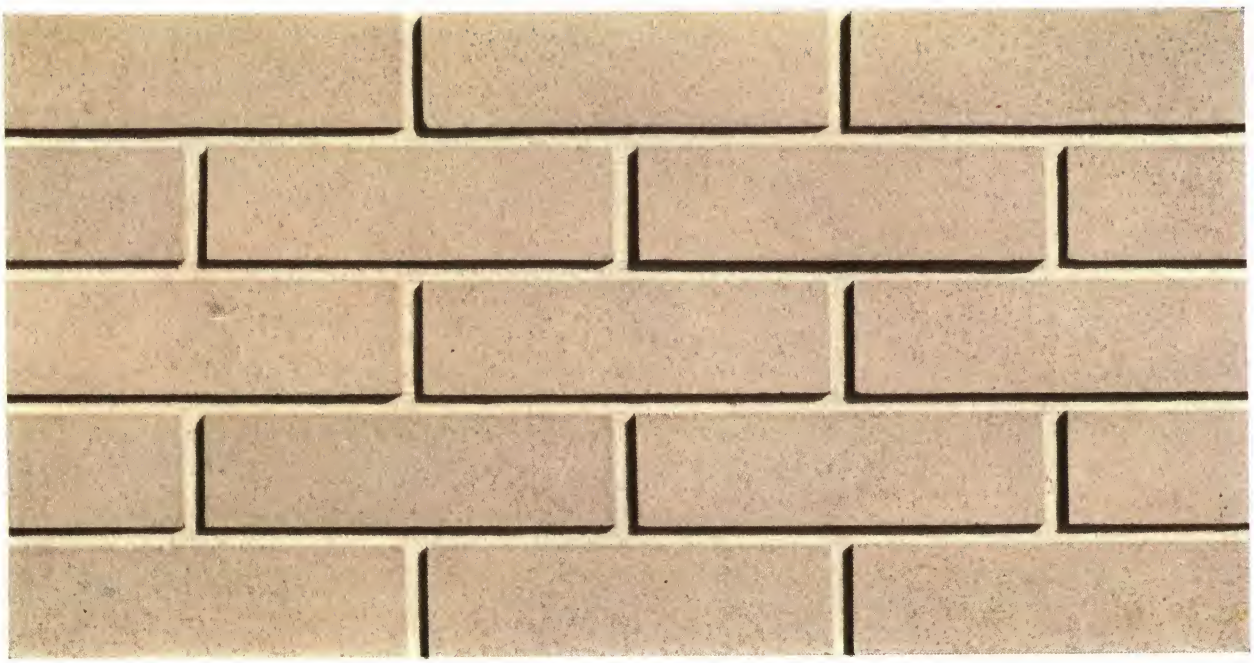
Contains full color reproductions of all shades and ranges with faithful details of texture and full information regarding the lines. Sent promptly on request.

Recent Representative Work

LOCATION	BUILDING	ARCHITECT
Warner, N. Y.	School	C. W. Clark
Ithaca, N. Y.	Taylor Law Memorial, Cornell University (interior)	Jackson, Robertson and Adams
Scranton, Pa.	Technical High School	Albert Ward
Wilmington, Del.	DuPont Building	DuPont Engineering Co.
Pittsburgh, Pa.	Venetian Garden Apartments	Anthony F. Jordan
Elmira, N. Y.	High School	Pierce & Bickford
Springdale, Pa.	Schools	John H. Phillips
Bellefontaine, Ohio	High School	Walker & Norwich
Galveston, Tex.	Santa Fe Railway Building	E. A. Harrison and W. J. Smith
Sugarcreek, Ohio	Sugarcreek-Shanesville High School	Chas. J. Marr
Bluffton, Ohio	High School	Thos. B. McLaughlin & Associates

A FEW FINZER AND FORESTBLEND SHADES AND RANGES

Shown here are but a few of the Finzer and Forestblend shades and ranges. The variety of colors offered, however, is so wide that the number of range combinations is almost limitless, affording the architect suitable colors and variations for any structure.

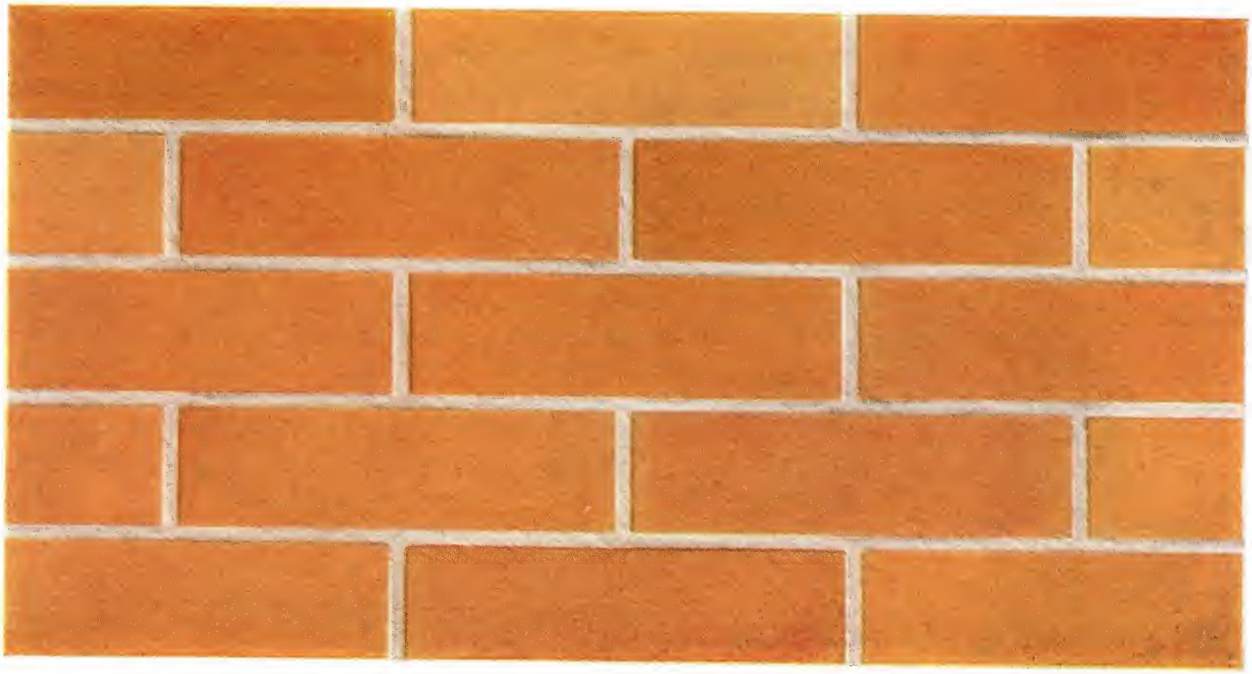


FINZER SHADE 60

A uniform shade of smooth warm gray displaying an even sprinkling of minute manganese spots over the entire surface. A splendid selection for institutions and public buildings.

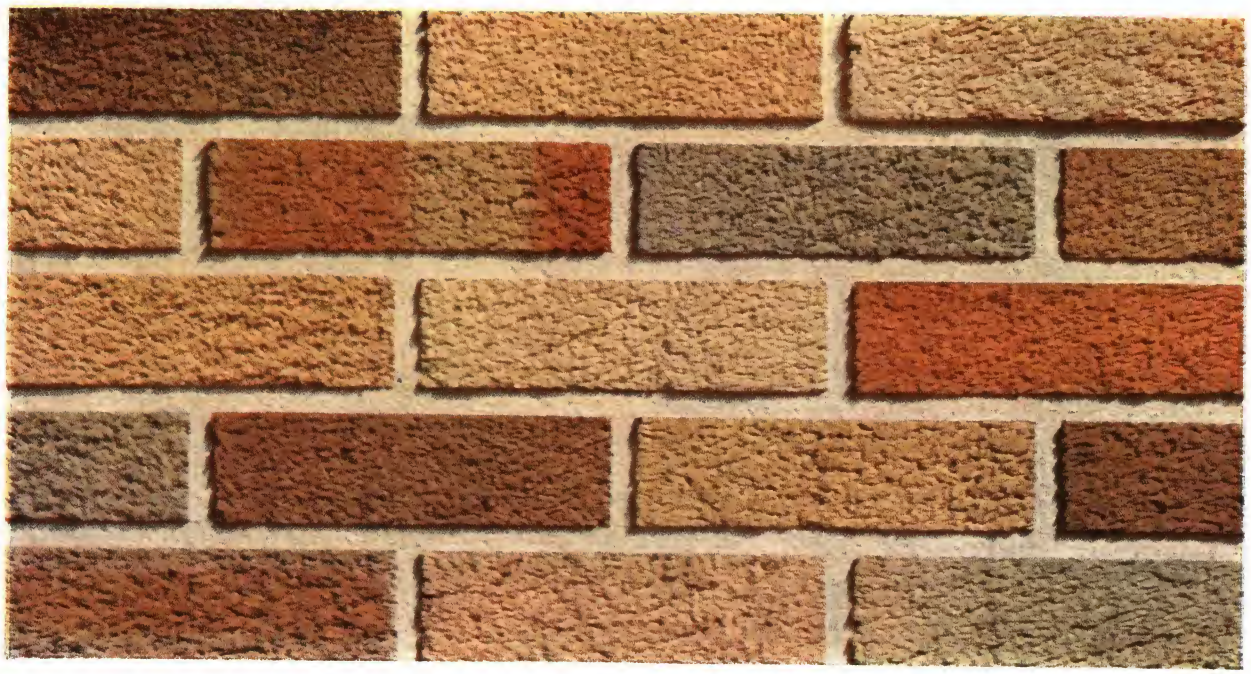
FINZER SHADE 330

A uniform shade of ivory in smooth face. This shade is also furnished in courts. It shows by test 85% light reflections with a water absorption of approximately 5% in accordance with Ohio State University experimental tests. Specified by architects largely for commercial buildings and large structures.



FINZER SALT GLAZE RANGE 350

A notable feature of this range is its unusually light coloring, making it especially useful for those locations where light reflection is an important factor. Available also in medium and dark ranges.

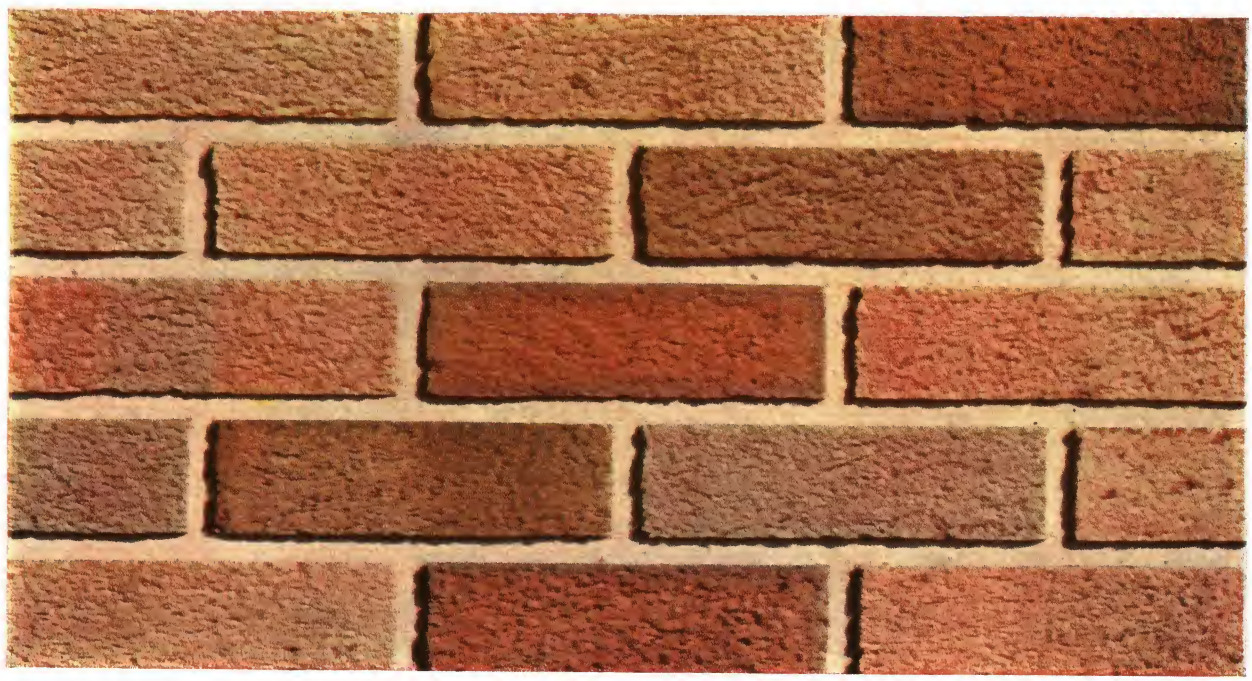


FORESTBLEND RANGE 500

A buff range in Forestblend texture including browns, greens, buffs and orange polychromes. A number of variations are optional by changing the color proportions. A brick well adapted to general use in apartment, school and residence construction.

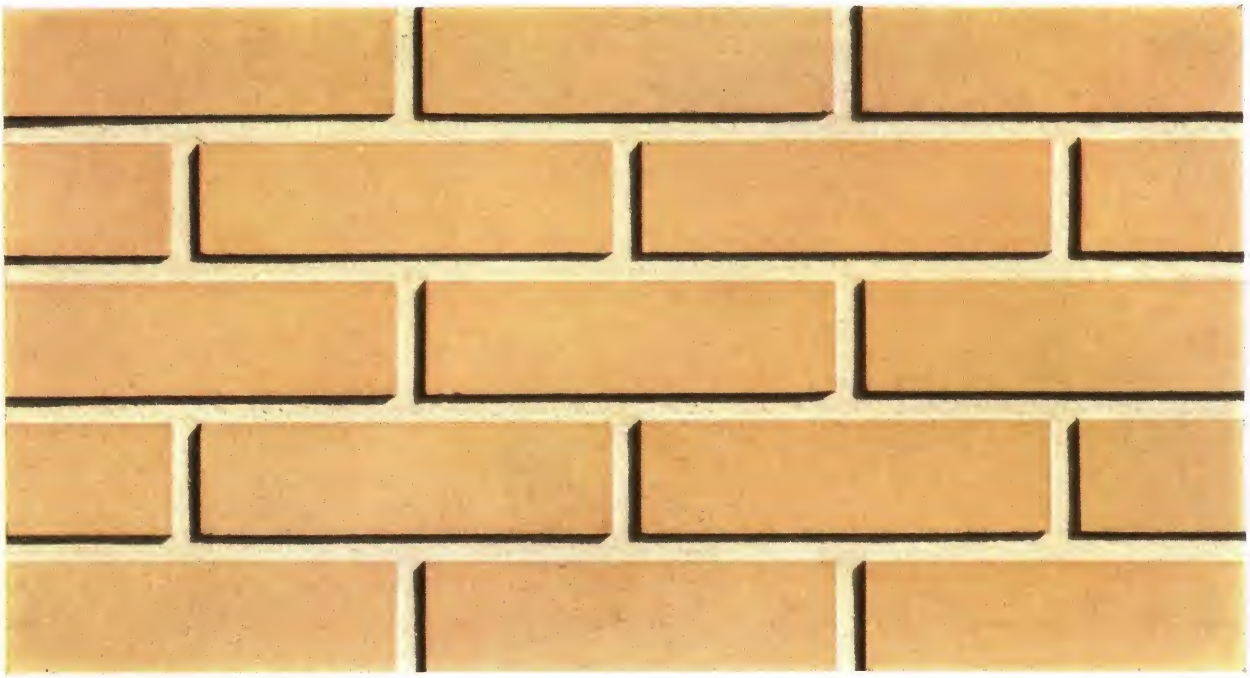
GRANDEUR

A new achievement in brick beauty. No two bricks are alike. This range is finding wide acceptance among architects for interior decorative work such as wainscoating, mantels, etc. Available with or without salt glaze. Especially adaptable also for exterior work, particularly with half timber construction.



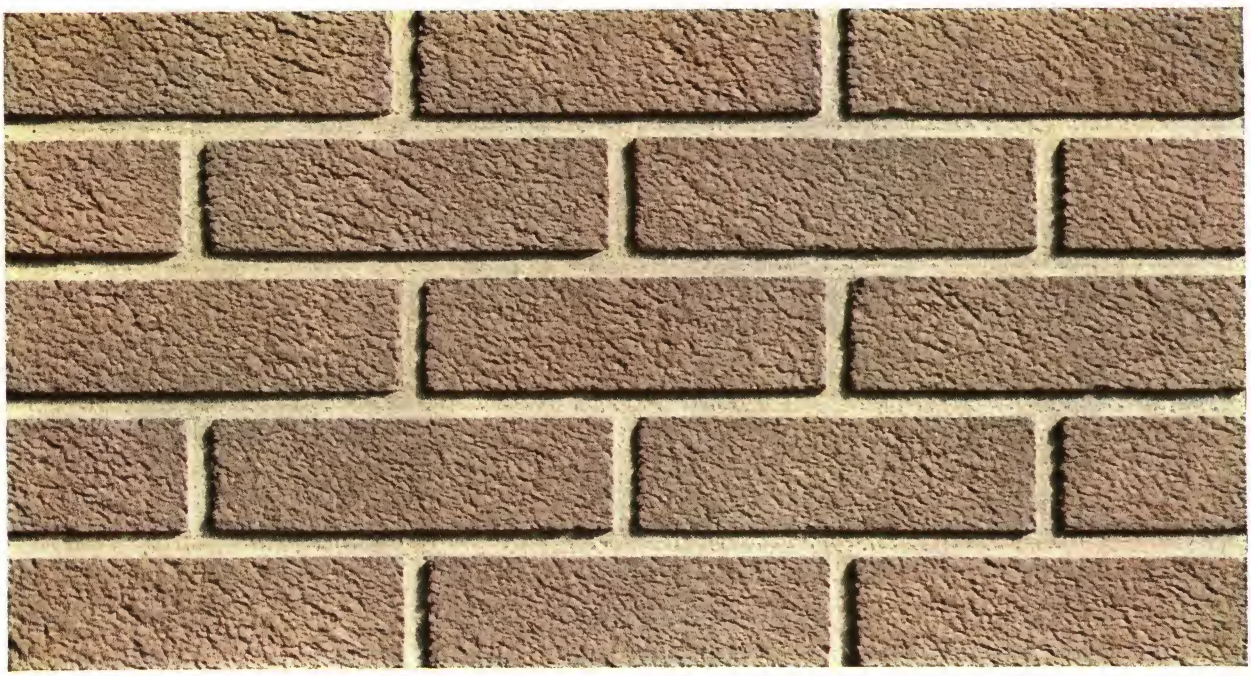
FORESTBLEND RANGE 455F—Sycamore Barks

A buff range including gray-greens, buffs, toasted browns, salmons and salmon-green polychromes. Most suitable for Spanish and Mediterranean Architectural treatments.



FINZER SHADE 380

A uniform shade of golden buff in smooth face. A slight range is possible by the addition of lighter or darker brick in the proportions desired. In specifying the range, the shade No. 381 is used. This shade has been very popular where a warmer tone than ivory was desired.



FORESTBLEND SHADE 400

Consists of manganese grays, rough matt texture, in uniform shade. If a varied range is desired it can be readily accomplished by the addition of lighter or darker grays. Shade 400 is particularly adaptable to church, library and theological work.

ESTABLISHED 1893

HANLEY COMPANY

Tunnel Kiln Face Brick

BRADFORD, PA.

NEW YORK OFFICE: 565 Fifth Avenue BOSTON OFFICE: 109 Allerton Road (Newton Highlands)

PLANTS: BRADFORD, PA., SUMMERVILLE, PA.

SALES REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

All shades and textures of FACE BRICK in red, gray, brown, golden, tangerine, mottled gray, white and glaze in any color combination desired; COURT BRICK in pure white, glazed and buff; IMPORTED FACE BRICK; HANLEY WHITE GLAZED BRICK, ENAMELED BRICK and LIMESTONE GRAY FACE BRICK.

TRADE-MARK

For our pages on Floor Tile, Roofing Tile, Promenade Tile, Packing House Floor Brick and Acidproof Brick, refer to Manufacturers' Index.

Hanley Face Brick—Available in All Colors and Finishes

"Bradford Reds"—(a) Even shades in deep cherry red to a light red.

(b) Rich range of colors including greens, browns, tans, blues and reds. Also "Russets," a new blend containing ⅔ browns, tans, reddish tans and ⅓ red and black.

Hanley Buffs, Grays, Whites, Browns, Goldens and Glazed Brick—(a) Even shades in buff, gray, white, cream, brown, tangerine and golden.

(b) Blends of practically any percentage of these colors which are desired to fit the architect's scheme for color, available in wirecut or dry press.

Made in what is believed to be the largest and most modern tunnel kiln face brick plant in the world, these brick approach perfection in face brick.

Limestone Gray Face Brick

This brick (shade 119K) has been developed to meet the demand for a soft hue of gray to blend with gray limestone. The price is low and the color is unique in its appeal.

Imported Holland Face Brick

These handmade face bricks have been used by the most prominent residential architects in the country and if used properly give a beautiful effect. They combine the antique features of a handmade brick with the soft gentle blending hues found only in European clays of yellow, orange, tan and red, in any color proportion desired.

Glazed and Enameled Products

The usage of glazed brick in all colors is growing on buildings of all size.

Office Buildings

Office buildings of the best class in New York, N. Y., now are being built largely of white glazed brick in order to insure a bright clean appearance permanently.

Glazed brick in a vast assortment of colors are being used for trim and decoration, such as spandrels and piers and band courses.

Graduated color schemes and fine shadings, possible only with glazed brick, are all being resorted to in order to make commercial buildings more attractive and washable.

Light Reflection

It has been established in tests run by lighting manufacturers, that a white glazed product, used on the exterior of a building, increases the light at street levels as much as 200%, compared with light conditions when darker, soilable materials are used. This factor has aided greatly in giving daylight to lower floors of buildings in congested sections.

Remodeling with Glazed Brick

Many old dark red brick store fronts can be brightened up like new by simply veneering with glazed brick.

Cost of glazed brick is approximately ⅓ more than face brick and ½ the cost of stone laid in the wall.

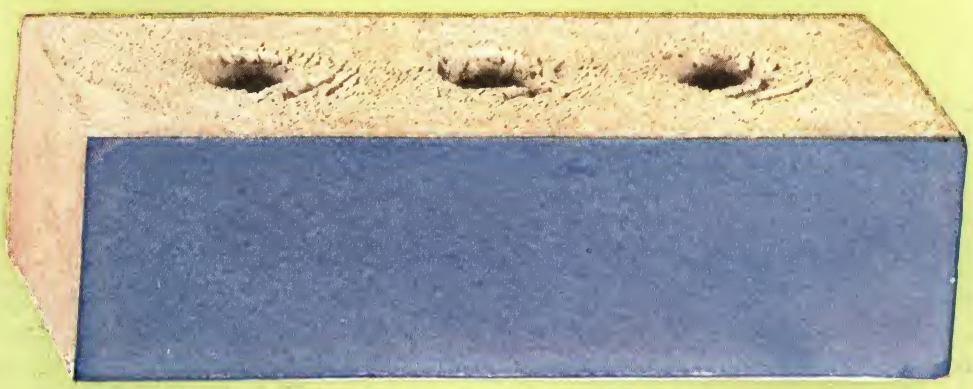
Territory Served

Due to the distinctiveness of Hanley Products they are shipped over a wide territory; such products as Hanley Promenade Tile, Glazed Brick, Gray Face Brick and Bradford Reds being sold regularly in 32 States east of the Rockies.

PURE WHITE GLAZE

MOTTLED TAN GLAZE. Available in either a light or dark tan.

PURE WHITE GLAZE WITH BLACK SPECK. Available in any size speck desired.



AZURE BLUE GLAZE

THE MEDAL BRICK & TILE CO.

Builders Exchange Building, CLEVELAND, OHIO

PLANTS AT WOOSTER, MALVERN AND CARROLLTON, OHIO

DEALERS IN ALL PRINCIPAL CITIES

Products

Medal Face Brick in a variety of colorings and surface textures, including side cut mats, end cut mats, vertical die cut and sanded textures. Available in straight shades or any specified mingling of shades. (All Medal Brick are sorted on coming from the kiln into piles of like color and re-combined in definite color mingles according to specification.)

Agecrost Oldstyle Brick, for reproducing the effect of antiquity found in classic models of European and Colonial buildings. (A United States patent has been granted for originality and merit.)

Agecrost Oldstyle Medal Brick

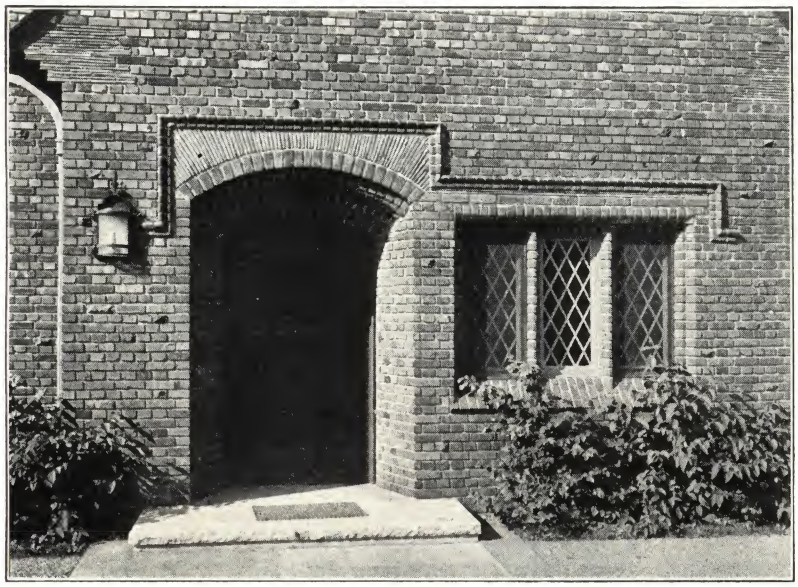
This brick has the general aspect of an early, handmade brick plus the effect of long weathering. The influence of its surface treatment upon color is to soften and harmonize the brilliant colorings of the Medal Range and to increase their richness. The surface is neither acutely smooth nor systematically roughened. Minor irregularities of outline are preserved without extremity or affectation.

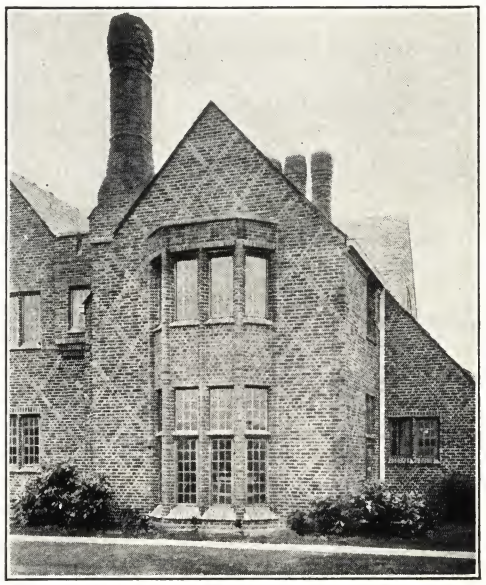
Squared or Beveled Edges—Agecrost brick are furnished with squared edges, or with edges irregularly beveled or rounded, thus increasing the scope of effects obtainable by different joint treatments. Perhaps the most prized advantage of the beveled brick is the appearance of a smaller face when full mortared, without departure from standard dimensions. Thus a mixture of squared and beveled brick, full mortared, gives the effect of pleasing variety of size and the appearance of undulation in the mortar line, without disturbing actual bedding levels.

Agecrost Window Brick

These brick comprise more than thirty specials from which to erect window openings for metal casement windows or double hung windows in harmony with the general exterior treatment of the building. The ⅜-in. flange against which the window frame is set gives added security and complete weather protection around the window.

Bulletin and blue prints with full details of single, double and bay windows showing suggested application of trim for veneer and solid wall construction for casement or double hung frames, will be mailed to architects on request.





Co-operative Service

Factory representatives in all territories assist Medal dealers to solve special problems. Name of nearest dealer furnished on request.

Illustrations show Label Mould Window Brick, and a few of the Special Shapes we have executed in Clay

Architectural details will be forwarded upon request

HYDRAULIC-PRESS BRICK COMPANY

Manufacturers and Distributors of Hy-tex Brick

ST. LOUIS, MO.

BRANCH OFFICES, EXHIBIT ROOMS AND DISTRIBUTING CENTERS

BALTIMORE, MD., Munsey Building
CHICAGO, ILL., Builders' Building
DAVENPORT, IOWA, Putnam Building
DUBOIS, PA., Deposit National Bank Building
INDIANAPOLIS, IND., Board of Trade Building
KANSAS CITY, MO., Rialto Building
OMAHA, NEB., 41st and Lake Streets
PEORIA, ILL., Lehmann Building
PHILADELPHIA, PA., Otis Building
ROSEVILLE, OHIO
SOUTH PARK, OHIO
WASHINGTON, D. C., Colorado Building
NEW YORK, N. Y., Fredenburg & Lounsbury, Representatives, Architects Building, 101 Park Avenue

AUTHORIZED DISTRIBUTORS IN PRINCIPAL CITIES

Hy-tex Brick

The Standard of Quality in Brick
TRADE-MARK

Products

The HY-TEX BRICK line embraces: Face Brick, Enamel Brick, Salt Glaze Brick, Vitricote Brick, Equitable Brick, Cowancote Brick, Paving Brick, Common Brick and Hollow Building Tile, Swimming Pools and Brick Mosaics.

Hy-tex Face Brick

The Hy-tex color range runs in face brick from the lightest colored creams, grays and buffs to the darkest reds and browns in smooth, semi-smooth and rough textures. It offers literally hundreds of various tones in the gray, buff and red basal colors.

No matter what your requirements, whether for exterior or interior use, you will find in the Hy-tex line just the brick you want.

Specialties

Hy-tex Enamel Brick—Hy-tex Enamel Brick are unexcelled in quality and durability by any similar brick of domestic or foreign manufacture.

Hy-tex Enamel Brick in the White and Ivory shades are absolutely opaque. Hy-tex Enamels will not craze, peel or discolor under the severest climatic tests, as proved by the experience of exacting architects in all parts of the country.

They are made in White, Ivory, Green, Brown, Blue, Jade, Black, Transparent Speckled Buff, Transparent Speckled Brown, and are used extensively for facing large office buildings, theaters, stores, etc., as well as for hospitals, corridors, schools, gymnasiums, laundries, restaurants, bake ovens, garages, engine rooms, outdoor and indoor swimming pools, etc.

Hy-tex Enamel Court Brick—These bricks have slight surface defects which are not noticeable in courts or areas. Served in the same range of colors as Hy-tex Enamels and have been used in many large buildings with complete satisfaction.

Hy-tex Salt Glaze Brick—Hy-tex Salt Glaze Brick range in colors from light straw to golden browns, and ivory, green and black. These are widely used where light reflection and bright, clean, sanitary surfaces are desired.

The cost of Hy-tex Salt Glaze Brick closely approximates that of plaster and painted common brick, while its maintenance cost is less. Double brick 4⅞x8x3⅞ ins. are available. Samples on request.

Hy-tex Equitable Brick—Have been used extensively for over fifteen years, and the use of these bricks in the Chrysler Building, the New York Hospital and Cornell Medical College Group, New York, indicates our capacity to serve adequately the architects in all monumental work of this character.

They are made in White, Speckled White, Cream, Gray and Black shades, and present a smooth impervious surface, and wash with the rain to their original clean appearance; and do not craze, scale or discolor under severest climatic conditions. Suitable for both exterior and interior requirements.

Hy-tex Vitricote Brick—A glazed product in smooth and rippled textures in the speckled white, limestone, cream, green and black shades. They are used as exterior and interior brick for office, mercantile and industrial buildings; for corridors, stairways, vestibules, wainscots, etc., in schools, auditoriums, engine rooms, garages, etc. An excellent example of speckled white vitricote field with black special brick spandrels is found in the new Bryant Building in Kansas City, Missouri. Samples on request.

Hy-tex Cowancote Brick—A new glazed product, satin finish, served in White and Speckled White shades. An excellent brick for use where bright, clean, sanitary exterior or interior surfaces are desirable.

Hy-tex Enamel Swimming Pools

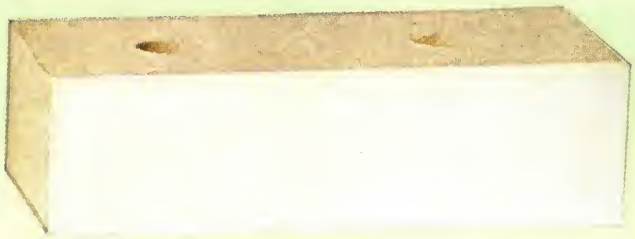
Simplicity of design and strength of construction in the use of Hy-tex Enamels, with the addition of all details—such as scum gutter, life rail, mosaic distance markers and drains—make them a perfect installation. Write for booklet.

Facilities

For over half a century the HYDRAULIC-PRESS BRICK COMPANY have been building the reputation which Hy-tex products enjoy today. During that time the Hy-tex organization has grown from one to twenty-two plants, scattered through the eight great clay-producing states. Branch office and agency distribution insures prompt and efficient service in all parts of the country.

Literature

This Company has issued booklets on Hy-tex Brick, Salt Glaze Brick, Hy-tex Enamel Brick and Equitable Brick; Brick Scales and Tables, a ready and convenient method of determining the number of courses and joints in all brickwork; Color Cards, and other material. For any of the above, apply to nearest branch office.



Color No. 100

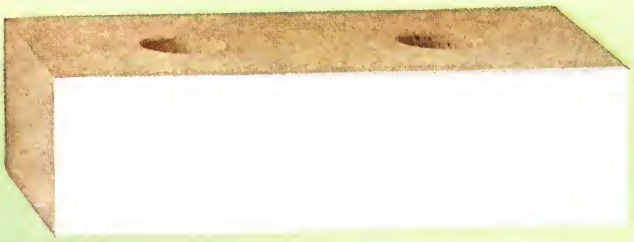
Color No. 128

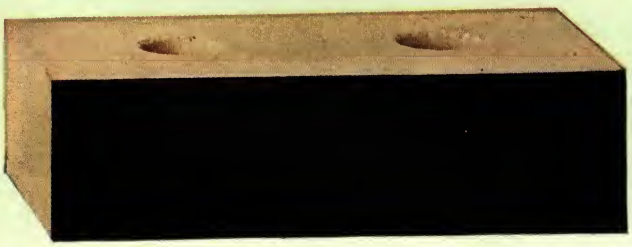
HY-TEX EQUITABLE BRICK

Light Golden, Green

Ivory, Dark Golden

HY-TEX SALT GLAZE BRICK





White, Brown, Black

Transparent Buff, Green, Blue

HY-TEX ENAMEL BRICK

"A COMPOSITION OF HY-TEX SERVICE"

No. 1–Bank of Manhattan
H. Craig Severance, Architect
Hy-tex No. 178 Cream—Dry Press
Hy-tex No. 81-2-3 Gray Manganese Spot, trim

No. 2–Sherry Netherlands Hotel
Schultz & Weaver, Architects
Hy-tex No. 198 Buff Manganese Spot, Dry Press

No. 3–No. 2 Park Avenue Building
Buchman & Kahn, Architects
Hy-tex No. 48–84 Gray Manganese Spot, Dry Press

No. 4–New York Hospital, Cornell Medical College Association
Coolidge, Shepley, Bulfinch & Abbott, Architects
Hy-tex Equitables No. 110-120-130 Range

No. 5–Pennsylvania Power & Light Co. Building
Corbett, Harrison & MacMurray, Architects
Hy-tex Cowan Full Range Semi-Smooth No. 210-48 Range

No. 6–Savoy Plaza Notel
McKim, Mead & White, Architects
Hy-tex Equitables No. 100 Shade

No. 7–18th Street New York Telephone Building
Voorhees, Gmelin & Walker, Architects
Hy-tex Cowan Semi-Smooth No. 230-40-42 Range

No. 8–Chrysler Building
William Van Alen, Architect
Hy-tex Equitables No. 128, trim Black Enamels

HYDRAULIC-PRESS BRICK COMPANY

THE METROPOLITAN PAVING BRICK CO.

CANTON, OHIO

NEW YORK OFFICES: 41 EAST 42nd STREET

PRODUCTS

Architectural Face Brick; Molded Brick Shapes; Structural Clay Tile; Trickling Filter Flooring; Vitrified Paving Brick; Acid Brick; Floor Brick.

BY INVITATION MEMBER OF

NEW YORK, U.S.A.

QUALITY

Metro Architectural Face Brick is being used with continuous satisfaction by leading architects to obtain the distinctive beauty portrayed in the original drawings. Metro Brick is made of the finest raw materials, carefully fired and graded. It is in every sense a quality product.

TEXTURES

Metro Face Brick may be had in the following textures: Mat-Tex, Ver-Tex, Royal Rug-Tex, Clinker, Smooth, Semi-Smooth, and Sand Mold Finish.

COLORS

The facilities of Metropolitan allow the architect almost unlimited freedom in his choice of colors. In stock, are a wide variety of face brick styles, colors and shades. When distinctive and unusual effects are desired, Metropolitan will work with the architect in developing new colors and combinations.

Large deposits of superior raw materials, careful firing and expert selection of shades guarantee a permanent supply of Metro Face Brick in the exact shades and ranges ordered. Any order of Metro Face Brick can be duplicated.

MOLDED BRICK SHAPES

Molded shapes are steadily increasing in popularity. Metropolitan offers to architects a service which guarantees the lasting reproduction in brick of the colors, shade and design embodied in the architect's drawing. Shapes can be produced in practically any color, size or quantity.

PRODUCTION FACILITIES

Eight plants, located at Canton, Ohio; Cleveland, Ohio; Minerva, Ohio; Bessemer, Pa.; and Olean, N. Y.; are engaged in manufacturing Metropolitan products. Their capacity, one million brick a day, is the world's largest. Here is your guarantee of prompt delivery of any quantity of brick.

SAMPLES

Samples and a portfolio of plates illustrating the textures and colors of Metro Face Brick will be sent on request.

REFERENCES:

BUILDING	ARCHITECT
Marshall Field Housing Project, Chicago, Ill.	Andrew J. Thomas New York City
Apartment Building, 1530 N. State Street, Chicago, Ill.	Granger and Bollenbacher, Chicago, Ill.
Home for the Aged, Syracuse, N. Y.	Randall and Vedder, Syracuse, N. Y.
Chatelaine Towers, Chicago, Ill.	Roy F. France,, Inc. Miami Beach, Florida
Hotel for Women, Gramercy Park, New York City.	Murgatroyad nd Ogden, New York City
Morrell Street Power House, Detroit, Mich.	Smith, Hinchman and Grylls, Detroit, Mich.
London Terrace Apartments, New York City.	Farrar and Watmough, New York City
Barbizon Hotel, New York City.	Murgatroyd and Ogden, New York City.
Abeyton Realty Development, Cleveland, Ohio	Andrew J. Thomas, New York City.
Teaneck High School, Teaneck, N. J.	Hacker and Hacker, Fort Lee, N. J.
67th & 68th St. Apartment. New York City.	Andrew J. Thomas, New York City.
Oberlin College Bldg., Oberlin, Ohio	Cass Gilbert, New York City.
Allerton Hotel, Cleveland, Ohio	Murgatroyd and Ogden, New York City.
Shaker Heights High School, Cleveland, Ohio	Hubbell and Benes Co. Cleveland, Ohio
Alden Park Manor, Germantown, Pa.	Kenneth M. deVoe Detroit, Mich.
The Steuben Club New York City	Bowden and Russell, New York City.
Chancellor Hall (Hotel) Philadelphia, Pa.	Arthur W. Hall, Philadelphia, Pa.
Toledo University Building Toledo, Ohio.	Mills, Rhines, Bellman and Nordhoff, Toledo, Ohio.

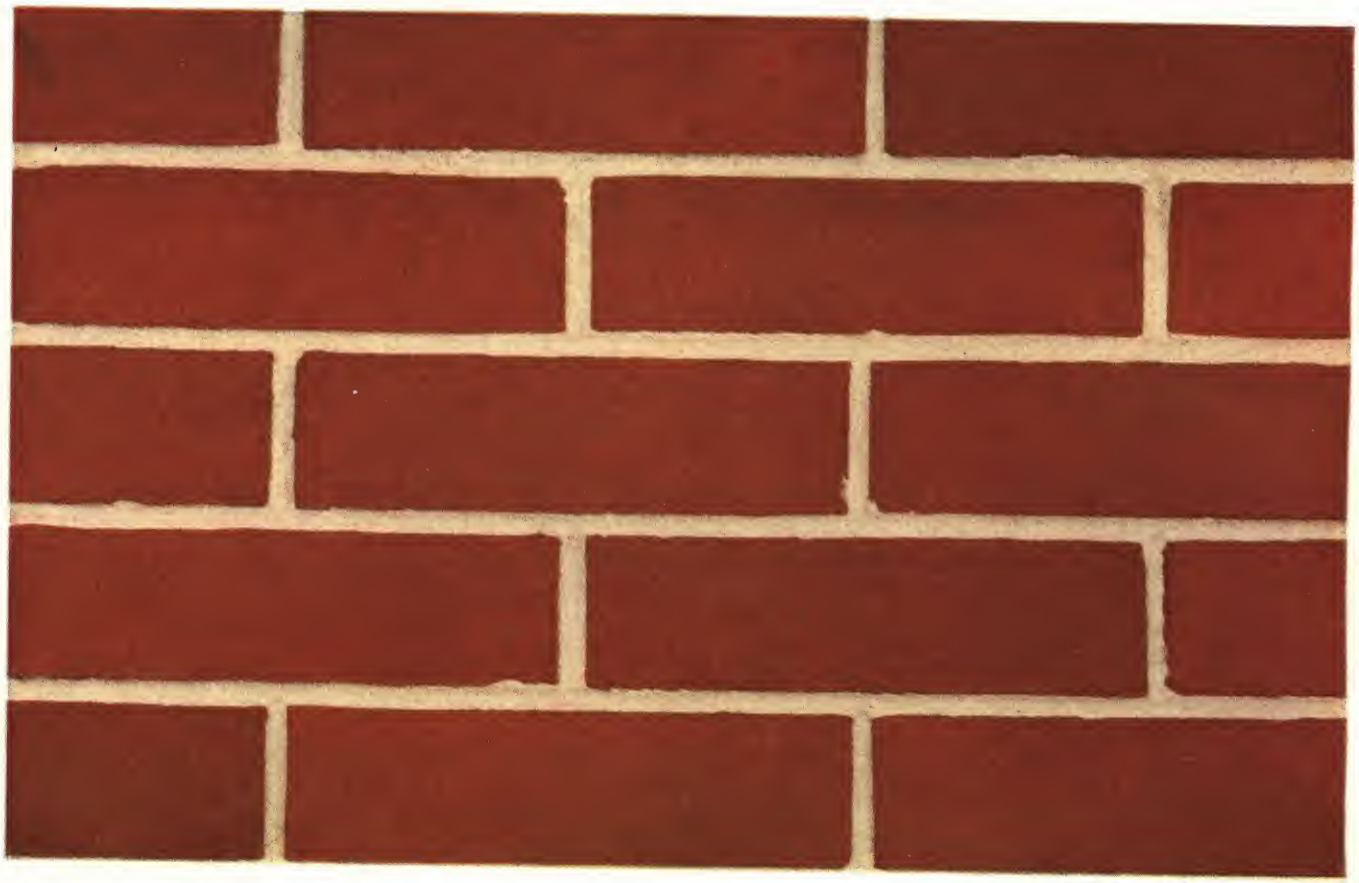
METRO-GEORGIAN FULL RANGE

ROYAL RUG-TEX No. 414-F

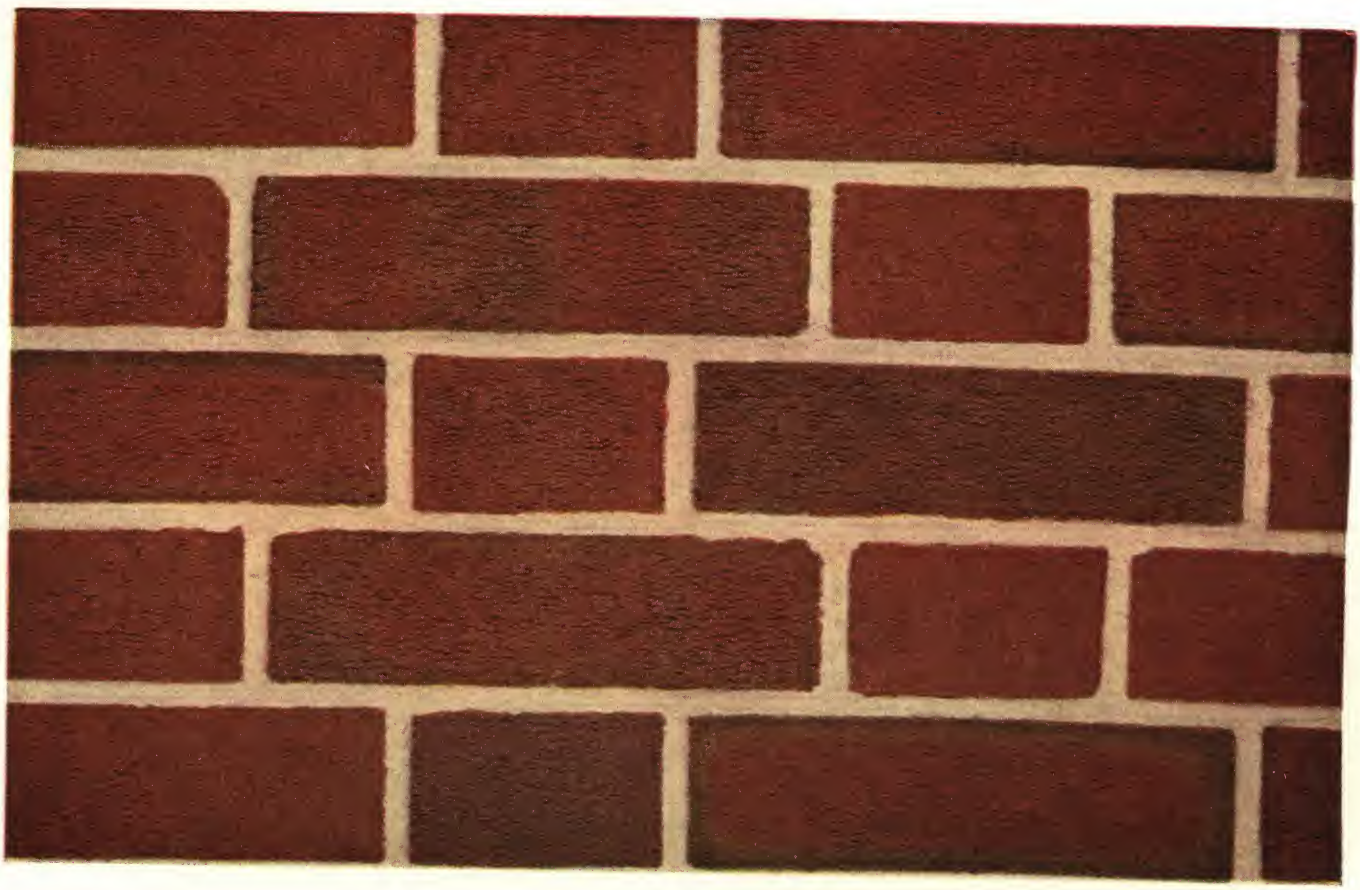
METRO-GEORGIAN FULL RANGE

HEAVILY SANDED YELLOWSTONE

TAVERN No. 3 BLEND



METRO SMOOTH COLONIAL No's. 230-F—240-F



METRO MAT-TEX No's. 1130-F—1170-F

OLD VIRGINIA BRICK COMPANY

Makers of Real Old Virginy Mould-made and Hand Made Face Brick

KILNS AT
SALEM, VA.

Cavaliers

A mould-made age-toned face brick in standard size.

Jeffersons

Made of the same material and in the same mould-made way as the Cavaliers, differing only in being half inch higher.

This is the same size brick used by Jefferson for Monticello. The headers have a squarish look, making the stretchers look shorter.

The laid up result is a wall giving less mortar joints, and an appearance of decided sturdiness.

Five thousand bricks lay up the same as six thousand of standard size.

F. F. Vees

A standard size, glorified, so-called clinker brick.

Has the characteristic bulges, crazes and seams of clinkers, but a wider variety of surfaces and range of colors.

They are not accidents or dump pile discards, but a regular product—one that, by its very nature, can be turned out in only limited quantities, requiring ordering well in advance of needs.

Hand Mades

Truly hand made in the old mule-operated pug mill and hand-filled moulds. Made in either standard or Jefferson size.

Hand-made Cherry Mould in Which Old Virginia Brick Are Made

Facts in General

The outstanding feature of both the Cavaliers and the Jeffersons is the age-old effect they give, both as to color and texture. This is caused by the following four things:

(1) The character of the basic material mined directly from the Blue Ridge Mountains.

(2) The special sand employed in the moulds.

(3) The cherry wood hand-made moulds used.

(4) The three kinds of fuel used in the burning, combined with uniform control of temperatures.

The combination of these four produces a brick leaning towards the rich browns and reds. One having a wonderful gamut in soft time tonings. The mould-made way of shaping them gives just the right amount of natural off-shapeness and softening of edges.

Brick Kit

Just so you can see in actuality how a wall of Cavaliers or Jeffersons looks, send for our Brick Kit.

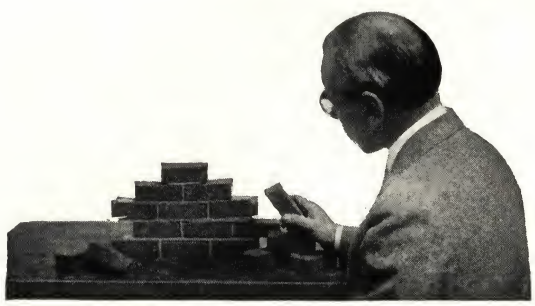
It is a kit of quarter size, half dimension bricks, with compo board strips for the mortar. With them you can literally lay up a wall right on your desk or table and get actual effects. In requesting one of these complimentary Brick Kits, kindly state whether you want them in the Cavalier or Jefferson size miniatures.

Shipments

All OLD VIRGINIA BRICK COMPANY products are shipped directly from our own group of kilns at Salem, Virginia, which is about six miles from Roanoke.

Standard Header and Stretcher, the Proportionate Size Used for the Cavaliers

Jefferson Bricks Are Half an Inch Higher Than the Regular Standard Size



The Brick Kit Brings You Miniature Quarter Size Bricks So You Can See Just the Effect a Wall of Them Gives

PATERSON FIRE BRICK COMPANY

(FORMERLY PATERSON CLAY PRODUCTS CO., INCORPORATED 1908)

OFFICE AND FACTORY
CLEARFIELD, PA.

AUTHORIZED DISTRIBUTERS IN PRINCIPAL CITIES

Products

A complete line of light FACE BRICK from Pearl Grays matching limestone to very warm tones of gray; from a uniform shade of Buff to Dark Goldens; Salt Glaze Brick and Salt Glaze Double Units.

Shipping Facilities

Shipments are made direct from Clearfield via the Buffalo, Rochester & Pittsburgh Ry. Co. or the New York Central R. R. or the Pennsylvania R. R. and connecting lines, and we enjoy three to four-day freight service both to New York City and to Chicago.

Capacity and Perspective

Our annual plant capacity is 15,000,000 brick and we carry an average of 4,000,000 brick in stock under cover. More than one hundred years' supply of both clay and coal with the management in love with its work assures continuity of product. The principal office is at the plant. The plant is of moderate size, efficiently operated and complete in every respect.

Paterson Pearl Gray

No. 50 shades A-B is a smooth surface face brick pearl gray in color developed by us to meet the demand for a brick to match limestone. This brick is decidedly gray with bluish cast and no trace of buff.

Cathedral Gray

No. 30 Ag is a dark gray smooth brick—warm and sombre with brownish tinge—uniform in color.

New Yorkers

No. 70 A-B is a gray smooth brick with manganese background—a decidedly true gray—neither light nor dark. Other gray shades—No. 40, No. 60.

St. Augustine Church, Rochester, N. Y.
ARNOLD & STERN, Architects
A. FREDERICHS & SONS CO., Contractors
Cathedral gray brick used for exterior and interior

Buff Brick of Highest Quality

For our buff brick nature has favored us with a unique clay. This clay vitrifies at the *buff* burning temperature and burns to a beautiful light buff color—no grayish tones—and is soft, warm and very uniform in shade. We duplicate the color year in and year out.

These brick, being vitrified, keep clean and nevertheless have an affinity for mortar and knit quickly and permanently with the mortar joint. This is a most important consideration for dry walls and makes these brick equally desirable for exterior or interior use. Brick of this clay are the Buff, Goldens, Courts, Salt Glaze and Cathedral Gray.

No. 20 Ag is a smooth surface brick of uniform light buff color—soft, warm, cheerful; used very extensively for interiors. Undoubtedly among the best in smooth buff brick.

No. 21ABCD (Court Brick). Walls of these brick keep clean so well, being vitrified, that over a period of years the percentage of light reflected is very high, and at all times they present a soft and pleasing appearance.

Harmonious Ranges

Flashing brick with coal in down-draft kilns is the ideal method of producing harmonious ranges in face brick. The colors so produced are live, permanent, non-fading and blended together by the very essential intermediate shades that can be secured only by flashing. This method we use and the following are some of our standard ranges:

No. 26 Golden Side-cut; No. 28 Golden End-cut; No. 66 Gray Side-cut; No. 68 Gray End-cut; No. 29 "Spanish Missions," a very desirable smooth pink range. Other ranges available.

Salt Glaze Brick

Paterson Salt Glaze Brick are made with our selected buff burning clay. The glaze forms an integral part of the brick and does not scale or peel—is moisture, dust and ink proof. These brick are served in a light tan range, dark range and chocolate trim. The body of these brick is burned hard before glazing, making it a perfect load bearing unit, and the brick being of the same clay as No. 20 Ag (described above) knits perfectly with the mortar joint, making moistureproof and sanitary walls. All standard and special shapes available.

Salt Glaze Double Unit—A new product designed to lessen the cost of glazed walls. The double unit laid in the wall is two-brick and a mortar joint high and 8 ins. long and also standard depth. Standard salt glaze shapes can be and are used with these double units. Double Unit shapes also available.

SAYRE & FISHER BRICK COMPANY

ESTABLISHED 1851

Manufacturers of Burnt Clay Products

SAYREVILLE, N. J.

BRANCH OFFICES

NEW YORK, N. Y., 101 Park Avenue

NEWARK, N. J., Jas. R. Sayre, Jr. & Co. PHILADELPHIA, PA., Architects' Building

REPRESENTATIVES IN ALL PRINCIPAL CITIES

True Colonial Red Face Brick

We manufacture many shapes of red face brick; moulded, repressed and wire cut; burnt in both updraft and downdraft kilns.

They are distinctive in range of color and texture and are sold under the S & F brand names given below.

The physical characteristics are as follows:

	Updraft repressed	Downdraft repressed	Moulded face	Wire cut
Size, in.	8 x3½x2⅜ 8¼x3⅝x2¼	7⅞x3¼x2⅛ 8 x3½x2¼	7⅞x3⅞x2⅛ 8⅛x3½x2¼	8 x3½x2⅛ 8⅜x3⅝x2¼
*Porosity	9.3%-15%	7.37%-15%	9.73%-18%	7%-13%
Weight, lbs.	4	4	4	4
Crushing strength, lbs.	2129	2987	2231	7000

*Low porosities refer to selected grades, highest, to building run.

Brand Names of Sayre & Fisher Red Face Brick

Updraft Repressed

Pilgrim—Selected for uniform color, size and arrises.
Institute—Includes all of selected grades and range of color.
Betsy Ross—Clinkers, rough benches, No. 1 Middles for rustic wall.
Clinker Face—Dark in color.

Downdraft Repressed

Plymouth—Selected for uniform color, size and arrises.
University—Wide color range.
S & B—Selected, narrow color range.
Black End Headers—For Flemish bond.

Moulded Face

Imperial—Selected for color and quality.
Academy—Rough, hard, wide color range.
Clinker Face—Dark in color.
Black End Headers—For Flemish bond.
Special Colonial—A mixture from the other grades may be varied as desired.

Wire Cut

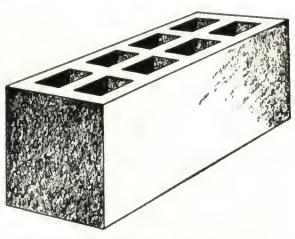
Pioneer—Selected for color and quality.
College—Wide variation in color, some variation in size.
Red Persian—Rough texture.

All Classes

Building Run—Can be supplied in all the above classes.

Load Bearing Clay Block

These heavy duty clay blocks provide a construction stronger than ordinary 8-in. solid brick wall, or a 12-in. cement or cinder block, with a 30% to 54% saving in space, respectively. Size of large block is 12x5½x5 ins.; weight 16 lbs.; crushing strength 4000 lbs. per sq. in. Clay blocks are also made in 8x8x5-in. size to conform to Building Code requirements for 8-in. walls, single block in thickness.



Load Bearing Block

Face Brick

We are manufacturers of face brick of many kinds and have furnished face brick for many of the most prominent buildings in New York City, among which are:

500 Fifth Avenue—Slip Face Brick
Medical Center Buildings—Light Gray
Lincoln Building—Mottled Gray
Pershing Square Building—Slip Face
Equitable Building—Mottled Gray

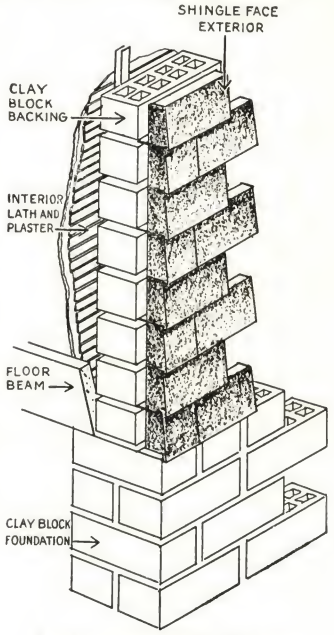
Enameled Brick

Enameled brick have been manufactured by us for many years. They are made up in the finest grade of fire clay, and the enamel and the brick are fired together, forming a complete union between the brick and the enamel. Our enameled brick have been used in some of the largest buildings in the world and we have constantly on hand a stock of the nine standard colors which we manufacture. Standard moulded shapes, bullnose, quoins and coves are made in all colors. Porcelain glazed brick have a dull finish and give an effect similar to white marble. We will manufacture to order special shapes of enameled brick and special colors other than the following: White, Blue, Green, Brown, Chocolate, Gray, Granite and Porcelain. The size of our Standard Enameled Brick is 2¼x3⅞x8 ins. Special Flatters are made in the enameled brick colors in size 8x4x3⅞ ins., also in standard shapes for flatter construction.

Shingle Face Brick

A new development in veneer brick. The distinguishing characteristic is the shape — its slanting face and overlapping bottom edge giving a shingle effect.

Used with a clay block backing it affords a cheaper, though stronger and more attractive means of construction than regular brick. Shingle Face Brick may also be used with a lath backing, and for finishing or veneering over clapboard on existing frame houses, which have a board siding It presents no difficulties in handling corners or around roofs and windows.



Shingle Face Brick Laid with Clay Block

OTHER PRODUCTS

Fire Brick, Safisco Fire-brick Cement, Fire Clay, Ground Refractory.

Write us for full information on any of these products

SEALED JOINT CONSTRUCTION CORPORATION

178 East 85th Street
NEW YORK, N. Y.

SEALED JOINT—A RADICAL DEPARTURE IN BRICK WALL CONSTRUCTION

Without success the ingenuity of architect, engineer and builder has been taxed to erect brick walls that will be watertight. On a finished wall the mortar joints approximate one-fourth of the entire area. If the brick part of the wall absorbs no moisture and the joints are imperfect an enormous amount of water will find its way through and ultimately do serious damage.

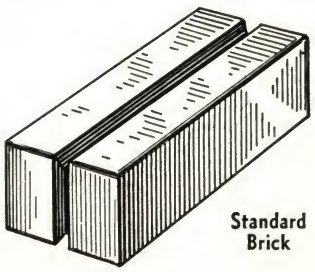
Sealed Joints is a radical departure in the construction of a brick wall from the practice of centuries. Sealed Joint construction makes it possible to erect brick walls that will be waterproof *permanently*. The mortar joint being sealed mechanically, not chemically, is sealed for all time.

Other important features are: lightness; added strength; fire resistance; lightning conductivity; radio shielding properties; air tightness; heat saving and insulating; reduced cost.

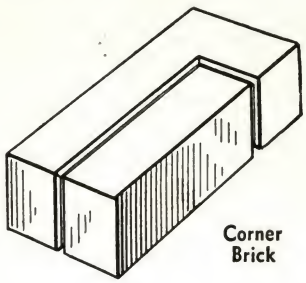
The Principle of Construction

The specially made bricks used in this process have a continuous V-shaped groove ⅜ in. deep in top, bottom and ends. When the bricks are laid these form a continuous horizontal groove and the end grooves align with each other and connect with the horizontal groove. Into these grooves there is inserted, as the brick is laid, an L-shaped piece of non-corrosive alloy made especially for Sealed Joint.

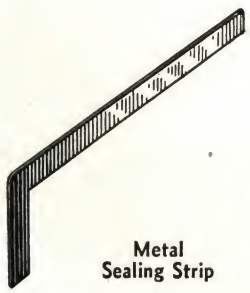
For corners, a special brick is used and the metal bond is bent to fit. This brick may also be used at the end of a course where a half brick is required.



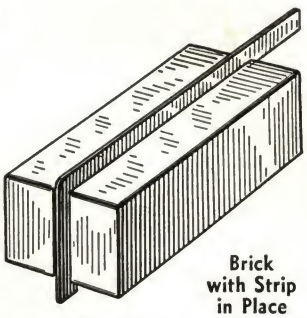
Standard Brick



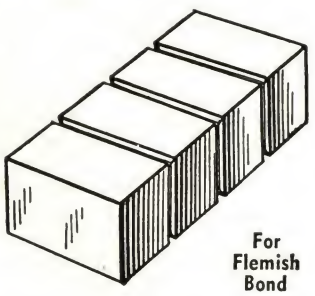
Corner Brick



Metal Sealing Strip



Brick with Strip in Place



For Flemish Bond

Where Flemish bond is desirable a special brick with grooves running around instead of longitudinally is used.

Special Metal Reinforcement

The L-shaped hook, being vertical, forms a permanent lock or key between the ends of two abutting bricks. The metal strip running the length of the brick forms a permanent lock or key with the halves of the two bricks immediately above. The strip always being longer than the brick, overlaps the strip in the abutting brick. The L-shaped hook goes down and overlaps the horizontal strip in the course below. So, when the wall is completed, these metal strip inserts form a mesh reinforcement vertically and horizontally.

Size of Mortar Joint

The width of joint required in the completed wall must be stated in architect's specifications that the L-shaped metal strip may be supplied in proper size. The metal strip is inserted ⅜ in. deep in the V-shaped grooves in both lower and upper brick; therefore the width of strip necessary to produce the required width of mortar joint is determined by adding ¾ in. to the width of the joint specified by the architect. For illustration: if joints of ⅜ in. are specified a strip of 1⅛ in. wide is necessary.

How Sealed Joint Process Is Sold

Patents covering Sealed Joint Process were granted and issued on September 1st, 1931. SEALED JOINT CONSTRUCTION CORPORATION sells the owner or contractor a license certificate authorizing the erection of a building by Sealed Joint Process. Based upon the square feet of wall in which Sealed Joint is to be used, a flat sum of money is paid by the owner or builder for this license certificate, including the necessary metal and such engineering supervision as the SEALED JOINT CONSTRUCTION CORPORATION may deem necessary.

National Distribution

Sealed Joint Process is sponsored by important factors in the American brick industry and the special brick may be produced by any manufacturer who desires to do so.

Specification for Sealed Joint Construction

All face brick shall be laid by Sealed Joint Process. (If Sealed Joint is to be used in only part of building, for example, north wall, then specifications should specifically point out that part of building which is to be so constructed.)

Face brick shall be made with ⅜-in. Sealed Joint Groove, according to the detailed drawings which may be obtained by brick manufacturer from SEALED JOINT CONSTRUCTION CORPORATION. The brick manufacturer shall have groove approved by SEALED JOINT CONSTRUCTION CORPORATION.

Brick used in Sealed Joint Process may be purchased from any brick manufacturer, subject to architect's specifications as to color, texture, size, shape, etc. The difference between the brick used in Sealed Joint Process, and other brick, is the continuous V-shaped groove ⅜ in. deep, running the length of brick, top, bottom, and in each end centered longitudinally.

Permanent Display

A permanent display of Sealed Joint construction has been erected at 178 East 85th Street, New York, N. Y., which is open for inspection of architects and builders.

THE STARK BRICK COMPANY

CANTON, OHIO

FACTORY: EAST CANTON, OHIO
REPRESENTATIVES IN ALL PRINCIPAL CITIES

STARK SALT GLAZED BRICTILE AND BRICK

Stark Salt Glazed Products have been made by this Company for over twenty years. Constant study, and improvements in machinery and methods have raised them to a recognized place among the finest building materials known.

Our service is prompt and efficient. A yard stock of between five and six million brick reduces delivery delay to a minimum.

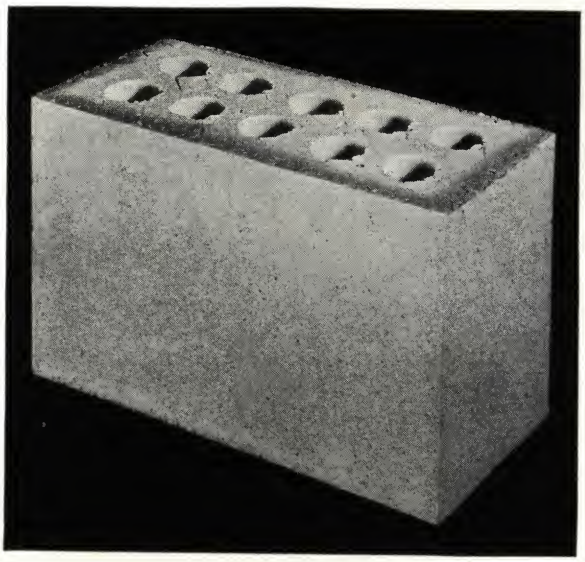
Representatives in all the principal cities are in constant touch with the home office and will always welcome the opportunity to figure on your requirements and otherwise serve you.

The name and address of your nearest Stark Salt Glazed Brick representatives will be furnished promptly on request.

BRICTILE

The trend in construction, making it necessary in certain buildings to economize without sacrificing beauty or utility, created the demand for a salt glazed unit to meet this requirement.

Exhaustive experiments proved conclusively that neither the length nor the width of a standard brick can be increased without increasing difficulties in laying to an almost prohibitive extent. The age-old rule in brick-making, that the unit must be just twice as long as it is wide, plus the cross joint, cannot be changed. But the thickness or height can be doubled, and the unit can still be handled in laying the same as standard brick, *provided a successful means of bonding to give structural strength is used.*



Stark Brictile

Bonding strength in Stark Salt Glazed Brictile is obtained by ten vertical holes in the unit which interlocks the mortar and makes an exceptionally strong wall in bearing and under side-wise thrusts, while the holes make the units lighter in weight. The Brictile and the mortar interlock so firmly that the possibility of the wall cracking or buckling, if the foundations are solid, is reduced to an absolute minimum.

From the very beginning of the wall, the vertical holes in Brictile and consequent interlocking of mortar enables the mason to get a uniform bed joint, and when Brictile are spotted or bedded they stay. They will not float.

Mortar Joint

Brictile are made with square edges to enable the mason to get a quarter-inch mortar joint. He does this by spreading the mortar, it being unnecessary to swipe or butter Brictile.

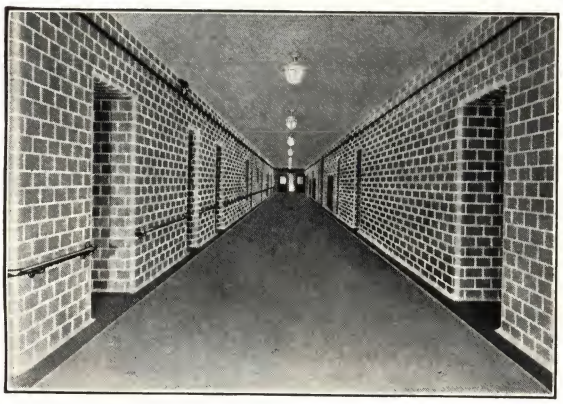
Natural Grip

Brictile are eight inches long and three and seven-eighths inches wide, the same as standard brick. As the brick-mason is accustomed to this length, long known for its balance regardless of where it is grasped, he uses his natural grip and finds these units as convenient as standard brick. Brictile must not be confused with hollow-tile, for Brictile is essentially a brick, but twice the height and cored to reduce the weight.

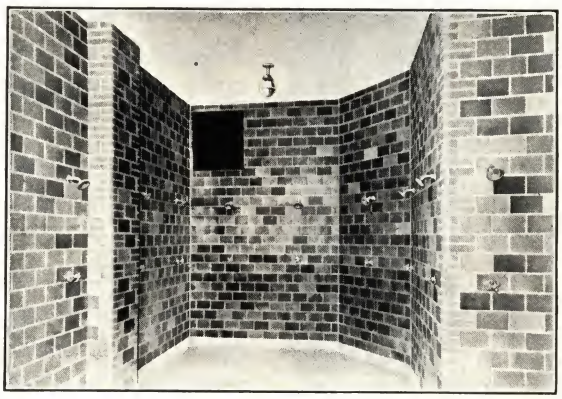
The Detroit Testing Laboratory of Detroit, Mich., made a Compression Test of Brictile, which is given below. Their number for this test is 0311-C-3.

Fire Insurance Rates

Insurance rates for structures built of different classes



Left:
Main Corridor, Dr. Charles Oakman School, Detroit, Mich.
SMITH, HINCHMAN & GRYLLS, Architects



Right:
Shower Room, Hazel Park High School, Hazel Park, Mich.
BURROWES & EURICH, Architects

No.	Size	Gross Area sq. in.	Crushing Strength	
			Load In pounds	Pounds per sq. in.
1	7.90 x 3.80	30.00	222,900	7,430
2	7.85 x 3.75	29.40	220,000	7,480
3	7.92 x 3.82	30.25	219,200	7.230

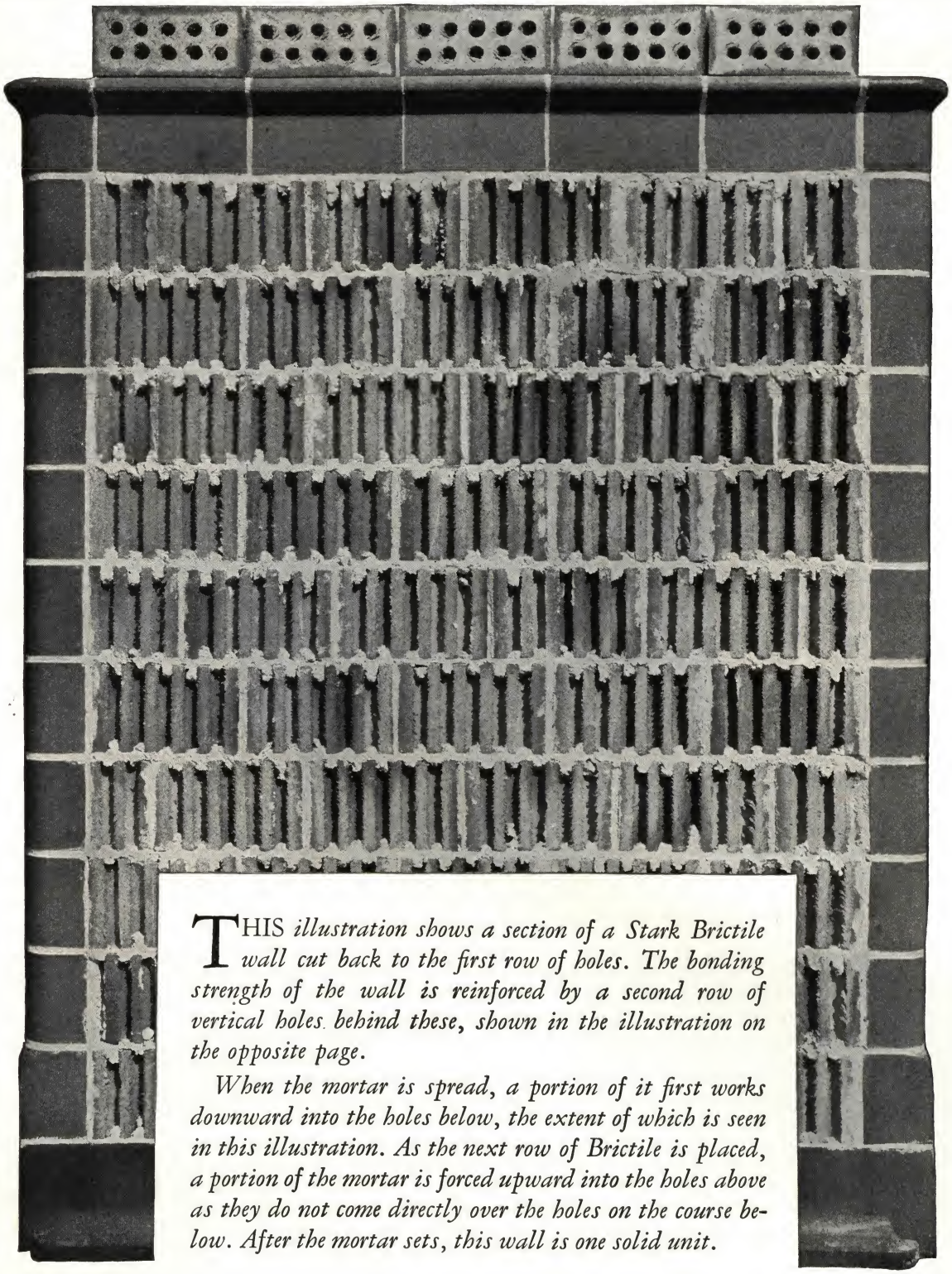
of building units are made by local rating bureaus and boards who make specifications and establish the rates for different territories, functioning the same as the Ohio Inspection Bureau does for the State of Ohio.

In drawing the line between brick and tile, in the classification of a building unit, the general procedure is to allow twenty-five per cent of open spaces in a unit classed as brick. In other words, a brick is usually defined as a structural unit of specified material and shape, the net sectional area of which shall be not less than seventy-five per cent of the gross sectional area.

As the open space in Brictile is less than twenty-five per cent of the gross sectional area, Brictile under this ruling classify as brick, not as tile.

No Special Corners or Closed Ends

Being the same length as brick, glazed on the face,



THIS illustration shows a section of a Stark Brictile wall cut back to the first row of holes. The bonding strength of the wall is reinforced by a second row of vertical holes behind these, shown in the illustration on the opposite page.

When the mortar is spread, a portion of it first works downward into the holes below, the extent of which is seen in this illustration. As the next row of Brictile is placed, a portion of the mortar is forced upward into the holes above as they do not come directly over the holes on the course below. After the mortar sets, this wall is one solid unit.

back and both ends, it is unnecessary to use special corners or closed ends. With Brictile, any standard bond can be used the same as standard brick.

No Factory Made Closures

Brictile can be cut even better than standard face brick, making it unnecessary to order fractional lengths or closures. These are cut on the job and the piles of different size pieces on the scaffold are eliminated.

Soaps Seldom Needed

Soaps are carried in stock, but Brictile can be split with a brick hammer from a one-inch to a three-inch slab. This is frequently very helpful as it is difficult to foresee where a slab or a soap will be needed on a job.

Advantages of Stark Salt Glaze

Glazing brick with salt dates back several hundred years and in Stark County, Ohio, the section famed for the purity of its fire clay, the Stark Brick Company has in its organization men whose lifetime training has been in this line. They work with the most complete and improved brick making machinery, producing a quality product not excelled by any other plant in the world.

Before being burned, Brictile are similar in appearance to white and buff face brick. At the end of the burning process, salt and other chemicals are introduced into the kiln and vaporized. As this vapor is deposited on the exposed surfaces of the Brictile a chemical reaction takes place, forming an indestructible film of glass which is fused with the body of the unit. This smooth surface, similar to that on chinaware, is impervious to moisture, oils or greases. The uniform heavy glaze goes deeper than the surface, penetrating and becoming an integral part of the Brictile and, having the same expansion and contraction, it will not craze or check.

Cleaning

Brictile can be easily washed at any time with soap or washing powder and water, which quickly restores their original freshness and beauty. If cleaned with acid, which is not recommended, the wall must be thoroughly rinsed with water as acid will attack the cement or lime mortar in the joints. All Stark Brictile walls should be wiped off as the laying progresses to prevent spatterings of mortar from hardening on the surface of the units. If this mortar becomes hardened it is much more difficult to remove. Care should be taken to have scaffolds and other obstructions which are near the wall removed when pouring concrete floors above the finished walls. These precautions will prove economical when cleaning for occupancy.

Sanitation

With no pores, holes or crevices to secrete bacteria, dirt or dust, Brictile are thoroughly sanitary. This feature makes the product especially desirable for interior finish in buildings where food products are stored or handled such as restaurants, cafeterias, kitchens, creameries, dairies, bakeries, packing houses, canneries, cold storage rooms, hotels, clubs and hospitals.

Oil, Grease and Acid Resistance

The resistance of Brictile to the action of oils, greases and acids is not alone due to the glazed surface but to the thorough vitrification of the exposed faces on the Brictile. For this reason they are especially adapted for use as an interior wall facing in schools, gymnasiums, shower rooms, lavatories, swimming pools, garages, service stations, subways, tunnels, power plants, boiler rooms, steam and electric plants, fire stations, steel, coke and by-product plants, and all factories where acids are used in manufacturing processes.

Special Shapes

A large and complete line of standard Brictile shapes, illustrated on the following pages, are carried in stock at all times from which immediate shipment can be made.

Any special shapes can be made to architect's specifications. The process of manufacture requires from two to four weeks and time can be saved if detail sketches are furnished with orders.

Estimating Quantities

As Brictile have glazed ends, and are the same length as standard brick, and as it is unnecessary to order fractional lengths or closures, any estimator who is familiar with computing the quantity of standard brick for a job from the plans, can figure the quantity of Brictile required. It is therefore unnecessary for us to estimate the quantity, so we do not need the plans and specifications unless we are to check an estimator's quantities.

Storage on the Job

Brictile like face brick of any kind, when stored on the job, should be kept in a clean, dry place and thoroughly protected from the elements at all seasons of the year. This precaution facilitates laying, saves much time and insures a cleaner job.

Economy In Erection

The important saving in labor costs is due to the greater speed with which Brictile walls can be erected. Every time a mason lays one Brictile he lays the equivalent of two standard brick with a very large saving in mortar. Fire resistive and permanent, an effective barrier to the passage of heat and cold, this material represents the most economical form of permanent interior construction with all the beauty, inherent in the eight-inch unit, retained.

DEFINITIONS

"Stark Salt Glazed Brictile"—A smooth fire clay unit, glazed on the face, back and both ends. It is essentially a double brick, size 4⅞ x 8 x 3⅞ ins., the face size being 4⅞ x 8 ins. The glaze in a thin coating of glass fused with the body of the unit, making these surfaces impervious. Brictile have ten round holes, materially reducing the weight and serving as anchorage for the mortar between courses.

"Shade Ranges"—Brictile have a limited color variation in each range of shades:

SHADE RANGE 50—Cream color
SHADE RANGE 60—Light buff color
SHADE RANGE 75—Medium buff color

"Mingled Shades"—A harmonious mixture of various colors, designated as follows:

"Gratone Brictile"—A blend of gray and cream colored Brictile.

"Buftone Brictile"—A blend of light and medium buff colored Brictile.

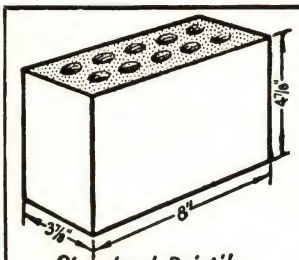
"Court Brictile"—Brictile having slight mechanical defects and glaze imperfections. Furnished in light or dark mingled shades.

"Commercial Brictile"—Brictile having larger defects, including handling chips, factory and kiln marks. Furnished in light or dark mingled shades. This quality is the least expensive and is also free from crooked units.

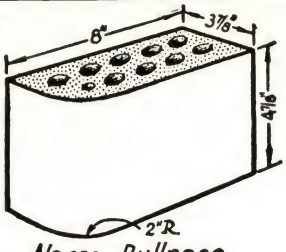
"Soap"—Size 1¾ x 4⅞ x 8 ins. A Brictile approximately one-half standard thickness.

"Furring Brictile"—The Brictile soap described above is used for furring.

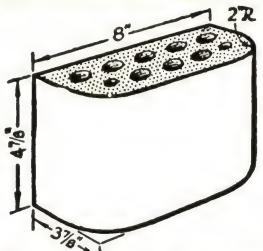
"Scored Brictile"—Size 4⅞ x 8 x 3⅞ ins., Brictile having dovetail scorings on back for applying plaster. However, in many cases plaster can be applied on the back of Standard Brictile having a smooth glazed surface.



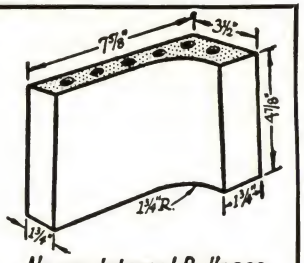
Standard Brictile



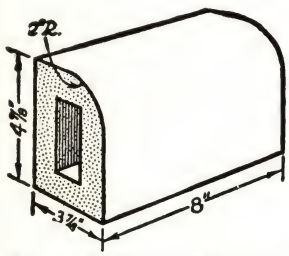
No. 101 – Bullnose



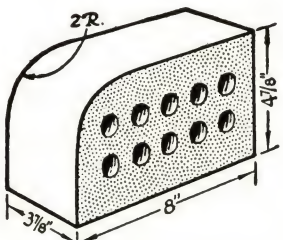
No. 102 – Double Bullnose



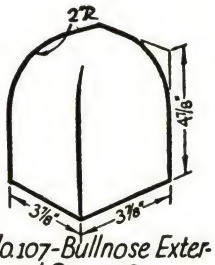
No. 103 – Internal Bullnose



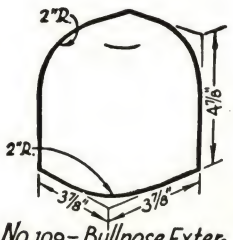
No. 104 – Bullnose Stretcher



No. 105 – Bullnose Header

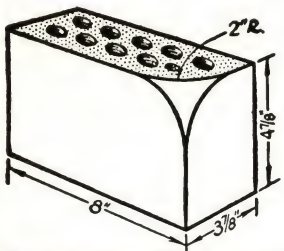


No. 107 – Bullnose External Corner – Square

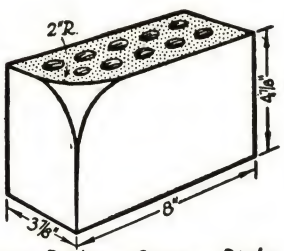


No. 109 – Bullnose External Corner – Round

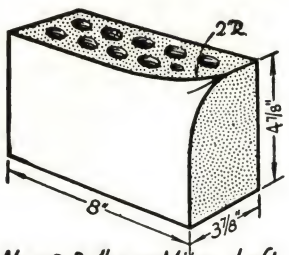
No. 111 – Bullnose Internal Corner



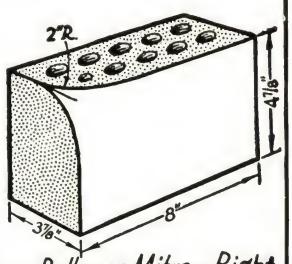
No. 114 – Bullnose Starter – Left



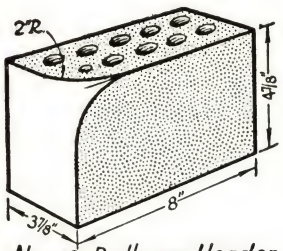
No. 115 – Bullnose Starter – Right



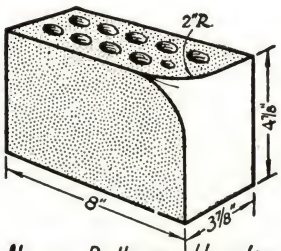
No. 116 – Bullnose Mitre – Left



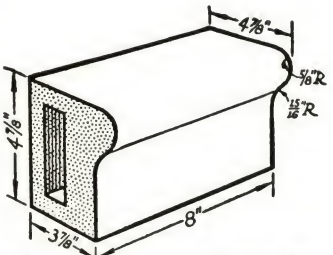
No. 117 – Bullnose Mitre – Right



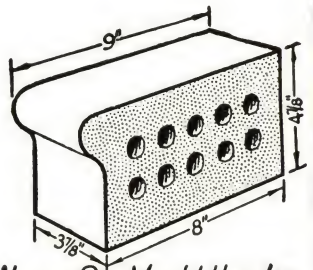
No. 118 – Bullnose Header Mitre – Left



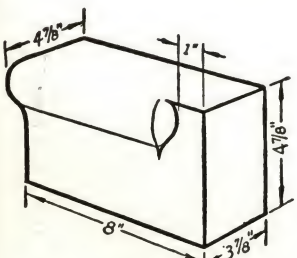
No. 119 – Bullnose Header Mitre – Right



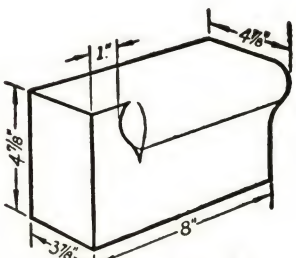
No. 120 – Cap Mould Stretcher



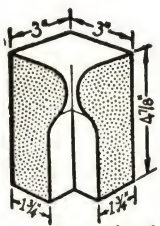
No. 121 – Cap Mould Header



No. 122 – Cap Mould Starter – Left



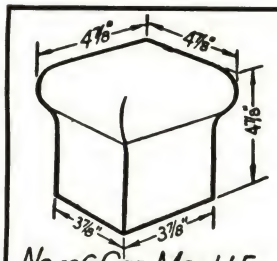
No. 123 – Cap Mould Starter – Right



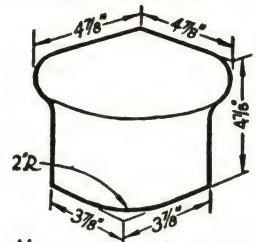
No. 124 – Cap Mould Internal Corner – Square

No. 125 – Cap Mould Internal Corner – Round

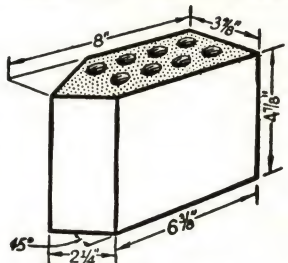
STANDARD SHAPES AND SIZES OF STARK SALT-GLAZED BRICTILE



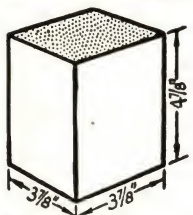
No. 126-Cap Mould External Corner-Square



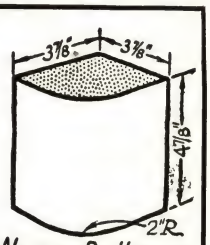
No. 127-Cap Mould External Corner-Round



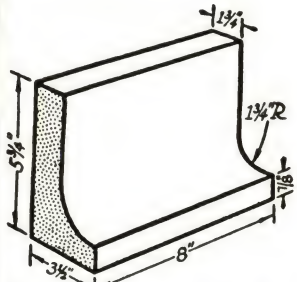
No. 128-Octagon



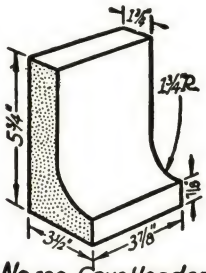
No. 129-Square Corner Block



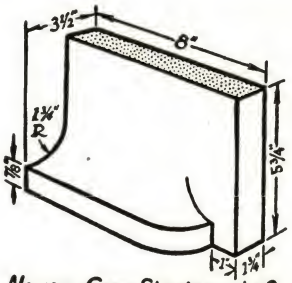
No. 130-Bullnose Corner Block



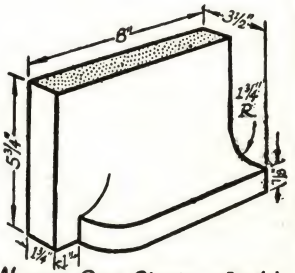
No. 131-Cove Stretcher



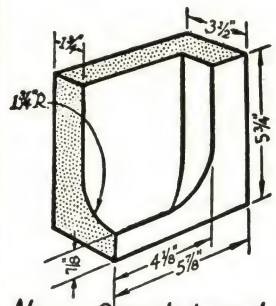
No. 132-Cove Header



No. 133-Cove Starter-Left



No. 134-Cove Starter-Right



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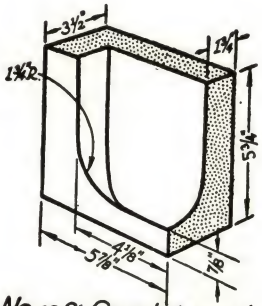
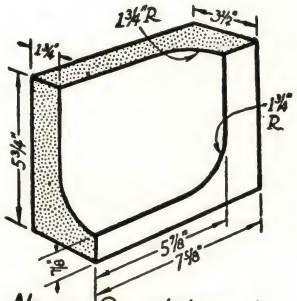
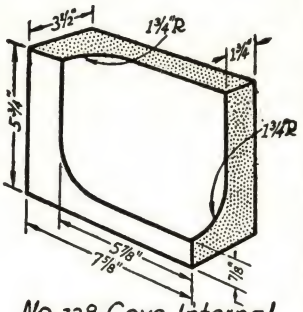


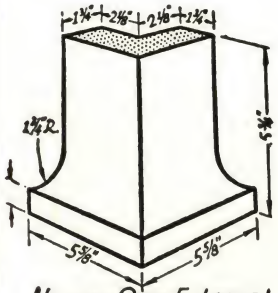
No. 136-Cove Internal Square Corner-Right



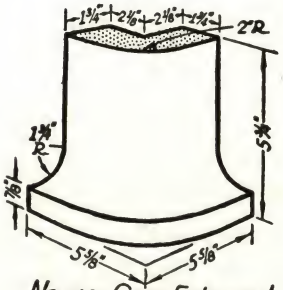
No. 137-Cove Internal Round Corner-Left



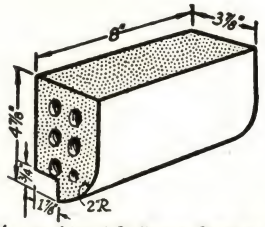
No. 138-Cove Internal Round Corner-Right



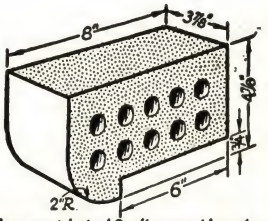
No. 139-Cove External Corner-Square



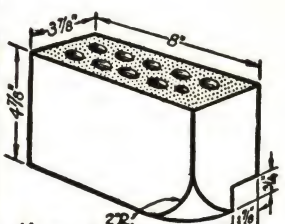
No. 140-Cove External Corner-Round



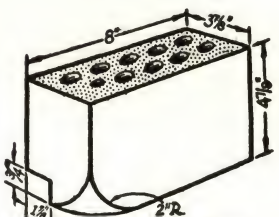
No. 141-Lintel Bullnose Stretcher



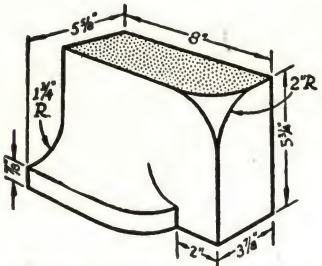
No. 142-Lintel Bullnose Header



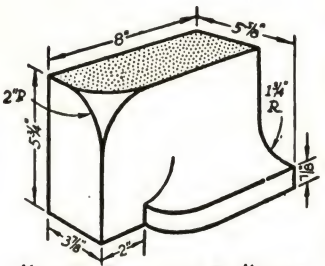
No. 143-Lintel Bullnose Starter-Left



No. 144-Lintel Bullnose Starter-Right

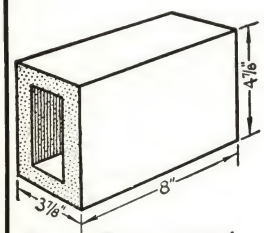


No. 145-Cove and Bullnose Starter-Left

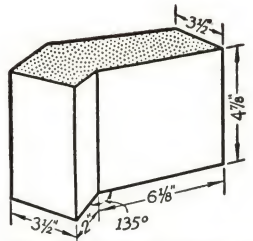


No. 146-Cove and Bullnose Starter-Right

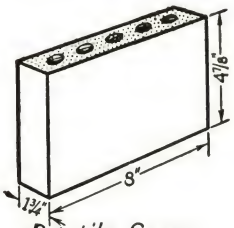
STANDARD SHAPES AND SIZES OF STARK SALT-GLAZED BRICTILE



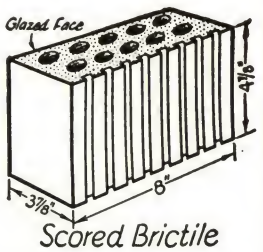
No. 147–Square Lintel or Sill Block



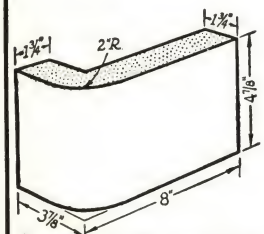
No. 148–Internal Octagon



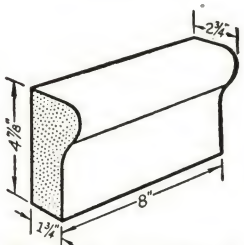
Brictile Soap



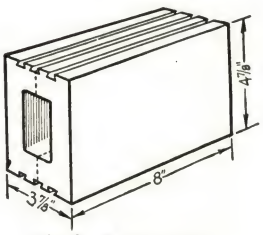
Scored Brictile



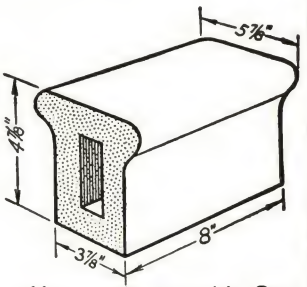
No. 101-S–Bullnose Soap



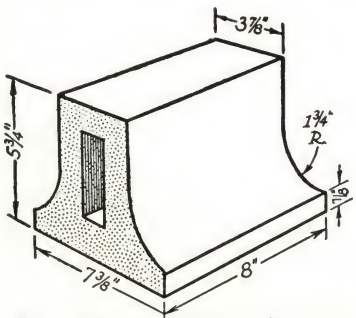
No. 120-S–Cap Mould Stretcher Soap



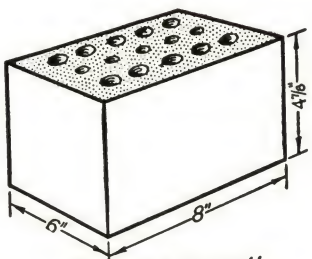
Kerfed Brictile



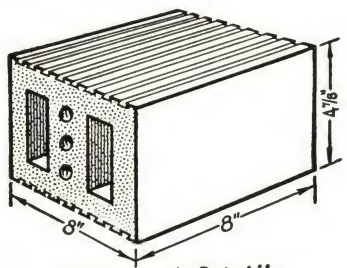
No. 120-D–Double Cap Mould Stretcher



No. 131-D–Double Cove Stretcher



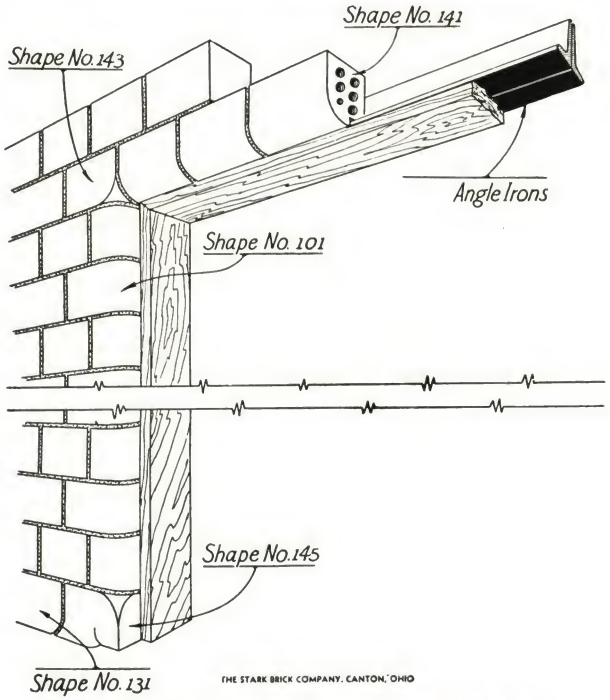
Six-Inch Brictile



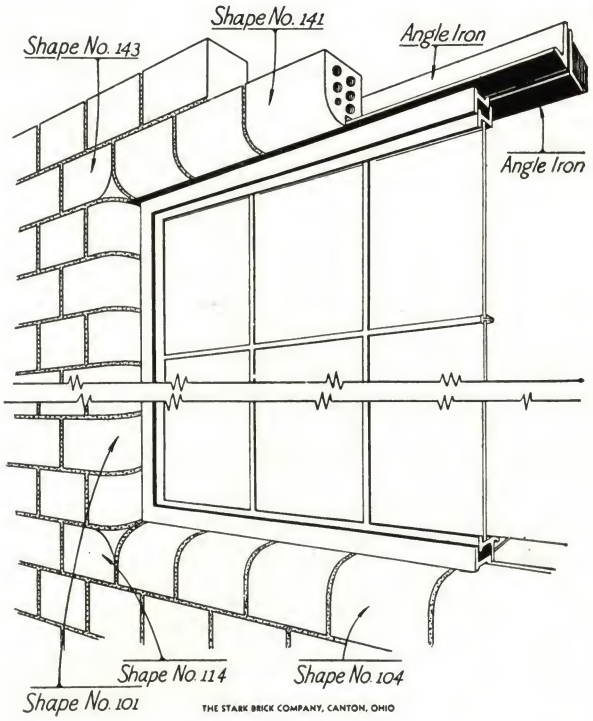
Eight-Inch Brictile

Brictile Size Advantages

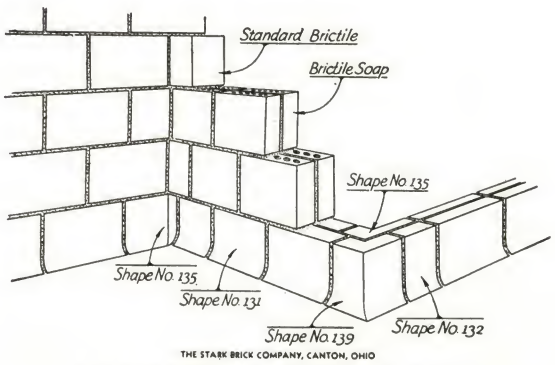
1. One unit for all—Stretcher, Header and Corner Block.
2. Manufactured from fireclay, insuring uniform size.
3. Eight-inch length enables mason to lay with one hand.
4. Most economical glazed material made.
5. All square edges—can be laid with ¼" spread joint.
6. Vertical holes through body anchors mortar. Perfect bond.
7. Units when laid will not float regardless of conditions.
8. Fractional length or width pieces easily cut on job by mason.
9. Units load bearing—will pass code requirements.
10. Can be furnished with one side scored for plastering or faces glazed—4-inch wall.



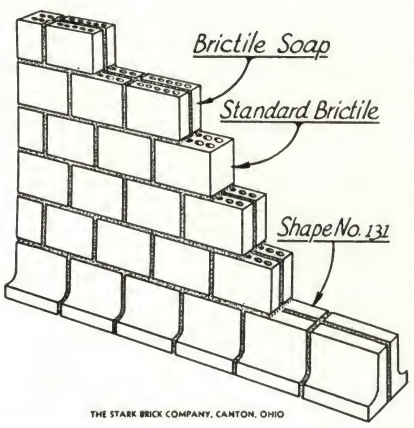
Detail of Cased Opening, Showing Cove Base with Bullnose Jamb and Lintel



Detail of Window, Showing Use of Various Brictile Bullnose Shapes

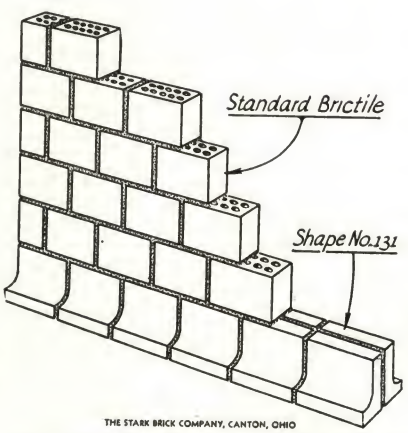


Detail of Four-inch Wall, Faced Both Sides, Showing Use of Cove Shapes



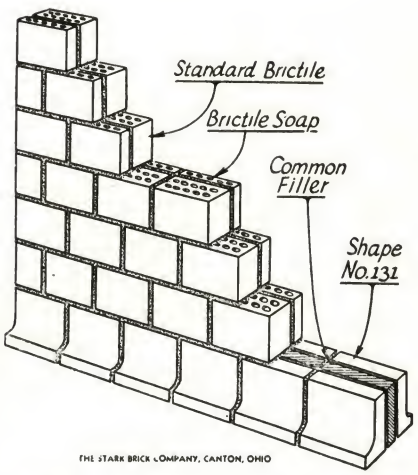
Four-inch Wall, Using Four-inch Wall of Brictile to provide a Face on Each Side of Wall

A very practical and strong four-inch wall



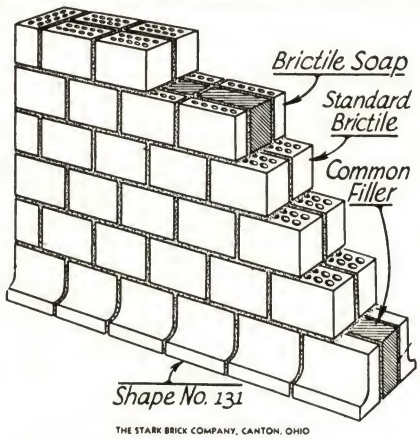
Four-inch Wall, Using Brictile Selected for Two Faces

Brictile, scored on the back, used when one side plaster finish is desired

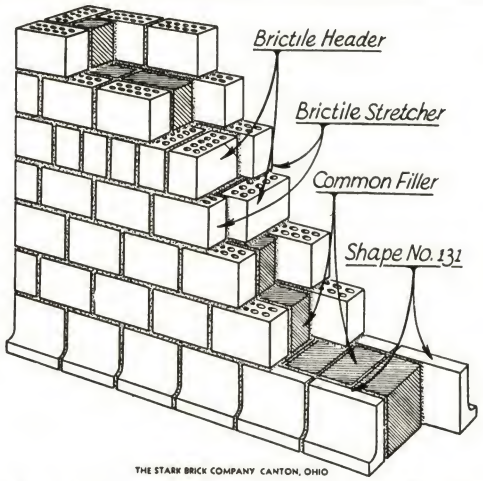


Bond of Six-inch Wall of Brictile Soaps and Standard Brictile

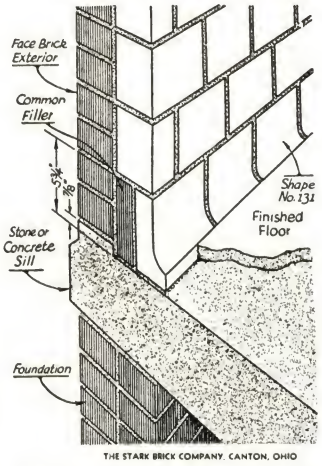
DETAILS OF WALL SECTIONS



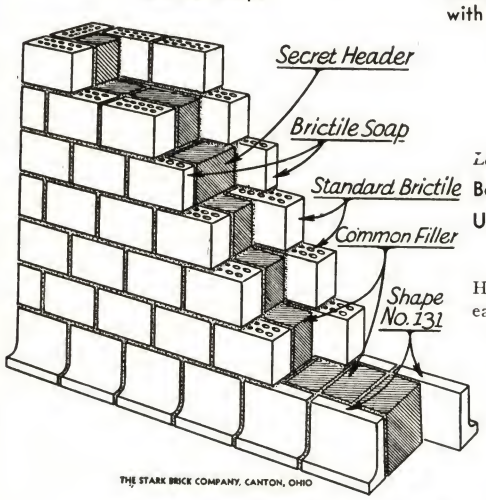
Bond of Twelve-inch Wall of Standard Brictile, Using Secret Header and Brictile Soaps



Bond of Eight-inch Wall of Standard Brictile "tide" with Secret Common Filler and Brictile Stretcher Face, Showing on Both Sides of Wall



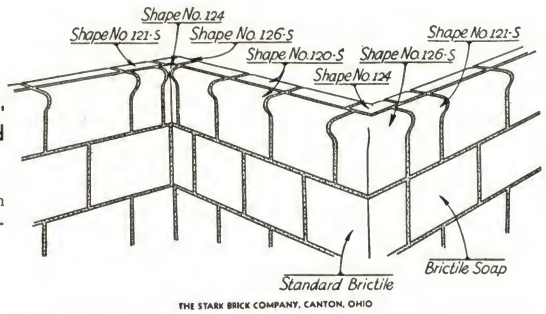
Section of Eight-inch Exterior Wall Faced with Brictile, Showing Detail of Concrete or Stone Sill to Accommodate 5¾" Cove Base



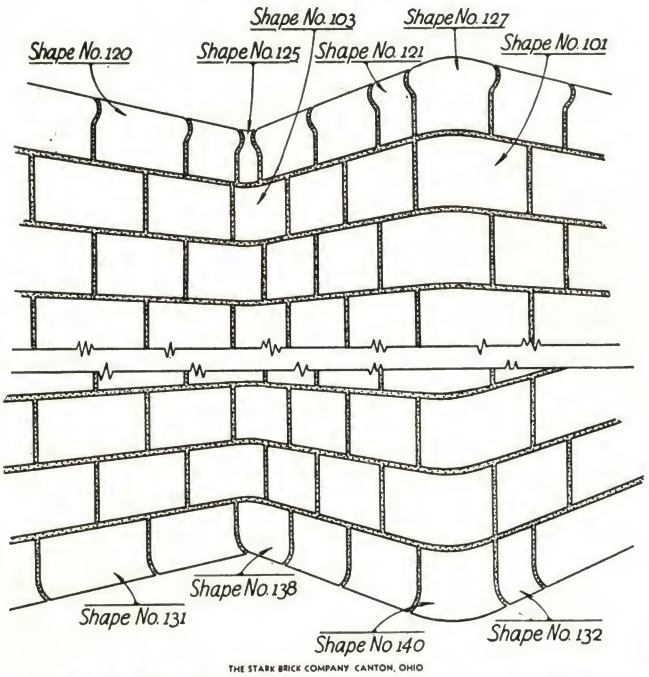
Left:

Bond of Twelve-inch Wall, Using Standard Brictile and Common Filler

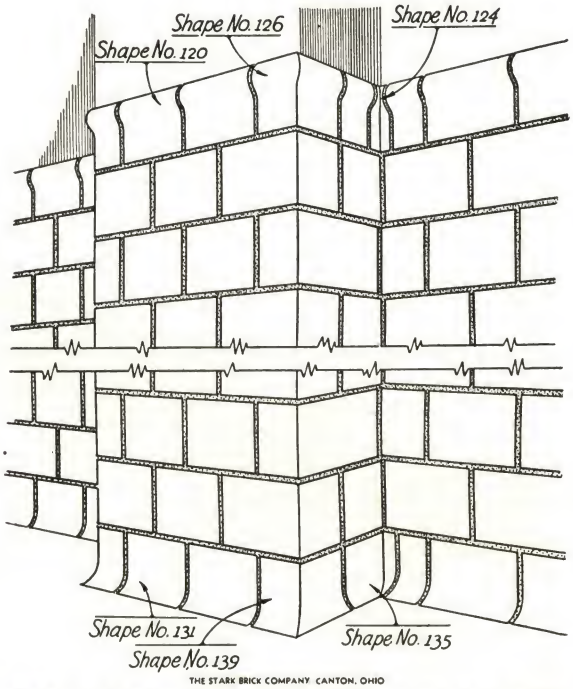
Header face, showing on each side of wall on alternate bonding courses



Detail of Four-inch Wall, Faced Both Sides, Showing Use of Cap Mould Soap Shapes



Detail of Offset in Wall, Showing Use of Cove and Cap Mould Stretchers with Round External and Internal Corners



Detail of Pilaster, Showing Use of Cove and Cap Mould Stretchers with Square External and Internal Corners

STARK SALT GLAZED BRICK

Stark Salt Glazed Brick have been on the market for a score of years and are at the present time being used extensively by architects throughout the United States and Canada. Their richness of color and mechanical perfection are two of the factors which account for their wide popularity.

Uses

Stark Salt Glazed Brick are admirably suited for interior walls of schools, gymnasiums, shower rooms, swimming pools, cafeterias, kitchens, lavatories, corridors, stairways, manual training and domestic science rooms, auditoriums, lobbies, courts, power and boiler rooms and for wainscoting in class rooms.

They are especially valuable for use in hospitals, creameries, dairies, bakeries, packing houses, canneries and other food product plants, steam and electric plants, cold storage rooms, office and apartment buildings, hotels, country clubs, and many other structures.

A very satisfactory and attractive wall can be secured by using a quarter inch (¼-in.) joint of natural colored mortar. Care should be taken to select a clean, fine sand as the smoothness of the joint depends largely upon this ingredient.

In recent years there has been a rapidly growing demand for Stark Salt Glazed Brick in private houses for facing basements, solariums and porches. They are especially suited for use in fire places because soot and smoke may be washed from the glazed surfaces.

Large quantities are also being used in the interior of steel, coke, by-products and other manufacturing plants where color, sanitation, non-absorptive and acid-resisting qualities are desired.

Nature of the Brick

The brick are manufactured by the stiff mud process. Before glazing they are similar in many respects to the white and buff face brick and the process of manufacturing is very similar until the burning period. At this point salt is introduced into the fires which vaporizes rapidly. This salt vapor is deposited on the exposed faces of the brick, setting up a chemical reaction which forms a film of glass fused with the body of the brick.

During the burning process the rich colors are developed and the utmost care is exercised during this period. The colors developed by the various treatments under this intense heat are permanent and will never fade or change.

Advantages

The glaze on Stark Salt Glazed Brick, which is in truth a thin coating of glass, is impervious to moisture, making the brick especially valuable where this condition is encountered. This advantage, and the ease with which they may be cleaned make them especially valuable where sanitation is a requisite.

Because of their resistance to acid, Stark Salt Glazed Brick have been widely used in laboratories and industrial plants where chemicals are destructive to other materials.

While the original cost of using Stark Brick may be slightly higher than for some types of construction, the negligible maintenance cost over a period of a few years show their use to be the strictest economy.

Color

The medium buff color of the brick approximates the most popular color used for interior decorating, while the slight variation in shade relieves the monotony of a solid color and increases the attractiveness of the wall.

DEFINITIONS

"Stark Salt Glazed Brick"—A smooth standard size (3⅞ x 2¼ x 8 ins.) fire clay brick, glazed on the face, back and both ends. The glaze is a thin coating of glass fused with the body of the brick, which renders these surfaces impervious.

"Shaded Brick"—Brick as near as practicable a single color. Designated by the following numbers (from light to dark):

Light	Light	Med.	Dark
50	60	80	95
55	75	90	

"Mingled Shades"—A harmonious mixture of various color brick. Designated by the following:

"Gratones"—A blend of gray and cream colored brick.

"Lite Buff"—A blend of cream and lite buff colored brick.

"Buftones"—A blend of light buff colored brick.

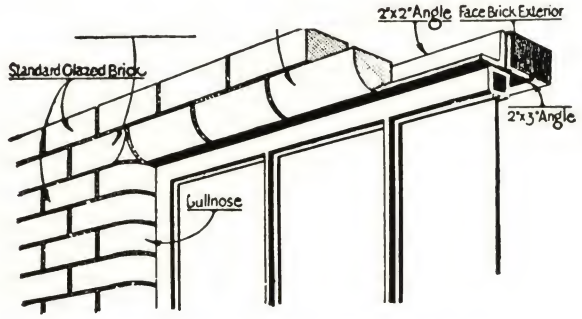
"Darctones"—A blend of dark buff colored brick.

"Courts"—Brick having only small defects. Mingled in shade, gray, light or dark.

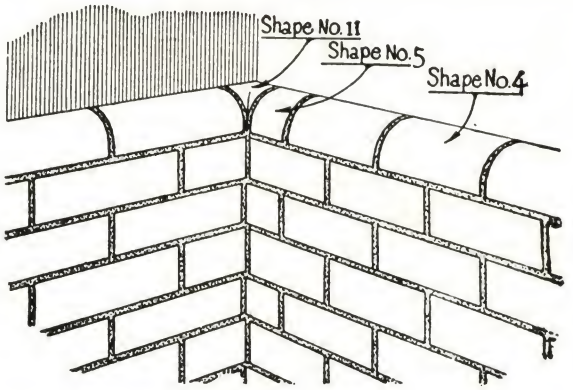
"Commercials"—Brick having larger defects including factory and kiln marks. This quality is the least expensive, and is also free from crooked or warped brick. Mingled in shade, gray, light or dark.

Reading Passenger Station

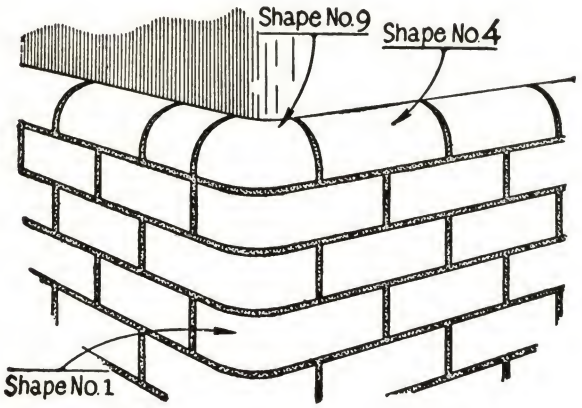
North Side Junior High School



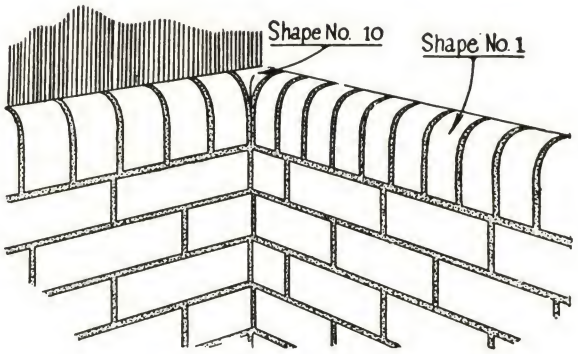
Detail of Window Construction Showing Use of Bullnose Lintel Brick



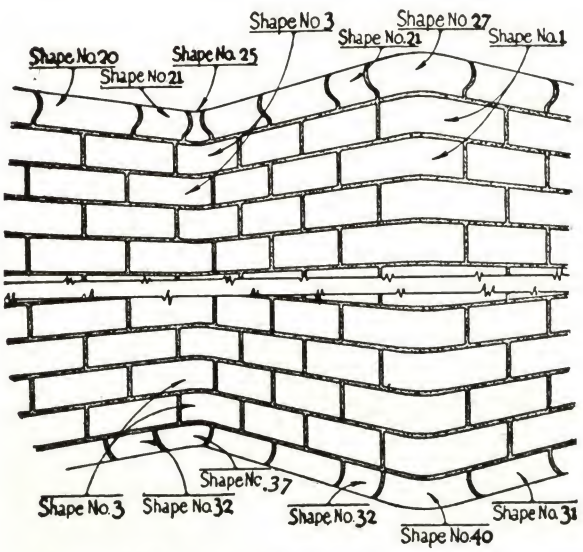
Detail of Wall Showing Bullnose Stretcher as Capping, Square Internal Corner



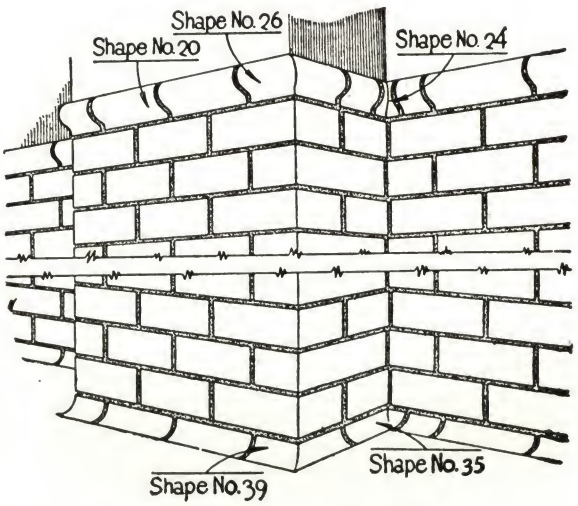
Detail of Wall Showing Bullnose Stretcher as Capping, Round External Corner



Detail of Wall Showing Bullnose Rowlock Course, Square Internal Corner

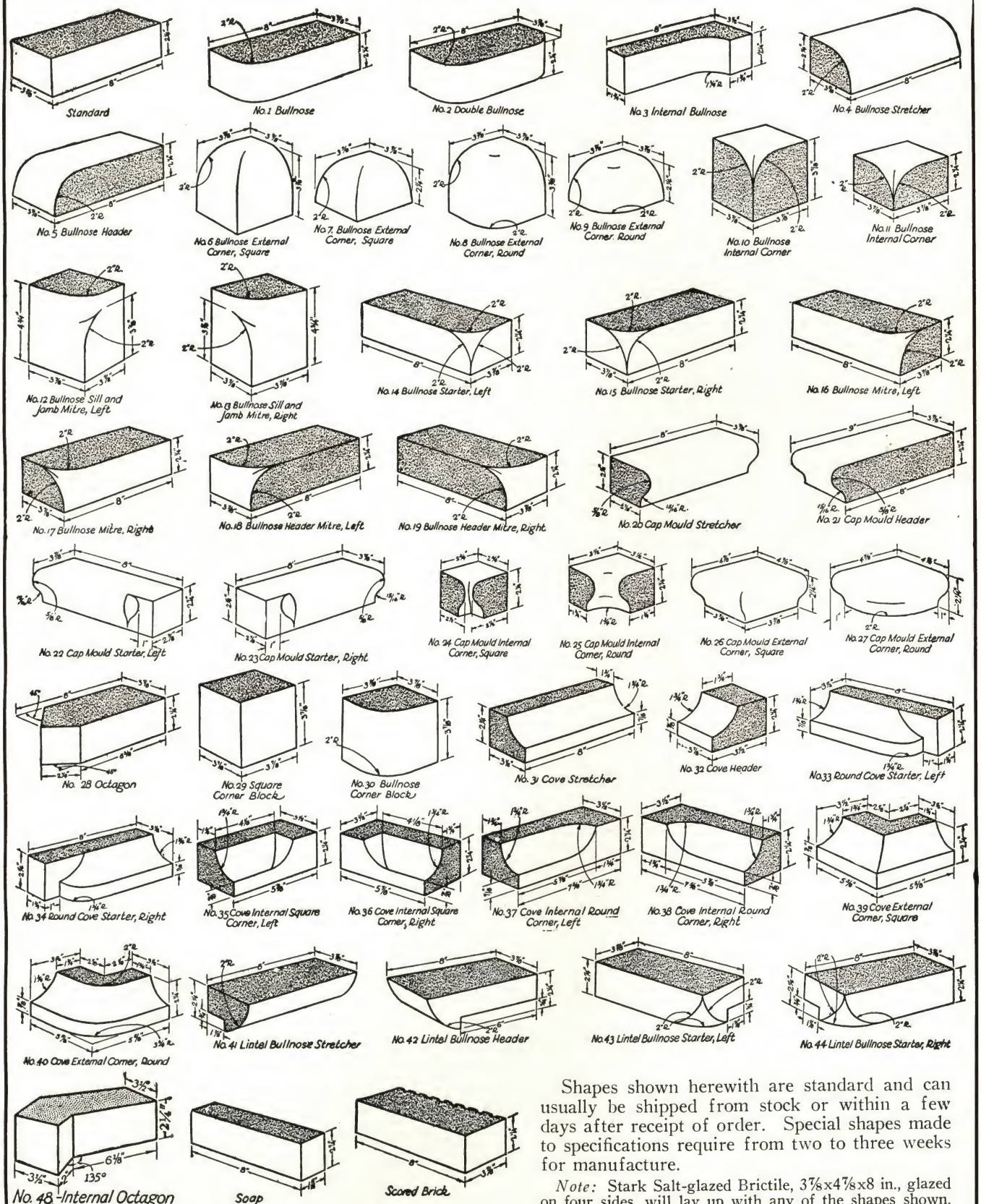


Detail of Offset in Wall Using Cove Base and Cap Mould, Showing Round External and Internal Corners



Detail of Pilaster Using Cove Base and Cap Mould, Showing Square External and Internal Corners

DETAILS OF WALL SECTIONS



Shapes shown herewith are standard and can usually be shipped from stock or within a few days after receipt of order. Special shapes made to specifications require from two to three weeks for manufacture.

Note: Stark Salt-glazed Brictile, 3⅞x4⅞x8 in., glazed on four sides, will lay up with any of the shapes shown.

STANDARD SHAPES AND SIZES OF STARK SALT-GLAZED BRICK

THE SUGARCREEK CLAY PRODUCTS CO.

Manufacturers of the Original Sugarcreek Face Brick

SUGARCREEK, OHIO

Products

The original SUGARCREEK FACE BRICK in a wide range of colors from dark red to light buff. Manufactured in the heart of nature's best shale and fire clay deposits.

Colors

Sugarcreek Texture Face Brick embrace the following colors: Light, medium and dark red; light and dark red hearts; light and dark brown; blue, black or gunmetal; light and dark tangerines; light, medium and golden buff; orange and light green polychromes. Also smooth reds and smooth ivory.

Special Advantages

All brick are carefully graded and each color piled separately as they come from the kilns. Mixed cars of shale and fire clay material can be loaded and shipped without extra charge.

The various ranges and color mingles are loaded according to percentages and thereby reach the building site in the proper proportion.

Millions of these brick have been used in many different sections of the country on outstanding buildings embracing schools, churches, residences, public and industrial work of all kinds.

Textures

The original Sugarcreek Texture resembles the imprint of delicate fern leaves.

Color panels on two succeeding pages indicate the detail of this texture.

Stocks and Capacity

Stocks are maintained at approximately five million brick insuring prompt shipment of straight shades or mingles.

Plant Location and Shipping Facilities

Located on the Wheeling & Lake Erie Ry. connecting with all trunk lines of the New York Central, Pennsylvania, Baltimore & Ohio, Erie and Nickel Plate railroads.

Special Shapes

Special shapes to match any shade or range required are available on order.

Our unique clay mixtures facilitate the preparation of original blends and ranges.

Samples will be submitted on request and special panels made to specifications.

Agents in all of the principal cities of the United States, east of the Mississippi River.

Representative Buildings Constructed of Sugarcreek Brick

LOCATION	BUILDING	ARCHITECT
Mishawaka, Ind.	High School	Perkins, Fellows & Hamilton
Evanston, Ill.	High School	Perkins, Fellows & Hamilton
Avalon, Pa.	High School	John S. Phillips
Akron, Ohio	United Brethren Church	Melvin Peck
Carrick, Pa.	St. Basils R. C. Church	Simon J. Lang
Akron, Ohio	Wooster Ave. M. E. Church	Martin, Orr & Martin
Columbus, Ohio	Capitol University	Perkins, Fellows & Hamilton
Akron, Ohio	E. Market St. Reformed Church	Henry & Murphy
Pittsburgh, Pa.	St. Joseph's R. C. School	Simon J. Lang

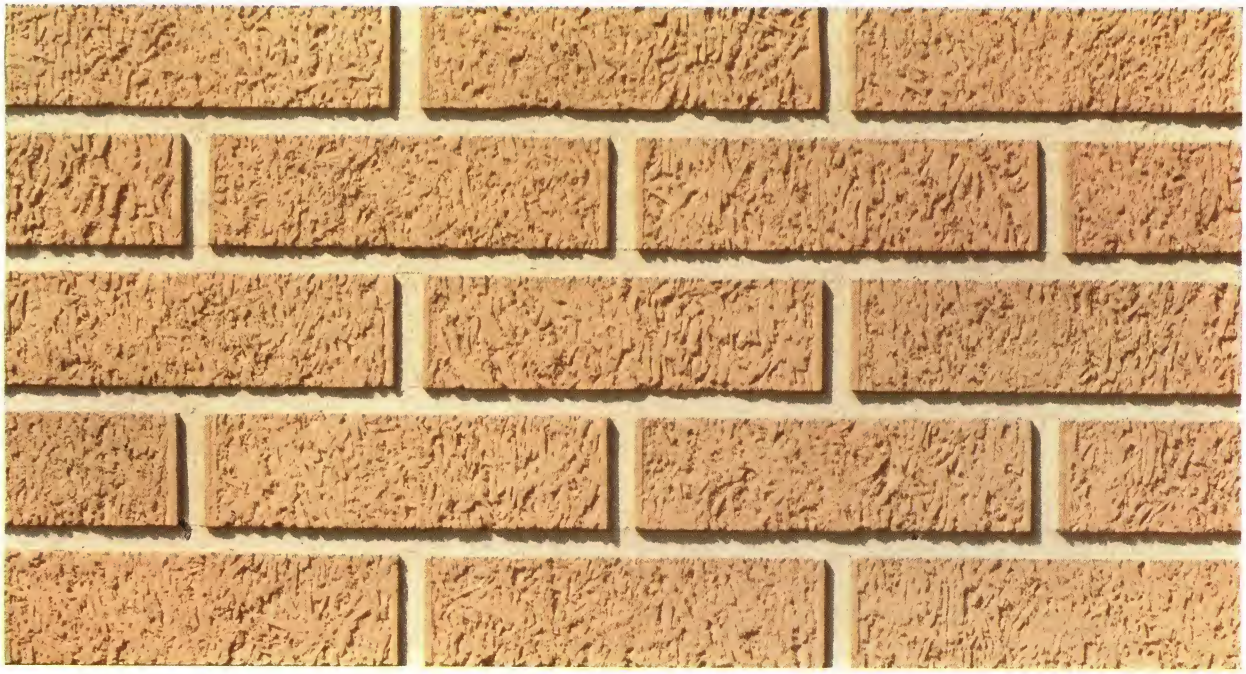
The Albert G. Lane Technical High School, Chicago, Ill.

PAUL GERHARDT, Architect

One of the largest single educational buildings in the world, requiring more than a million and a quarter Sugarcreek Brick

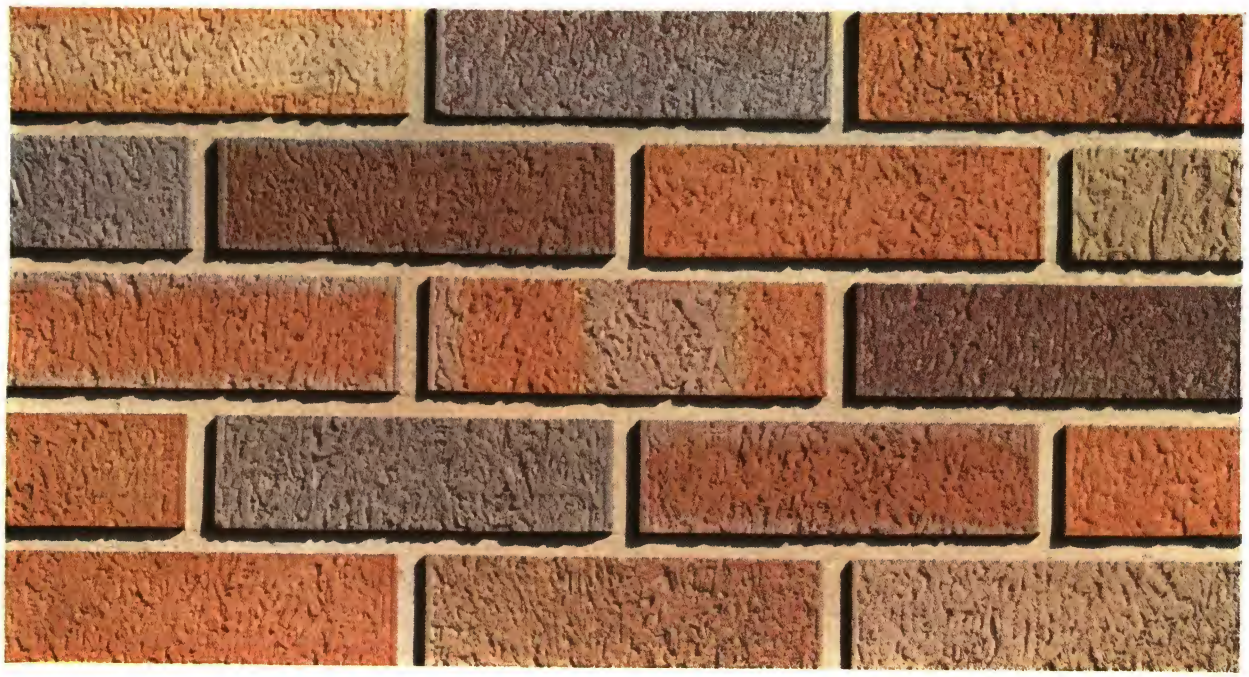
Selected Ranges of Sugarcreek Face Brick

While the color panels shown here faithfully reproduce the texture and a few of the shades and blends of Sugarcreek Brick, the color range is so wide that selection of shades or ranges is limited only by the requirements of the work in hand. Complete color information promptly on request.



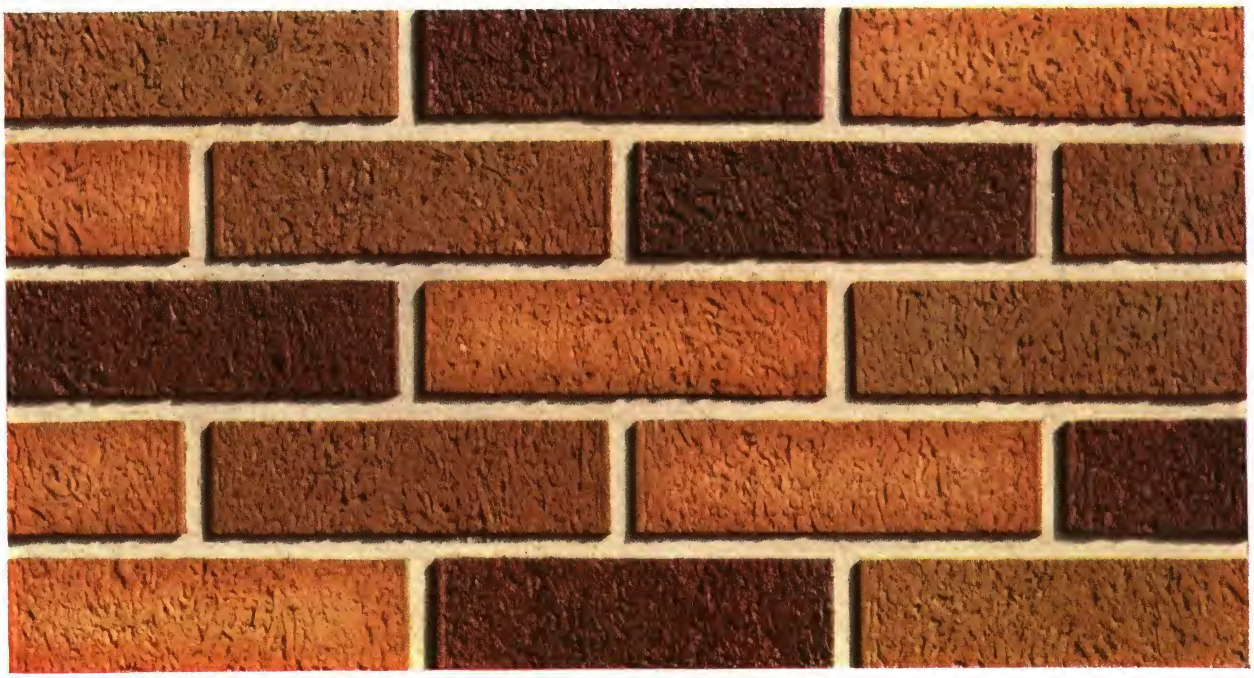
SUGARCREEK SHADE 520

A popular shade of Golden Buffs thoroughly uniform in coloring and adaptable to many architectural styles and uses.



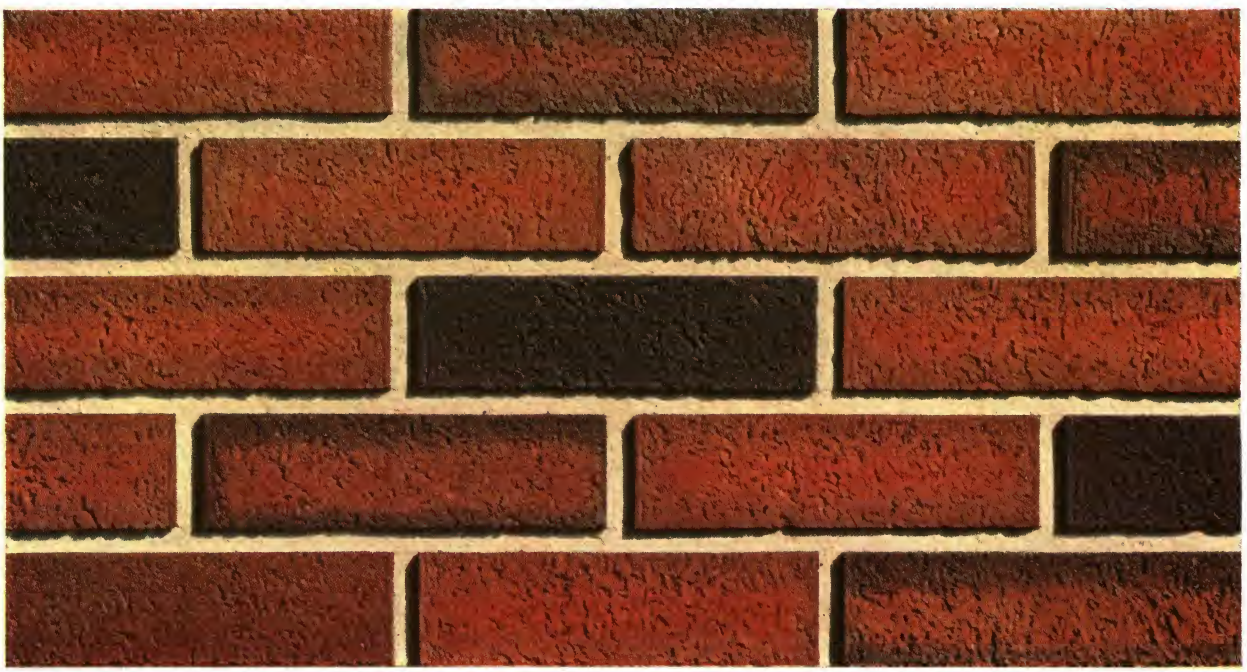
SUGARCREEK RANGE 580

An orange-toned range consisting of several shades of orange, grays, toasted greens and orange polychromes. Favored for residential work.



SUGARCREEK RANGE 590B

A range of browns including tobacco and chocolate mingled with a range of varied tangerines. Suitable for residence work.



SUGARCREEK RANGE 600

A conservative range of dark reds including deep reds, red hearts and some blues. A splendid range for educational buildings and universities.

WESTERN BRICK COMPANY

IN OPERATION SINCE 1900

Manufacturers of Face Brick, Clay Products and Haydite, the Lightweight Aggregate and Featherweight Building Unit

OFFICE AND FACTORIES
DANVILLE, ILL.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Facilities

Capacity—15,000 carloads annually.

Raw Materials—Shales and clays with coal to burn them in inexhaustible supply on our own property adjacent to our plants.

Three Plants—Shipping over seven railroads.

TRADE-MARK

Face Brick

In all colors and textures, including an entirely new line of moulded brick in handmade effects.

Cloister Line

Smooth, lightly sanded surface; in all shale and usual clay colors; reds, browns, blacks and grays—a uniform brick.

Western Moulded Line

A natural brick—producing the handmade effect without excessive cost, in four distinct blends:

Old English—A delightful blend of soft reds and browns.

Gragreen—Pastel shades of gray, green and salmon.

Golden Gray—Buff and tans.

Empire Line

Vertically-scored texture face brick in all colors.

Westex Line

A matte-faced brick in all colors.

Stippled Line

A stippled-faced brick in all colors.

Blends

Mossblende—Ranging through purple, green, buff, chocolate and red—in stippled texture.

Chicago Blend—Olive buff to pinkish red, giving a noticeable pink undertone—in the stippled and matte textures.

Old Italian Cloister—Ranging through gray, buff and pink—in the smooth, sanded texture.

Spanish Homespuns—Wider range through the colors of Old Italian Cloisters—in smooth, sanded texture.

October Blend—Reproduction of the wonderful colors of autumn foliage—in the stippled texture.

Country Club Blend—One of our latest designs in the matte texture, combining black, brown, green, buff and red in an exceptionally desirable blend.

Nine Seventy Blend—Ranging from nearly black through the browns, gunmetals and red—in stippled texture.

University Blend—Combination of black, light browns, purples and dark reds—in the smooth, sanded texture.

Haydite

For Haydite, the ideal lightweight aggregate for concrete and Haydite Featherweight Building Unit, see the pages of the Haydite Manufacturers' Association in this catalogue.

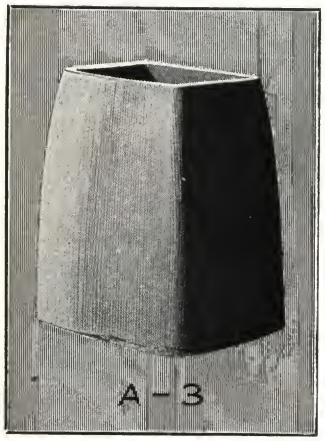
Literature upon request.

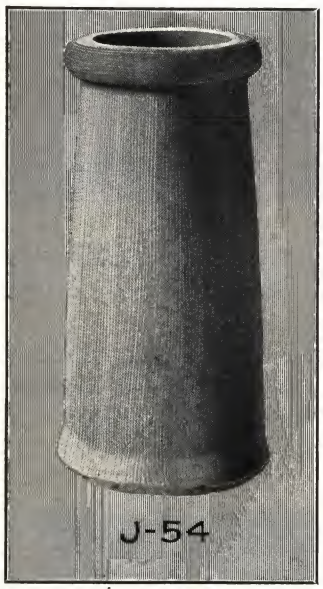
ESTABLISHED 1810

GALLOWAY TERRA COTTA COMPANY

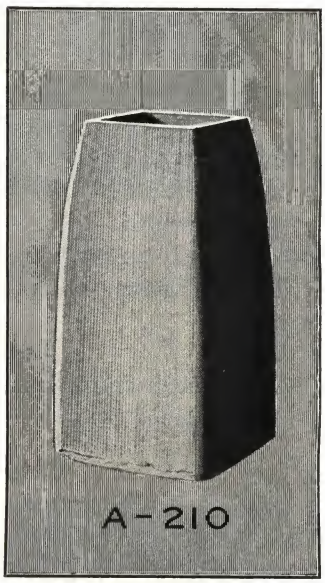
3200 Walnut Street, PHILADELPHIA, PA.

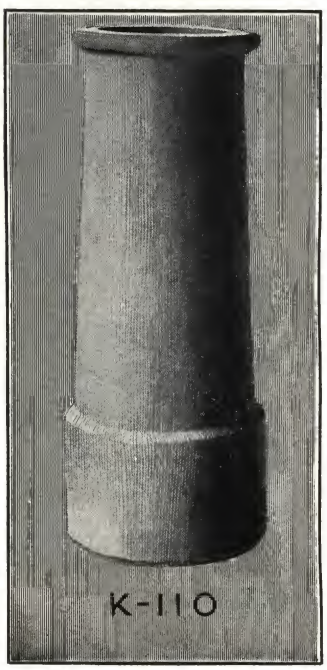
For Galloway Garden and Decorative Pottery and Terra Cotta, see Manufacturers' Index





GALLOWAY
Hand Made
CHIMNEY POTS





Artistic and Practical Value of Chimney Pots

The roof attains additional interest in line and color when topped by Galloway Chimney Pots. Usually the most conspicuous feature of a country house, the roof deserves special consideration. Galloway Chimney Pots not only have practical value, but achieve striking effects at moderate cost.

Galloway Hand Made Chimney Pots

Galloway Hand Made Chimney Pots are made of high-fired, strong, durable terra cotta. They improve drafts, prevent rain water from washing down the flues and afford a simple method of increasing the chimney height without adding brick or stonework. Furnished in a wide range of types and sizes.

Color—The usual finish is a medium shade of red, but gray, buff and other colors will be made on order. Special designs, colors and sizes, other than those illustrated or described, can be furnished to order.

Estimates—In writing for quotations please give flue sizes, quantities and, if possible, a plan of the flues showing distances between them. If ordered a little in advance of the time when they will be needed, unnecessary delays will be avoided, particularly when special work must be executed.

GALLOWAY HAND MADE CHIMNEY POTS

No.	Outside base size, in.	Shape of base	Inside top size, in.	Height, in.
		Type A-3		
68	12 x12	Square	7 x 7	18
3	12 x16	Rectangular	7 x11	18
4	16 x16	Square	11 x11	18
		Type A-210		
210	13 x13	Square	7½x 7½	24
211	13 x16½	Rectangular	7½x11½	24
212	16½x16½	Square	11½x11½	24
213	16 x21	Rectangular	11 x16	24
214	21 x21	Square	16 x16	24
		Type A-252		
250	14	Round	8	22
251	16	Round	10	22
252	19	Round	13	22
253	21	Round	15	22
		Types J-114 and J-54		
54	15	Round	11	30
475	15	Round	11	24
542	20	Round	14	30
5421	20	Round	14	36
114	14x18	Oval	8x11½	25

Note: Type J—Pot in other sizes 22, 24 and 30 in. diameter; 24 to 48 in. high.

		Type K-110		
26	12½	Round	6½	27
110	14	Round	9	36
		Miscellaneous		
41	12x12	Round with square base	6½	36
305	16½x16½	Round with square base	10	30
310	14	Round	8	30

THE PURSELL COMPANY

CINCINNATI, OHIO

PURSELL "HAND FASHIONED" CHIMNEY TOPS

Design No. 1006

Add Beauty to Fine Structures

Pursell Tops are designed to beautify the skyline—to give that final touch of character. They are finished by hand, producing artistic effects which can be secured by no other process of manufacture.

Designs Available From Stock

A comprehensive stock of tops is carried in our standard color, Old Ivory, but they can also be furnished in Rhone Red, Plymouth Grey or Powder Black, on order.

Service to Architects

Where chimney tops of special design are desired, we are able to manufacture them to the architects' design as well as assisting him in developing the design. Our complete facilities enable us to build the tops to order at prices that are reasonable.

Design No. 1007

Design No. 1008

Design No. 1010

Design No. 1020

Design No. 1021

DESIGNS AND SIZES

Design	Flue lining, in.	Bottom, Outside, in.	Height, in.	Approx. ship wt. lb.
1002A	8½ x 8½	12½ x12	14	60
1002B	8½ x13	16½ x12	16	75
1003	13 x13	18 x18	34	250
1004	10 rd. ins.	14¼ diam.	21	100
1005A	8½ x8½	12½ x12½	12¼	50
1005B	8½ x13	12 x17¼	14¼	75
1005C	13 x13	17¾ x17¾	14¾	93
1005D	13 x18	18 x21¾	16¼	128
1006A	8½ x 8½	12½ x12½	27¼	105
1006B	8½ x13	12½ x18	31½	180
1006C	13 x13	17 x17	33	228
1006D	13 x18	17¼ x21½	36	278
1006E	18 x18	21¼ x21¼	37	320
1007A	8½ x 8½	12½ x12½	27½	98
1007B	8½ x13	17¾ x12½	30¼	150
1007C	13 x13	18 x18	34	168
1007D	13 x18	17 x22	36	248
1008A	8½ x 8½	12¾ x12¾	21	100
1008B	8½ x13	12½ x18	25	120
1008C	13 x13	17¼ x17¼	28½	183
1008D	13 x18	17½ x21½	30½	255
1008E	22 x22	25¼ x25¼	24¼	300
1008F	22 x22	29½ x29½	28	340
1009A	8½ x 8½	12 x12	18½	90
1009B	8½ x13	12½ x17¾	22¾	110
1009C	13 x13	18 x18	26½	175
1009D	13 x18	13½ x22	30½	255
1010A	8½ x 8½	13 x13	20½	90
1010B	8½ x13	12¼ x17½	24	135
1010C	13 x13	17¼ x17¼	28¼	150
1010D	13 x18	18 x22¼	33¾	240
1011A	8½ x 8½	12½ x12½	29	125
1011B	8½ x13	12¼ x17½	29	160
1011C	13 x13	17¼ x17¼	29	195
1011D	13 x18	18 x23	29	255
1011E	18 x18	21¼ x21¼	29	295
1012A	8½ x 8½	12¼ x12¼	25	110
1012C	13½ x13½	17¾ x17¾	25	175
1013A	8½ x8½ or 12 rd. ins.	17 diam.	22	120
1013B	13 x18	16 x21¼	22	145
1013C	13x13 or 18 rd. ins.	25 diam.	22	170
1013D	18 x18	26¼ x21½	22	200
1014A	8½ x8½ or 12 ins.	19 diam.	36½	275
1014B	8½ x13	12½ x17½	25½	145
1014BB	8½ x13	12¾ x18¼	33¾	200
1014D	13 x18	19¾ x24	26¼	220
1020A	8½ x 8½	13 x13	27¾	105
1020B	8½ x13	13 x17	29	180
1020C	13 x13	19¼ x19¾	31¾	228
1020D	13 x18	18¾ x20¾	37	280
1021A	8½ x 8½	13½ x13½	30½	180
1021B	8½ x13	13¾ x17½	34½	210
1021C	13 x13	19¾ x19¾	37	260
1021D	13 x18	19½ x21½	43½	310
1022A	18x18 or 18 rd. ins.	28 diam.	33	325
1022B	18x18 or 20 rd. ins.	30¼ diam.	36	370
1023	18x18 or 20 rd. ins.	30 diam.	36	370
1024	13x13 or 15 rd. ins.	20 diam.	46	400
1025	18x18 or 20 rd. ins.	29 diam.	45½	500
1026	8½ x 8½	15 Oct.	46½	375
1027	20 x20	26¼ x29	53	440
1028	20x20 or 24 rd. ins.	32 diam.	70½	700
1029	20 x20	22½ x22½	38½	390
1030A	20x20 or 20 rd. ins.	33¼ diam.	48	525
1030C	20x20 or 20 rd. ins.	33¼ diam.	59	650
1030E	18x18 or 18 rd. ins.	26 diam.	63	600

INDIANA LIMESTONE COMPANY

Producers and Fabricators of Indiana Limestone

GENERAL OFFICES AND ARCHITECTS' SERVICE BUREAU
BEDFORD, INDIANA

EXECUTIVE OFFICES: Tribune Tower, CHICAGO, ILL.

BRANCH OFFICES

ATLANTA, GA., 1202 Boulevard N. E.
BEDFORD, IND.
CHICAGO, ILL., 1317 Tribune Tower
CLEVELAND, OHIO, 1503 Builders' Exchange
DALLAS, TEX., 1508 Magnolia Building
DETROIT, MICH., 2040 Book Tower
KANSAS CITY, MO., 715 Midland Building
MINNEAPOLIS, MINN., 860 Rand Tower
PHILADELPHIA, PA., 403-1600 Walnut Street
PITTSBURGH, PA., 710 Chamber of Commerce
ST. LOUIS, MO., 1082 Arcade Building
SAN FRANCISCO, CAL., 470 Monticello
SYRACUSE, N. Y., 705 Onondaga County Savings Bank Building
WASHINGTON, D. C., Colorado Building

INDIANA LIMESTONE CO. OF NEW YORK YORK, INC., 15 East 41st Street, NEW YORK, N. Y.

INDIANA LIMESTONE CO. OF CANADA, LTD.
MONTREAL, QUE., 401 Architects' Building
TORONTO, ONT., 57 Bloor Street West

Indiana (Oolitic) Limestone

Indiana Oolitic Limestone (also called Bedford Stone) is found in commercial quantities only in *Lawrence, Monroe and adjacent Counties, Indiana.*

It is a non-crystalline limestone, characteristically a free-stone. The massive deposits forming the ledges in the hills of Southern Indiana constitute the most remarkable and probably the most useful building stone deposits in the world.

It is found in a variety of standard grades known as Gray, Buff, Variegated, Rustic and Old Gothic listed in detail under a separate heading of "Classification." The Company's quarries also produce many special trade-named varieties of outstanding individual characteristics.

In color it varies in a wide range and mixture of color tones, from a light cream buff to a medium buff; from a light silver gray to a dark bluish gray and mixtures of both buff and gray.

Its permanence and durability have been firmly established by its use over a period of seventy-five (75) years and more in many of the country's most architecturally prominent buildings.

Classification of Indiana Limestone

Select Gray	Statuary Buff	Select Buff
Standard Gray	Variegated	Standard Buff
Rustic Gray	Old Gothic	Rustic Buff
*Special Hard Gray	ILCO Riplstone	*Special Hard Buff

*These grades are select in texture.

The following special grades, universally recognized for many years, are also produced from the quarries of the INDIANA LIMESTONE COMPANY, samples of which will be furnished upon request.

ILCO Baalbek Buff	ILCO P.M. & B. Buff
ILCO Dark Hollow Buff	ILCO P.M. & B. Gray
ILCO Dark Hollow Gray	ILCO P.M. & B. Variegated
ILCO Dark Hollow Variegated	ILCO Riplstone
ILCO Hoosier Buff	ILCO Saks Rustic Buff
ILCO Hoosier Silvery Gray	ILCO Sanders Rustic
ILCO Hoosier Variegated	ILCO University Buff
ILCO Hunter Valley Buff	ILCO University Rustic
ILCO Hunter Valley Gray	ILCO Walsh Buff
ILCO Hunter Valley Variegated	ILCO Walsh Variegated

For complete descriptions of all grades of Indiana Limestone, physical characteristics, surface finishes, specifications for cut stone and setting, prevention of stain, information on waterproofing, structural steel, mortars, cleaning, etc., write to the Architects' Service Bureau, Bedford, Indiana, for its ILCO Specification Manual.

The Company

The Indiana Limestone Company, a Corporation of the State of Indiana, was formed April 19, 1926, and consisted of a merger of twenty-four (24) of the long established, favorably known proven quarries of Indiana Oolitic Limestone from which this dependable stone has been produced for generations. All of the quarries are located within Lawrence and Monroe Counties, Indiana.

The properties and plants acquired by the Indiana Limestone Company include nearly all of the larger Indiana Limestone producing companies located in the Bedford and Bloomington, Indiana, District as follows:

Bowman-King Stone Co.	Imperial Stone Co.
Brooks Cut Stone Co.	Indiana Quarries Co.
Clear Creek Quarries Co.	Inter-State Cut Stone Co.
The Consolidated Stone Co.	Mathers Stone Co.
Crescent Stone Company	W. McMillan & Son
C. D. Donato Cut Stone Co.	The Monroe County Oolitic Stone Co.
Doyle Stone Company	National Stone Co.
The Furst-Kerber Cut Stone Co.	John A. Rowe Cut Stone Co.
Hoadley Stone Co.	Shea & Donnelly Co.
J. Hoadley & Sons Co., Inc.	Star Stone Co.
Hoosier Cut Stone Co.	Struble Cut Stone Co.
Hunter Valley Stone Co.	United Indiana Stone Co.

The merging of these vast limestone interests into one well-financed, effectively managed organization is in line with the whole trend of modern, progressive business, the object of which is to secure all the benefits of organized quantity production together with the efficiency and economy inherent with it.

The principal viewpoint behind the consolidation, borne out by actual experience, is the more effective co-operation with the architectural and building professions, and the production of Indiana Limestone at a price that would make it even more attractive to the public, at the same time setting a higher standard of accuracy and a keener appreciation of the merits of stone in interpreting the spirit of modern art.

Quarry Capacity

The Company owns approximately 6,000 acres of land of which over 1600 acres are proven stone land either now under or available for immediate quarry developments.

The Company has a quarry capacity of 16,000,000 cubic feet per year.

Mill Capacity

The cut stone mills of the Company have an aggregate floor area of 1,312,700 square feet (equivalent to 30 acres) under roof for cutting and fabrication of stone, exclusive of the area of miscellaneous and accessory buildings. The mill capacity is 6,000,000 cubic feet of sawed stone and well over 4,000,000 cubic feet of cut stone per year.

Production Facilities

With millions of dollars invested in modern machinery, equipment, buildings and a network of railway tracks, the Company's entire production is handled with precision and efficiency, directly comparable with large-scale manufacturing rather than quarrying and fabrication as ordinarily conducted. This enables the Company to assure rapid delivery and unexcelled service, regardless of the quantity of material required, or the size or number of contract operations in work simultaneously.

Sales and Service Facilities

Sales and service offices in charge of experienced representatives are established in the principal centers. They are at all times accessible for effective co-operation. Technically trained service men are available at all times to assist the architectural, engineering and building professions when problems arise concerning the use of Indiana Limestone.

ILCO
SERVICE
INDIANA LIMESTONE COMPANY
BEDFORD ——— INDIANA

Architects' Service Bureau

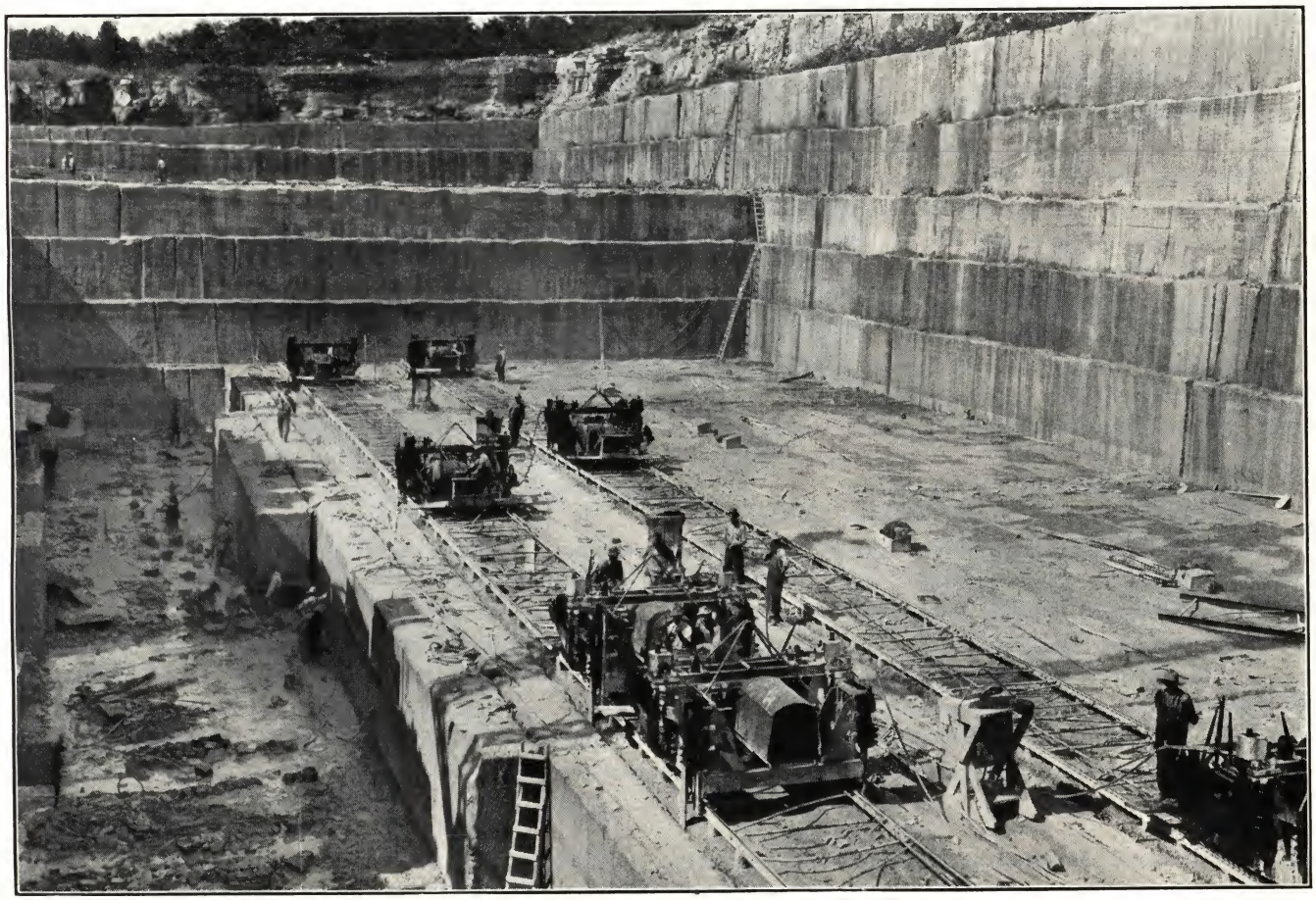
Architects and builders are cordially invited to make free use of the Architects' Bureau, maintained by the Company as a source of reliable information regarding its products and the solution of any problems relating to the structural design and use of Indiana Limestone in building construction. For examples of structural details for ILCO Indiana Limestone exemplifying and illustrating the best in recommended practice see "ILCO Details" published and distributed by the Architects' Service Bureau, Bedford, Indiana.

Copies of the ILCO Specification Manual, referred to on preceding page, may be obtained upon request.

"ILCO News," a monthly rotogravure newspaper, features the architectural spirit of today—ask to be placed on our mailing list.

If interested in building houses, write for new volume entitled, "Distinctive Homes of ILCO Riplstone."

Many technical bulletins on cements, waterproofing, cleaning, etc., in connection with the use of Indiana Limestone, are available and may be obtained promptly upon request.



Ledge at the Indiana Limestone Company's Dark Hollow Quarry

The largest single ledge in operation in the Limestone district, measuring 1400 ft. long, 140 ft. wide, 60 ft. deep. This will cube 11,760,000 ft.; approximately 20,000 large car loads of Indiana Limestone

BUILDING STONE ASSOCIATION OF INDIANA, INC.

Box 54, BLOOMINGTON, INDIANA

MEMBERS

BEDFORD CUT STONE CO.
BLOOMINGTON LIMESTONE CO.
EMPIRE STONE CO.
CARL FURST CO.
B. G. HOADLEY QUARRIES, INC.
HARDING & COGSWELL, INC.
INDIAN HILL STONE CO.
INDEPENDENT LIMESTONE CO.
MATTHEWS BROTHERS CO.
MONON STONE CO.
MUTUAL OOLITIC CUT STONE CO.
SHAWNEE STONE CO.
SWENSON STONE CO.
VICTOR OOLITIC STONE CO.
H. A. WOOLERY & SON

INDIANA LIMESTONE

Product

Indiana Limestone is produced by the members of this Association in a considerable range of color-tone from a light buff, almost white, to a medium gray of slightly bluish cast. It is graded by the members of this Association according to color and texture under the classification officially adopted by the Indiana Limestone Institute, embracing the following regular grades:

Select Buff	Select Gray	Special Hard Buff
Standard Buff	Standard Gray	Special Hard Gray
Rustic Buff	Rustic Gray	Variegated
Buff Statuary Stock		Old Gothic

In addition to these regular grades, the members of this Association produce a number of trade-named varieties that are marketed as specialties by reason of some distinctive characteristic in texture or color-tone.

Indiana Limestone by years of usage in many of the finest buildings of America, including numerous United States Government Buildings, has, by reason of its beauty and fine weathering properties under all conditions of exposure, very generally become recognized as one of America's premier building stones—always moderate in cost, although thoroughly permanent and superior both in its structural qualities and esthetic characteristics.

Indiana Limestone has probably contributed more buildings of distinction and worth to the notable structures of America than any other individual building stone, or other type of exterior building material.

Purpose of the Association

This Association has been organized by the operators listed above as an information and service Bureau for the industry here. Its activities will be conducted along lines similar to those of the former Indiana Limestone Quarrymen's Association.

It will be the earnest effort of this organization to serve the architectural profession and building public in every way possible to insure the most satisfactory and economical use of this stone in all types of construction. *No sales—service only.*

Mills and Quarries, Facilities and Equipment of Members

Our members own over 2,950 acres of proven stone land, of which only 130 acres are now under active quarry development.

As some of the older quarries of the district are gradually approaching depletion, the center of the Oolitic Limestone District has been moving northward into Monroe County where these quarries are located and where practically all of the more recent quarry developments of the district occur. Bloomington is the main shipping point and the present center of production in Monroe County.

The present annual output of the quarry producer members of this Association is about 6,000,000 cu. ft. The maximum output with present equipment is well over 10,000,000 cu. ft.

The approximate annual sawing capacity is about 5,000,000 cu. ft.

The estimated present cut stone production of association members is approximately 2,000,000 cu. ft., the maximum cut stone capacity with present equipment being well over 2,500,000 cu. ft.

The Indiana Limestone Deposit

The oolitic limestone deposit of Indiana is confined within an area extending north and south for about sixty-five miles and east and west less than twenty miles, which for the most part lies in Monroe and Lawrence Counties.

For many years a peculiar fallacy prevailed among architects that the Limestone deposit in Lawrence County possessed physical properties superior to that in Monroe County.

It was no uncommon experience for the cut stone contractor to find "Bedford Limestone" or "Limestone from the quarries of Lawrence County" specified for some particular project.

This apparent handicap, while acting temporarily as a barrier to unrestricted production in Monroe County, has proved an unqualified boon to this county, for the choicest classes of Indiana Limestone have thus been conserved to this part of the quarry district.

Estimates

Plans and specifications sent to the district for estimates, if sent either to the office of this Association or to the office of the Cut Stone Association of Indiana, will be made available to the firms listed above.

SHAWNEE STONE COMPANY

SUCCESSORS TO CENTRAL OOLITIC STONE COMPANY

Indiana Limestone

GENERAL OFFICES, QUARRY AND MILLS
BLOOMINGTON, IND.

Shawnee Carrara Two-Tone

A special Indiana Limestone of statuary texture combining blended tints of creamy buff and light blue, particularly adaptable for bank, office and monumental buildings.

Produced solely by this company.

Shawnee Oriental

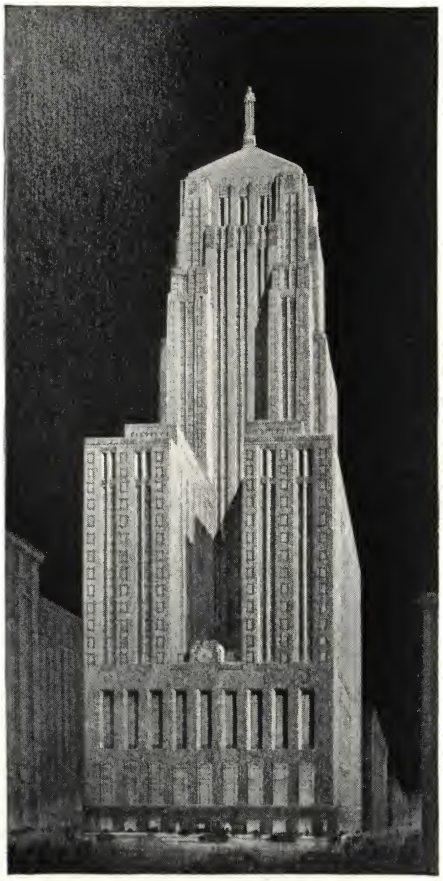
Of rustic texture, with gradations from a light to a dark buff with occasional veins of golden tan and light blue, Shawnee Oriental when used for ashlar walls affords a most pleasing color effect. Can be supplied sawn in strips to required heights which can be economically jointed on the job.

Quality

It is a policy of this company to see to it that no stone leaves its mill which is not executed in a workmanlike manner. With officials of the company at all times supervising operations and with all of our stone coming from but one quarry, builders can be assured not only of unquestionable workmanship but of stone both in color and texture in strict conformity with approved sample submitted.

Quarry

Located in the heart of the Indiana Limestone District with unsurpassed railroad facilities, producing annually in excess of one million cubic feet of Indiana Limestone in all of its various grades as the same are classified by the Building Stone Association of Indiana.



Chicago Board of Trade
HOLABIRD & ROOT, Architects
HEGEMAN-HARRIS CO., Contractors

Facilities

With a mill entirely enclosed employing the latest improved electrically operated machinery, together with ample stacking facilities, this company is equipped to promptly and efficiently handle contracts of any size.

Samples

To interested parties and prospective buyers will be sent, express prepaid, on request, samples of ordinary size to any part of the United States and Canada.

Estimates

Requests for quotations on stone work are solicited and will be given prompt attention. Plans submitted for figures will be promptly returned.

Co-operative Service

This company has an organization of men thoroughly experienced in their respective lines, and will cheerfully supply information and render service to architects, owners and general contractors when called upon.

REFERENCES—SOME OUTSTANDING INSTALLATIONS

This company has supplied the cut stone for many of the largest and most prominent buildings of the country and points with pride and satisfaction to its references, a number of which follow:

London Guarantee & Accident Insurance Building, Chicago, Ill., Alfred S. Alschuler, Architect
Union Trust Co. Building, Cleveland, Ohio, Graham, Anderson, Probst & White, Chicago, Ill., Architects
S. W. Straus Building, Chicago, Ill., Graham, Anderson, Probst & White, Architects
Illinois Life Insurance Building, Chicago, Ill., Holabird & Roche, Architects
First National Bank, Detroit, Mich., Albert Kahn, Architect
Washington Building, Washington, D. C., Coolidge, Shepley, Bullfinch & Abbott, Boston, Mass., Architects
City Hall, Columbus, Ohio, Allied Architects Association, Architects
Mutual Life Insurance Building, Baltimore, Md., Parker, Thomas & Rice, Boston, Mass., Architects
Memorial Union and Tripp Commons Building, Madison, Wis., Arthur Peabody, Architect
Houston National Bank, Houston, Tex., Hedrich & Gottlieb, Architects
Central Row Building, Hartford, Conn., Voorhees, Gmelin & Walker, New York, N. Y., Architects
New York State Office Building, Albany, N. Y., New York Commissioner of Architecture, Albany, N. Y., Architect
A. E. Staley Administration Building, Decatur, Ill., Aschauer & Waggoner, Architects
Scottish Rite Temple, Moline, Ill., Wm. H. Schulzke, Architect
Chicago Board of Trade, Chicago, Ill., Holabird & Root, Architects
Jewel Tea Company, Barrington, Ill., Holabird & Root, Chicago, Ill., Architects
Museum of Science and Industry, Chicago, Ill., Graham, Anderson, Probst & White, Architects
Bell Telephone Building, Louisville, Ky., Marye, Alger & Vinour, Architects

VICTOR OOLITIC STONE CO.

Producers of Victor Buff Limestone

BLOOMINGTON, IND.

Products

VICTOR BUFF INDIANA LIMESTONE. Grades: Statuary Buff, Select Buff, Standard Buff, Rustic, and University Blend.

Victor Buff

Beauty and Attractiveness of Material—Victor Buff, in all grades, is of creamy light tint and may be identified as the only type of Indiana Limestone to possess "color" as distinguished from "shade." This warm tinge of buff in white affords one of the most attractive divisions of the spectrum.

Adaptability to Design—Its qualification of uniform lightness in Select, Standard and Rustic grades renders it particularly desirable where emphasis is placed on architectural line or carving detail. There is no "dappling" to disguise line or architectural design. Its lightness of shade makes it further responsive to exterior floodlighting.

Where variation in shadings is desired, we suggest "University Blend" which combines all shades of white, cream, tan, buff, in the three grades of Select, Standard and Rustic. This variation of coarse and fine textured stone accentuates the blend of color shadings. Where extreme variety is desired, gray and blue limestone is included, but in such small amounts as to only emphasize the brightness and attractiveness of the major buff expression.

Durability — Physical and Visual — The United States Government lists Indiana Limestone as one of the most weather-resistant of building materials. The attractiveness of Victor Buff is unusually time-resistant because of its lightness of shade and fineness of grain; qualities which permit a minimum of lodgement for soot and dust.

Price—Buff as a class raw material has, for seventy-three years, been quoted at a premium over blue, or gray, or variegated. However, cut stone bids, based on our raw material are frequently lower than similar estimates figuring the cheaper grades; this is largely due to the economy of processing Victor Buff.

If you specify the best, be willing to pay for it. Do not squeeze General Contractors, or Sub-contractors until a premium is established on the substitution of inferior materials for the grade you wish. This last is impossible where Victor is specified.

Availability—The reserve of this beautiful stone is unlimited in the Victor properties. For thousands of years Victor will be able to produce the same quality of delicate cream buff, and Victor structures may be readily duplicated in color and texture in years to come.

Victor equipment now gives a capacity of 3,000,000 cu. ft. of cream Buff annually and that figure can be tripled on 90 days' notice. Three-quarter million cubic feet are maintained in storage stocks for immediate shipment.

A Guarantee of Quality to Architects—When an architect specifies Victor for his Indiana Limestone, he gets exactly the grade of stone he wishes. There is no opportunity or possibility of the cut stone contractor buying and processing Standard for a Select specification, or Rustic for a Standard specification. We check every block of rough stone out of the quarry and every piece of cut stone into the building.

Remember that Victor is not in the cut stone business and the stiffer the specification, the more benefit and profit to Victor. Victor is the largest producer in the Indiana Limestone business not owning or operating cut stone plants. This fact is your guarantee of quality.

Disciples of Divinity Church, Chicago, Ill.
HENRY HOLSMAN, Architect

Victor "Tapestry"

The oldest of the Indiana Limestone oolitic deposits; hard enough to take a high polish. In pleasant colors of cream, tan, and brown; a true travertine structure, quarriable in all sizes or dimensions and suitable for all the softer marble purposes. Sawed and worked in the same thickness as other marbles.

A Few of the Many Victor Buff Structures in North America

Mutual Life Insurance Co. Building, Newark, N. J.
U. S. Post Office, Yonkers, N. Y.
First National Bank, Bayshore, L. I., N. Y.
First National Bank, Mobile, Ala.
Seventh Avenue Apartment Hotel, Nashville, Tenn.
Presbyterian Church, Beaver Falls, Pa.
Church of Immaculate Conception, Germantown, Pa.
City Hall and Annex, Philadelphia, Pa.
Rose of Lima Church, Philadelphia, Pa.
Providence High School, Chicago, Ill.
Northwest State Bank, Chicago, Ill.
Presbyterian Theological Seminary, Chicago, Ill.—The Commons and Gymnasium
Westminster Church, Chicago, Ill.
War Memorial and Boldt Tower, Cornell University, Ithaca, N. Y.
Lying-In Hospital, University of Chicago
U. S. Post Office, Louisville, Ky.
Oriental Institute Building, University of Chicago
Circle Tower Building, Indianapolis, Ind.
West City Bank, Chicago, Ill.
Delmonico Hotel, New York, N. Y.
Louisiana State University Medical Center, New Orleans, La.
School Administration Building, Philadelphia, Pa.
Central National Tower, Battle Creek, Mich.
Cincinnati Times Star Building, Cincinnati, Ohio

ARCHITECTURAL GRANITE

VAHAN HAGOPIAN

NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION, INC., BOSTON, MASS.

FOREWORD

The widespread introduction of machine processes during the past decade has practically revolutionized the granite industry. This has resulted in speeding up production, substantial reductions in cost and new possibilities for economic use.

The transition from slow, expensive hand work to speedy, efficient machine production is still under way, and promises even greater development for the future. Knowledge of what has and can be done in the production and finishing of granite for architectural purposes is more essential now than ever before if full advantage is to be taken of its aesthetic and economic possibilities.

This catalogue has been prepared as one of the services of the Association to provide architects, designers, specification writers and prospective users of granite with up-to-date information. Certain facts are also presented relative to the Association, its members and their granites which we believe will be informative and useful. Much of the information is general in application to practically all granites, but the descriptions and listings of specific granites are confined to those quarried and manufactured by member companies.

Architects and prospective users of granite are invited to make free use of the many services of the Association. These services represent the combined information and experience of the industry and are made possible by the co-operation and support of a representative group of granite producers who believe that such services are beneficial alike to architects, users and producers of granite.

In addition to this catalogue in SWEET'S, the Association has published in booklet form a similar catalogue entitled "Architectural Granite," reprinted from the 1931 Edition of SWEET'S ARCHITECTURAL CATALOGUES, and containing color reproductions of the granites listed here. This booklet will be sent free upon request.

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PRODUCTS OF MEMBER COMPANIES

GRANITE—Rough, Dressed and Polished—for Commercial, Public, Monumental and Residential Buildings; for Memorials, Ornamental Public Improvements, Landscape Work, Mausoleums and Monuments.

GRANITE—Rough and Dressed—for Bridges, Dry Docks, Sea Walls, Foundations and similar construction.

GRANITE—Ashlar, Rubble, Flagging, Riprap, etc.

ROCK FACED, SPLIT FACED and SEAM FACED GRANITE.

NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION, INC.

Member of the Producers' Council, Inc.

31 State Street, BOSTON, MASS.

HARRIE H. SHERMAN, Secretary

F. FAIRFIELD McCANN, Field Representative

LIST OF MEMBERS

BOOTH BROS. & HURRICANE ISLE GRANITE CO.
New York, N. Y., 208 Broadway
Branch Office, New London, Conn.

COOK, WATKINS & PATCH, INC.
Boston, Mass., 221 Columbus Avenue
Plants at Barre, Vt.

JOHN L. GOSS CORPORATION
Stonington, Me.
Sales Office, Boston, Mass., 77 Summer Street
Sales Agents:
New York, N. Y., 286 Fifth Avenue, A. Le Poidevin & Co., Inc.
Philadelphia, Pa., 2302 Spruce Street, Frank Williamson
Middle Western Territory, Wm. H. Mitchell, 30 Church Street, New York, N. Y.
North Western Territory, Clark H. Grunewald, 314 Eitel Building, Seattle, Wash.
California, Bly Stone Co., 1985 East 16th Street, Los Angeles

GRENCI & ELLIS, INC.
Peekskill, N. Y.
Branch Offices:
New York, N. Y., 501 Fifth Avenue
Frankfort, Me.

THE HARRIS GRANITE QUARRIES CO.
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Western Sales Representative, J. M. Batchelder, Dixon, Ill.

KITTREDGE QUARRIES
Milford, N. H.

L. LUCHINI & SON
Milford, Mass.

MAINE & NEW HAMPSHIRE GRANITE CORP'N
North Jay, Me.
Branch Offices:
Redstone, N. H.
New York, N. Y., 100 East 42nd Street
Philadelphia, Pa., 1511 Real Estate Trust Building
Chicago, Ill., 43 East Ohio Street
Geo. B. Jameson, Representative
Pittsburgh, Pa., 725 Grant Building
Willis Dalzell Co., Representative

MOUNT AIRY GRANITE CUTTING COMPANY
Mount Airy, N. C.

THE NORTH CAROLINA GRANITE CORP'N
Mount Airy, N. C.
Branch Offices:
Chicago, Ill., 127 No. Dearborn Street
Charles H. Gall, Representative
Philadelphia, Pa., 1001 Witherspoon Building
Pittsburgh, Pa., 207 Fulton Building
Chas. M. Tiernan, Representative

NORTH STATE GRANITE CO.
Mount Airy, N. C.

PROVIDENCE GRANITE COMPANY
Providence, R. I., 210 Kinsley Avenue

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Chas. M. Tiernan, Representative

THE JOHN SWENSON GRANITE COMPANY
Concord, N. H.
Branch Offices:
New York, N. Y., 101 Park Avenue
F. A. Fichtel, Representative
Chicago, Ill., Builders Building
Herbert T. Rich, Representative
Detroit, Mich., 2270 Penobscot Building
J. W. Rollinson, Representative
Cleveland, Ohio, 414 Newman-Stern Building
Exum M. Haas, Representative

ALEXANDER THOMSON, INC.
Providence, R. I., Allens Avenue and Seymour Street
Branch Office, Cambridge, Mass., 36 Albany Street

WOODBURY GRANITE CO., INC.
Burlington, Vt.

ASSOCIATE MEMBERS

PERRY BROS. GRANITE CO., CONCORD, N. H.

A. LE POIDEVIN & CO., INC., 286 Fifth Avenue, NEW YORK, N. Y.

INFORMATION REGARDING THE ASSOCIATION OF INTEREST TO THE ARCHITECT AND SPECIFICATION WRITER

The Association and Its Purpose

The chief aim of this Association is to further the use and sale of granite for building purposes by extending the knowledge of its many qualities and merits, and by establishing means of closer co-operation between producers of granite and architects and general building public.

Real Service to Architects

The Association, through its Research and Information Bureau and its field men, offers a convenient and unbiased service to architects and others interested in the use of granite for permanent construction.

This service is freely offered wherever it may assist in the logical and proper use of granite or help to solve the economic and aesthetic problems which may arise when the use of granite is under consideration.

Research and Information Bureau

This department has been developed to collect and disseminate useful and reliable information concerning granite. This information is being gathered constantly from within and without the industry and the Association has become the clearing house for the best information available. Study and research is being carried on concerning the different granites available for architectural uses, the chemical and physical properties of granite, problems in economic detailing and production, experience and good practice in actual use.

Architects, and others interested in the use of granite, are invited to make use of the services of this department freely and all requests for information pertaining to granite will receive willing and careful attention.

Field Service of the Association

Qualified representatives of the Association are in the field calling upon architects for the purpose of making available the facts and information accumulated by the Research and Information Bureau. Timely and unbiased information may be had through the field service. Economic points as to design, detail and specification of granite work may be discussed and quickly settled.

The field men will be glad, when requested, to obtain information which may not be immediately available, and to assist the architect and specification writer in every way possible in connection with the use of granite.

The Association can render most valuable service when a project is in its preliminary or initial stages. The architect need not hesitate to discuss a project with our representative at any time, and if for any reason he wishes to avoid premature publicity he need only so indicate and the matter will be treated as strictly confidential until such time as information may be properly reported to our member companies.

Service of Representatives of Member Companies

The member companies of the Association maintain sales offices and representatives in many of the larger cities. These men are experts on granite and well qualified to render definite and valuable services to architects and specification writers in their districts.

Accurate and reliable information may be secured by consulting these representatives when any specific project is under consideration, and they are always willing to furnish samples of their granites or to submit preliminary or final estimates upon specific work.

Permanent Exhibits of Granite and Finishes

The Association maintains permanent exhibits of the various standard building granites, produced by its member companies, at the following convenient addresses:

Architects Samples Corp., 101 Park Avenue, New York
Master Stone Cutters Assn., Architects Building, 17th and Sansome Streets, Philadelphia
National Building Granite Quarries Association, Inc., 31 State Street, Boston

Here will be found the various colors and textures from which architects may make selections of granite for any specific project. Here also are displayed complete sets of samples illustrating the regular building granite finishes, which the Association has adopted as standard. The selection and specification of finish for any specific job by reference to these standards, will assure definite and mutual understanding as to just what is wanted.

A model "Study in Granite" is included in the New York exhibit, illustrating the possibilities of combining various colors and textures, using standard granites.

Architects and the general building public are invited to inspect these exhibits when considering the selection of materials or finish.

Securing Estimates and Samples

The Association does not quote prices, but requests for preliminary or final estimates on granite work will be transmitted to interested members and estimates promptly obtained.

Plans and specifications for specific work may be sent in to the Association office and made available to its members for estimating purposes. Architects and contractors are invited to avail themselves of this service, which has proved its value and frequently produces bids which might not otherwise have been secured.

Requests for samples will be transmitted to members producing the kind and quality of granite desired, and information will be furnished as to where specific colors and qualities of granite may be obtained, whether produced by Association members or non-members.

The Association Code of Ethics

The Association stands for fair practice in bidding and advocates that bids, tendered in good faith in accordance with plans and specifications, should be fairly considered and used, both as a matter of principle and in order that the best interests of all may be assured.

Uniform Proposal and Contract Forms

Uniform Proposal and Contract Forms for granite work have been prepared and adopted by the Association. The terms and conditions are fairly standardized and the equity of both parties has been studied and protected.

These printed Association forms have been in use for several years and have met successfully the test of application. Two forms of contract are provided, one for the granite work "Set in Place" and one for the work "f.o.b." These Contract Forms are recommended by the Association for general use on granite work, and copies will be sent for inspection upon request.

Responsible Competitive Estimates

The Association, through its reports to members concerning prospective work and bids desired, stimulates competitive bidding, backed up by responsible concerns operating the best organized and equipped plants in the granite industry.

Architects and contractors, who advise the Association concerning bids desired, undoubtedly will secure a larger number of responsible, competitive bids, with a minimum of effort and expense. Requests for bids, with information as to closing dates, are transmitted to the member companies upon receipt, and bids are sent direct to architect or contractor by those bidding.

The Association has no control over or responsibility for prices made or quoted by its members, and has no knowledge as to who are bidding or the amounts bid until after the bids are delivered and opened by the recipient on the date set for closing.

Financial and Production Responsibility of Individual Members of the Association

To meet successfully the demands of modern building construction, the granite producer must fulfill very definite requirements as to financial responsibility, type of organization, and adequacy of quarries and finishing plants.

Association members have been and are the leaders in developing their financial organization and production facilities to meet these exacting requirements. They can furnish unquestionable references as to past performance and responsibility, and are entitled to preferential consideration wherever building granite is under consideration.

In granite, as in other materials, bids are submitted and contracts undertaken by concerns which lack the experience and ability to execute them satisfactorily, and whose quarries and plants are inadequate to meet the requirements. These facts should be carefully considered when awarding the granite contract. Bids tendered by Association members should receive especial consideration on the ground that contracts based upon them will be satisfactorily executed.

Adequate and Dependable Quarries

In selecting granite for building purposes, the ability of the quarry to produce the quantity, sizes and quality of granite desired is the first essential. The quarry must be so equipped that its output may be handled and shipped at a rate to meet the cutting requirements, not only for the work under consideration, but all the work which may be simultaneously under contract.

The Association quarries, without exception, meet the above requirements. They are all quarries of established reputation and have been developed to meet the requirements of quantity production.

Modern Cutting and Finishing Plants

Granite is delivered to the finishing plant from the quarry in rough blocks—some already split to approximate dimension sizes, and others to be drilled and split to dimension, or sawed into slabs.

Modern building granite plants must be well equipped with up-to-date machinery and appliances for handling and manufacturing granite in considerable quantity, efficiently and with first class workmanship.

Included in the essential equipment of a modern granite finishing plant are saws, carborundum machines, polishing machines, pneumatic surfacing machines, turning lathes, sand blast, pneumatic hand and carving tools, and pneumatic drills. The handling equipment must be adequate and speedy, and arranged to serve the producing machinery and hand workers, and to handle the storing and loading, efficiently and safely.

The handling, machinery, sawing and polishing of granite requires power in large quantities. Adequate and dependable power is therefore a most important essential, and adequate blacksmith shops, carpenter shops and repair shops are also necessary accessories to a properly equipped plant.

Handwork is required in finishing the average type of architectural granite work, and a good journeyman granite cutter is one of the most skillful craftsmen in industry today. Modern tools and machinery have relieved this craftsman of a great deal of laborious and time consuming work, but his skill of hand and eye is as indispensable today as when the Egyptians cut their granite temples.

Association plants include the largest and best equipped plants of their kind in the country. They have been established for considerable periods and a "home guard" of skilled workmen has been built up to supply their steady demand for first class men. These are important factors in the superior ability of Association plants to fulfill both the quality and quantity demands for architectural granite work and entitle them to preferential consideration.

Each Member Has An Experienced Organization

Without a properly managed and experienced organization, even an adequate quarry and well equipped finishing plant will not ensure satisfactory execution of contracts.

Association members have built up organizations having the necessary experience and ability to put through whatever they may undertake. Their estimators have the benefit of actual cost figures covering a wide variety of executed work, thereby removing much of the guesswork and chance taking, because of which many a job is skimped and botched. Their draftsmen are the best trained men to be had and their knowledge of practical stereotomy, skill in layout and accuracy in figures may be counted upon to discover, in advance, errors in vital dimensions or impractical points in construction or jointing, thereby avoiding delay and expense to all concerned.

Experienced and practical salesmen constitute a service as well as a sales force, and the co-operation they are able to offer is frequently of no small importance in the securing of reliable preliminary estimates and in consultation as to practical economies possible.

Importance of Proper Planning and Supervision in the Mill

The planning and routing of work through the mill and its consistent and thorough inspection while in process and at completion, due to well trained and experienced plant management, is all reflected in expedited erection at the building and a minimum of interference with progress of work of other trades.

Inadequate or inexperienced plant management and supervision usually goes hand in hand with inordinately low bids, and poor workmanship, delayed and muddled deliveries, expensive tie-ups and delays to other trades on the building itself, usually follow as a natural consequence, and more than eat up any supposed savings.

The Association's Relation to Member Companies

The Association is maintained by its member companies as a vital and necessary extension of their individual organizations, to carry on collectively those important services which make for efficiency and economy and are alike beneficial to the users and producers of granite generally.

CLASSIFICATION OF BUILDING GRANITES QUARRIED BY ASSOCIATION MEMBERS

White, Gray, Buff, Lavender, Pink, Red, Green

Name of Granite	Color	Grain	Technical Classification	Location of Quarry	Quarried by
Bethel White	White, faintly mottled with gray	Coarse inclined to medium	Quartz-monzonite.	Bethel, Vt.	Woodbury Granite Co., Inc., Burlington, Vt.
Mount Airy	Very light gray	Medium	Biotite	Mount Airy, N. C.	North Carolina Granite Corp., Mount Airy, N. C.
North Jay	Very light gray	Fine	Biotite-muscovite.	North Jay, Me.	Maine & New Hampshire Granite Corp., North Jay, Me.
Milford, N. H.	Light gray	Fine inclined to medium	Quartz-monzonite.	Milford, N. H.	Kittredge Quarries, Milford, N. H.
Carolina Gray	Light gray, flecked with pink	Medium	Biotite	Granite Quarry, N. C.	The Harris Granite Quarries Co., Salisbury, N. C.
Swenson Gray	Light to medium gray	Fine to medium	Muscovite-biotite.	Concord, N. H.	John Swenson Granite Co., Concord, N. H.
Mount Waldo	Light to medium gray	Medium	Biotite	Frankfort, Me.	Grenci & Ellis, Inc., Peekskill, N. Y.
Woodbury Gray	Medium gray	Medium	Biotite	Woodbury, Vt.	Woodbury Granite Co., Inc., Burlington, Vt.
Barre Building	Light to medium bluish gray	Fine to medium	Biotite	Barre, Vt.	Cut by Cook, Watkins & Patch, Inc., Barre, Vt.
Connecticut White	Medium buff gray, hammers light	Fine	Quartz-monzonite.	Waterford, Conn.	Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York City
Light Mohegan	Light grayish buff	Medium	Muscovite-biotite.	Peekskill, N. Y.	Grenci & Ellis, Inc., Peekskill, N. Y.
Dark Mohegan	Deep yellowish buff	Medium	Muscovite-biotite.	Peekskill, N. Y.	Grenci & Ellis, Inc., Peekskill, N. Y.
Swenson Buff Antique	Light to medium grayish buff	Fine to medium	Muscovite-biotite.	Concord, N. H.	John Swenson Granite Co., Concord, N. H.
Goss Pink Deer Isle	Pinkish, lavender tinted, medium gray	Coarse	Biotite	Crotch Island, Stonington, Me.	John L. Goss Corp., Stonington, Me.
Old Pink Milford	Light to medium pink with black spottings	Medium to coarse	Biotite	Milford, Mass.	L. Luchini & Son, Milford, Mass.
Swenson Pink	Light pink with occasional black waves and pink stripes	Medium to coarse	Biotite	Wells, Me.	John Swenson Granite Co., Concord, N. H.
Conway Pink	Light pink mottled with large dark gray and small black spots	Coarse	Biotite	Redstone, N. H.	Maine & New Hampshire Granite Corp., North Jay, Me.
Somes Sound	Light pinkish buff mottled with gray.	Medium inclined to coarse	Biotite	Mt. Desert, Me.	Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York City
Carolina Pink	Light mottled pink.	Medium inclined to coarse	Biotite	Near Granite Quarry, N. C.	Cut by The Harris Granite Quarries Co., Salisbury, N. C.
Balfour Pink	Light, uniform, slightly purplish pink	Medium	Biotite	Granite Quarry, N. C.	The Harris Granite Quarries Co., Salisbury, N. C.
Jonesboro Red	Medium reddish pink uniformly mottled with smoky quartz and flesh colored feldspar	Coarse inclined to medium	Biotite	Jonesboro, Me.	Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York City
Conway Green	Dark olive green with black spottings	Coarse	Biotite-hornblende.	Redstone, N. H.	Maine & New Hampshire Granite Corp., North Jay, Me.
Carolina Black	Very dark gray, almost black	Medium	Hypersthene gabbro	Near Salisbury, N. C.	The Harris Granite Quarries Co., Salisbury, N. C.

A SERVICE FULFILLING THE RECOMMENDATIONS OF THE AMERICAN INSTITUTE OF ARCHITECTS

Institute Advocates Knowledge of Materials

For a number of years the various chapters of the American Institute of Architects have advocated closer relations between the architect, designer and craftsman, and a more intimate knowledge of materials and methods of working them, so that better architecture may be produced.

Since earliest times granite has been used in the finest of buildings because it combines beauty and durability to an unusual degree. More recently, since cost became such an important factor, the use of granite has often been restricted because of excessive cost over softer, more easily working stones. A better understanding of its exceptional architectural qualifications, and how to adapt design and details to take fullest advantage of its aesthetic qualities and economical methods of cutting, would ordinarily so reduce the cost that the use of granite would be greatly increased.

The greatest asset of the true designer is complete sympathy for and knowledge of the material in which he designs. It is therefore important that both the designer and specification writer be as fully informed as possible concerning granite and its economical working possibilities. To that end this Association offers its services.

Information on Granite Made Available

Several years ago the NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION, INC., decided that all possible information regarding granite and its economic use should be collected and made available to architects and users. This could be done more efficiently by the Association than by individual producers, as it involved considerable expense and, to be of maximum benefit, should be unbiased, continuous and representative of the best experience and practice. The Research and Information Bureau was therefore set up in the Association and a fund of reliable and useful information, heretofore not generally known outside of the industry itself, was made available to architects, designers and specification writers.

GRANITE AND ITS ARCHITECTURAL QUALIFICATIONS

Natural Qualifications

Granite has exceptional strength and durability, is practically non-absorbent, and indefinitely withstands exposure to climate and weather. It is available in a wide range of colors and textures and has inherent beauty and character to be found in few other materials.

Granite may be cut into any form desired and dressed in a great variety of finishes. It takes a high and durable polish which will withstand long exposure to the weather. It may be carved with as much refinement of detail as desired. Granite is pre-eminently suited by nature for exterior architectural uses, and its natural qualifications are unsurpassed and rarely equalled by any other building stone.

Description of Granite

Granite is technically described as a holocrystalline, granular rock of igneous origin. The essential constituents are quartz and a potash feldspar. The principal accessory mineral is usually either mica or hornblende. Other minerals occur in small quantities, but are generally secondary to those mentioned.

The accessory mineral, mica, occurs in two forms—black mica or biotite, and white mica or muscovite. The hornblende in building granite is usually black or a very dark green.

Granites are technically classified by the predominating accessory mineral. The most common varieties of building granites are known as biotite, muscovite, biotite-muscovite, muscovite-biotite, hornblende, biotite-hornblende, and quartz-monzonite granites.

As a general rule the color of granite is determined by that of its feldspars, and the hardness by the quartz and feldspars, varying according to the proportion and hardness of the feldspars.

Colors and Textures—The granites produced by Association members include many shades of gray, lavender, pink, red, green, brown, buff, and white.

Natural texture varies according to the distribution and size of crystals of the constituent minerals. Granite is graded, as to grain, by the size of its feldspar crystals, from very fine to very coarse. The size of crystals or coarseness of grain has practically no bearing on the structural qualities, but gives to granite the variety of texture which adds greatly to its architectural possibilities.

Physical and Chemical Tests

The standard building granites produced by Association members so far exceed all ordinary architectural requirements as to physical and chemical properties, that specific data on physical tests and chemical analyses have little or no bearing upon the relative architectural merits of the different granites.

In confirmation of this, a detailed statement prepared by George F. Loughlin of the United States Geological Survey is on file in the Association office, a copy of which will be mailed on request.

Quality of Material and Workmanship

As noted under "Physical and Chemical Tests," the standard building granites so greatly exceed all possible requirements of architectural use, that standards as to quality of material are unnecessary, other than that they be sound, free from flaws or defects which would impair their strength and from stain or defects which would mar their appearance.

Quality of workmanship has been graded by usage into three classifications, which, while somewhat elastic and difficult to define exactly, are pretty well established and recognized in the trade, as follows:

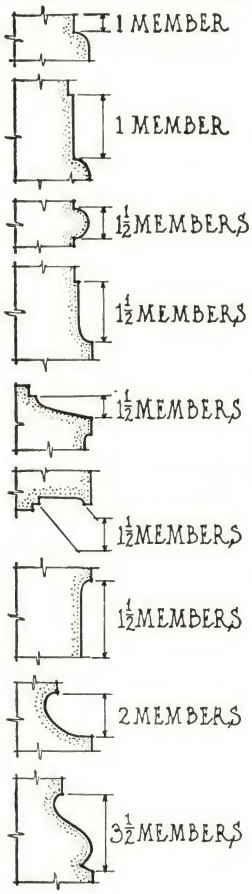
Monumental Building Grade—For permanent buildings designed to perpetuate public pride or civic spirit, where utility and economy are subordinate to architectural merit, such as State house, courthouse, library or public memorial.

Good Commercial Grade—For high class buildings designed both for utility and to express something of the character, dignity and stability of the occupancy, such as banks or insurance buildings, high class office buildings, churches, schools, etc.

Ordinary Commercial Grade—For buildings where architectural appearance is subordinate to utility and governed by economic considerations. Workmanship will meet requirements of structural safety, but not carried beyond the point of a good appearance to the casual observer.

DETAILING FOR GRANITE—THE USE OF THE "MEMBER SYSTEM" IN ESTIMATING COSTS

The use of granite is often restricted because of its cost as compared with freer working stones. The cost of granite need not be so frequently prohibitive if certain facts are considered by the specification writer and the designer. The cutting of mouldings on granite work involves a greater amount of expensive hand labor than on other classes of work. Mouldings lend themselves to reasonable modification and the cost savings possible are well worth careful consideration when detailing for granite. Some knowledge of the method generally used in estimating cost of cutting granite mouldings will give the designer a good idea as to the relative cost importance of moulded details.



The "Member System" for Estimating Granite Mouldings

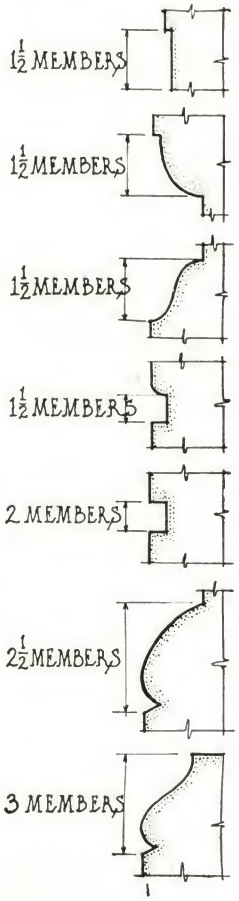
The so-called "Member System" is generally used in estimating cost of cutting granite mouldings.

The profile of a moulded section is first divided into units called "members," a "member" being a more or less arbitrary unit in which the edges, contour, changes in direction and width between edges are taken into consideration.

In counting the number of "members" in any given profile, no hard and fast rules can be laid down, but 4 in. of any contour is the maximum to be counted as a single member. Several basic member counts are illustrated here, and from these practically any ordinary moulded profile may be built up and counted.

To estimate the approximate cost per lineal foot of a moulded profile, multiply number of "members" by the unit of "member" cost per lineal foot and add the cost of plain face displaced by the membered surface at its unit cost per square foot.

The unit cost per lineal foot of "member" varies with grade of granite and finish, as do the unit costs per square foot of plain surface. For approximations, one lineal foot of "member" may be considered equal to a square foot of plain surface for any given granite or finish.



Relative Cost of Plain and Moulded Faces

The cost per lineal foot of a moulded surface, as explained above, is approximately:

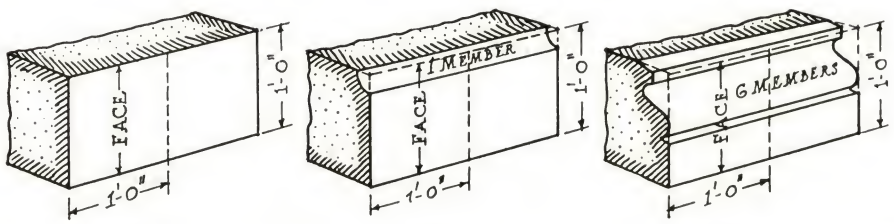
Area of face @ face unit + number of members @ member unit

The example below visualizes the application of this rule in making relative cost comparisons. Three granite sections are shown of equal face area. "A" has no members; "B" has one member; "C" has six members. The relative cost per lineal foot is illustrated by the squares above each section.

COST PER LINEAL FOOT

Assume cutting cost unit for plain face and for members is $1.50. Applying this unit to these examples, the surface cost per lineal foot of "A" = $1.50; "B" = $3.00; "C" = $10.50. From this example the relative cost effect of superfluous "members" is quite apparent.

The designer, when detailing for granite, can quickly apply this principle to any moulded section under consideration.



(A.) (B.) (C.)

PLAIN AND MOULDED SECTIONS OF EQUAL FACE AREA

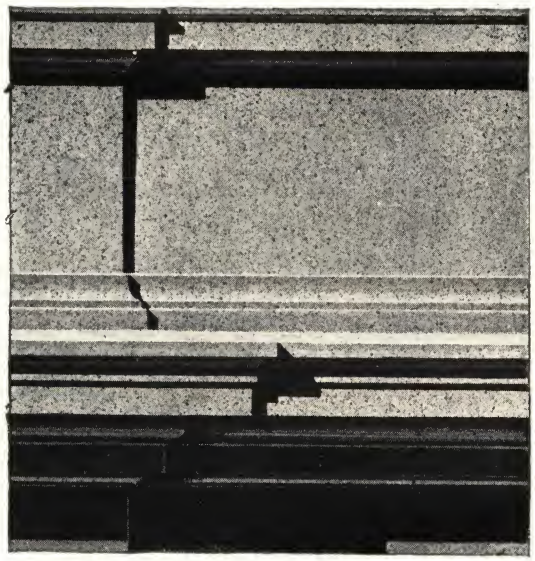
PLATE A

EXAMPLE OF DETAILING FOR GRANITE

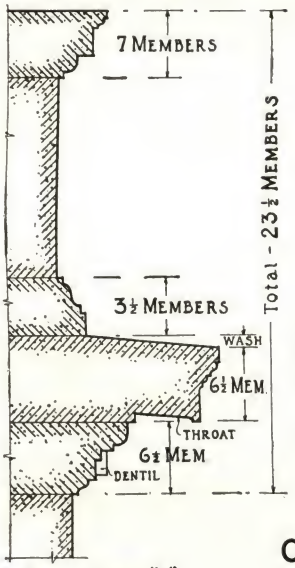
Simplification of Moulding—Applied to Specific Detail

The details below are taken from Plate XXVIII —Studies in Granite, illustrated on page 16. Profile "A" is as originally detailed, while "B" shows suggested modification for economy. The approximate saving is worked out below, showing that intelligent study of granite detail may produce material economies without seriously affecting aesthetic values.

ORIGINAL PROFILE "A"



PROFILE AS MODIFIED "B"



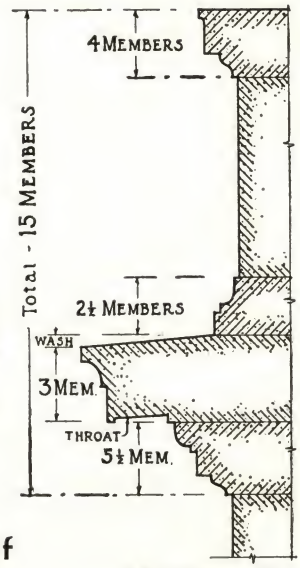
SECTION "A"

Comparison Between the Details Illustrated Showing Difference in Cost Based on the "Member System"

Profile "A" equals 23½ members + dentils
Profile "B" equals 15 members
Saving: "A" — "B" equals 9 members + dentils

Assume that one member costs $1.50 per lineal foot, and dentils at $3.00 each. The approximate saving then is $12.75 for members and $9.00 for dentils, or a total saving of $21.75 per lineal foot.

Apply this to the perimeter of the building and the total speaks for itself.



SECTION "B"

Other Studies and the Co-operation of Members of the Association

The Association has prepared comparative studies in modification of detail for economy, which are published as part of our series of "Studies in Granite" in the form of plates, similar to Plate XXVIII, as follows:

Plate XXVI—Main Entrance to Farnese Palace, Rome.

Plate XXVIII—Entrance to Palazzo Sciara di Carbognano, Rome.

Plate XXX—Entrance to Palazzo Negroni, Rome.

Plate XXXII—Entrance to Casino of Papa Giulio's Vineyard, Rome.

Plate XXXIII—Entrance to Habitation Building, Casino of Papa Giulio.

Plate XXXIV—Window, Casino of Villa di Papa Giulio.

The representatives of the Association, or the local representatives of its various member companies, are always glad to give practical advice, from the granite man's viewpoint, as to best and least expensive types of granite construction and detail.

For the architect to avail himself of this service may save him considerable time and expense in revising shop drawings after bids are taken and costs found to be excessive

PLATE B

DESCRIPTIONS OF GRANITES PRODUCED BY ASSOCIATION MEMBERS

Colors, Textures and Working Qualities

Granites produced by Association members are standard building granites of demonstrated quality. They include a wide range of colors and textures, each granite having its special qualifications for various architectural uses.

The Association has prepared color plates of the granites described below. These, together with general information regarding granite, are published in the Association booket, "Architectural Granite," copy of which will be mailed on request. These color plates are useful for making preliminary selections, but final selections should always be made from actual samples in justice to the granites. It is impossible to reproduce or imitate the real beauty and character of these granites.

Made up of mineral constituents gem-like in quality, some opaque, some translucent and others of glass-like transparency, the true liveliness and penetration of color tones inherent in the actual granites are entirely lacking or but vaguely suggested in color reproductions.

In selecting granite from actual samples or color reproductions, it should be borne in mind that color and tone vary with the different finishes. Polishing brings out and deepens the inherent colors, while hammering lightens and softens the color tone. A pleasing variety of tone effects and contrasts may be had by using different finishes on the same granite. The possibilities of color combinations, using different granites and finishes, are almost unlimited.

Practically all the granites referred to here have been studied by eminent geologists whose findings are published in authoritative official bulletins. In describing the colors, textures and outstanding characteristics of the various granites on this and the following page, these unbiased reports have been utilized and summarized in somewhat comparable form for the convenience of those desiring this information.

BETHEL WHITE

Quarry at **Bethel, Vt.** Quarried and Cut by:
Woodbury Granite Co., Inc., Burlington, Vt.

A strictly white, quartz-monzonite granite faintly mottled with gray, and with coarse inclining to medium grain. Its hammered face is considerably whiter than its rough or polished face and hammering also diminishes the prominence of the gray micaceous spots. Takes a high polish which emphasizes the gray mottling and mica spottings. Is beautifully white in hammered finish and is excellently adapted for fine carving.

MOUNT AIRY

Quarried at **Mount Airy, N.C.**, by:
North Carolina Granite Corp'n, Mount Airy, N. C.
Cut by: **J. D. Sargent Granite Co., Mount Airy, N. C.,**
North State Granite Co., Mount Airy, N. C.
Mount Airy Granite Cutting Co., Mount Airy, N. C.

A very light gray, almost white biotite granite of medium grain. The nearly white background of feldspar is evenly mottled with slightly bluish-gray quartz and uniformly stippled with small biotite crystals, emphasizing the whiteness and giving strong character to the granite. Especially adapted for building work and mausoleums.

NORTH JAY

Quarry at **North Jay, Me.** Quarried and Cut by:
Maine & New Hampshire Granite Corp'n, North Jay, Me.

A very light gray biotite-muscovite granite with fine even grain. Its general whiteness is due to the whiteness of its feldspars and clearness of its quartz. Fine, evenly distributed particles of biotite give life to the granite and emphasize its lightness of color. Its free working qualities, light color and fine grain adapt North Jay Granite equally well to fine details and carving or plain work of more rugged character.

MILFORD NEW HAMPSHIRE

Quarry at **Milford, N. H.** Quarried by:
Kittredge Quarries, Milford, N. H.

A quartz-monzonite granite of light gray shade with a very slight bluish tinge, spangled with black mica. The Kittredge quarry produces a fine, inclining to medium grained granite for building work and a very fine grained granite for monumental uses. The chief characteristics of the finer grained granite are its uniformity and delicacy of tint and its adaptability for fine details and carving. Its free working qualities well adapt it for general building purposes and also for curbing and paving.

CAROLINA GRAY

Quarry at **Salisbury, N. C.** Quarried and Cut by:
The Harris Granite Quarries Co., Salisbury, N. C.

A light gray biotite granite of medium grain. Sparsely scattered flecks of pink give the surface a unique character especially when polished. These small pink spottings are not close enough together to modify the light gray color, but give life and warmth to the stone and emphasize its whiteness. It takes a good polish, dresses well under the hammer and is well suited to building uses.

SWENSON GRAY

Quarry at **Concord, N. H.** Quarried and Cut by:
The John Swenson Granite Co., Concord, N. H.

A muscovite-biotite granite of light to medium bluish gray color and fine to medium, somewhat porphyritic texture. Polishing deepens the tone and brings out the bluish cast, while hammering lightens the color appreciably, there being considerable contrast between the rough and hammered faces and strong contrast between hammered and polished. The fast working qualities of this Concord granite contribute materially to economical cutting, and it is used extensively for both building and monumental work.

MOUNT WALDO

Quarry at **Frankfort, Me.** Quarried and Cut by:
Grenci & Ellis, Inc., Peekskill, N. Y.

A biotite granite of light to medium gray shade and with medium inclining to fine, even grained texture. The whiteness of the feldspars is lightly shaded by the gray smoky quartz. Small but well defined biotite crystals distributed quite uniformly but coarsely over the surface give life and character to the granite and emphasize the whiteness of the feldspars. It works freely under the hammer and is well adapted to general building uses.

WOODBURY GRAY

Quarry at **Woodbury, Vt.** Quarried and Cut by:
Woodbury Granite Co., Inc., Burlington, Vt.

A medium gray biotite granite with somewhat bluish cast and medium texture. Its mineral contrasts are quite marked, especially on the polished face. It is adaptable for both building and monumental uses, the monumental grade having a fine inclining to medium texture and somewhat less marked mineral contrasts. Woodbury Gray works well under the hammer and is well adapted for both plain and carved work.

BARRE BUILDING

Quarry at **Barre, Vt.** Cut by:
Cook, Watkins & Patch, Inc., Barre, Vt.

A biotite granite of light medium, slightly bluish gray color and fine to medium grain. It is somewhat coarser and less even grained than the "Light Barre" granite produced by the same quarry for monumental purposes, but is otherwise identical and of equal physical quality with the monumental grade. Its good weathering and easy working qualities well adapt this granite for all building purposes.

CONNECTICUT WHITE

Quarry at **Waterford, Conn.** Quarried and Cut by:
Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York, N. Y.

A quartz-monzonite granite of medium buff-gray color and even, fine grained texture. It hammers very light and its even tone and very fine grain adapt it to fine architectural and sculptural work. It is also a very fine-graded monumental and inscriptional granite. It takes a high polish which gives a buff-tinted medium to dark gray shade without mineral contrasts.

LIGHT MOHEGAN

Quarry at **Peekskill, N. Y.** Quarried and Cut by:
Grenci & Ellis, Inc., Peekskill, N. Y.

A muscovite-biotite granite of light grayish-buff color and medium grain. The mica in Mohegan granite is not abundant and has very little influence upon the shade or texture of the stone. The general whiteness of the feldspars is softened by a delicate tint of buff giving it the mellowed look of old ivory. It works well under the hammer and is well adapted to carving.

DARK MOHEGAN

Quarry at **Peekskill, N. Y.** Quarried and Cut by:
Grenci & Ellis, Inc., Peekskill, N. Y.

Dark Mohegan is identical with Light Mohegan except that its general color is a deep, yellowish-buff, which appears to be a primary color and permeates the entire stone. The deeply tinted yellow crystals give a decidedly golden cast to the polished face, and in hammered finish the surface has the soft deep buff color which is the chief characteristic of Mohegan granite.

SWENSON BUFF ANTIQUE

Quarry at **Concord, N. H.** Quarried and Cut by:
The John Swenson Granite Co., Concord, N. H.

A muscovite-biotite granite of light to medium grayish buff color and fine to medium grain. It is available in variegated buff tints produced by the delicate blending of brown and gray in the mica and feldspar. It has a softness of tone and pleasing antique character which give unique charm to the work in which it has been used. Buff Antique is effective in hammered or polished finish and is especially attractive as split face ashlar with hammered trim.

GOSS PINK DEER ISLE

Quarry at **Crotch Island, Stonington, Me.** Quarried by:
John L. Goss Corporation, 77 Summer Street, Boston, Mass.
Cut by the following Association members:
Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York, N. Y.
Cook, Watkins & Patch, Inc., Barre, Vt.
Grenci & Ellis, Inc., Peekskill, N. Y.
Providence Granite Co., Providence, R. I.
The John Swenson Granite Co., Concord, N. H.
Alexander Thomson, Inc., Providence, R. I.
Woodbury Granite Co., Inc., Burlington, Vt.
A. Le Poidevin & Co., Inc., 286 Fifth Ave., New York, N. Y.

A biotite granite of pinkish lavender-tinted medium gray color and coarse, even-grained texture. The mineral contrasts, softly blended on the hammered face, produce a very attractive pattern when polished, the predominating lavender colored feldspar rimmed and intergrown with milk-white feldspar, in a background of smoky quartz accented with small, sparsely scattered crystals of biotite. It works well under the hammer and takes an excellent polish.

OLD PINK MILFORD

Quarry at **Milford, Mass.** Quarried by:
L. Luchini & Son, Milford, Mass.

A biotite granite of light to medium pinkish-gray color accentuated with sparsely scattered black spots. Its texture is medium to coarse, somewhat gneissoid but more even grained than the old adjoining Norcross quarry. A finer grained variety is also quarried in which the black spots are smaller and more closely distributed, giving a finer texture with about the same pinkish color and shade as the coarser grained stone.

SWENSON PINK

Quarry at **Wells, Me.** Quarried and Cut by:
The John Swenson Granite Co., Concord N. H.

A light pink biotite granite with medium to coarse texture. Occasional waves of closely segregated black and stripes of pink give a unique and attractive variation in texture. The more uniform areas have a background of creamy and pinkish feldspars, flecked with reddish pink plagioclase, mottled with smoky quartz and accented with occasional crystals of sparkling biotite. It hammers well and takes a high polish.

CONWAY PINK

Quarry at **Redstone, N. H.** Quarried and Cut by:
Maine & New Hampshire Granite Corp'n, North Jay, Me.

A biotite granite of light pinkish-gray color uniformly mottled with large dark-gray and small black spots, and having a coarse, even-grained texture. The mineral contrast is mostly between the pink feldspar and the smoky amethystine quartz, which, especially in polished finish, is quite marked and very pleasing. Minor spots of black mica give added character and interest. This granite works freely under the hammer and takes a brilliant polish.

SOMES SOUND

Quarry at **Mt. Desert, Me.** Quarried and Cut by:
Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York, N. Y.

A biotite granite of light pinkish-buff color with a medium, inclining to coarse, even-grained texture. The mineral contrasts are soft and pleasing, with a background of pinkish-buff feldspar, rimmed and intergrown with milk-white feldspar and delicately mottled with medium tinted smoky quartz, lightly accented with small crystals of black mica. It takes a fine polish and works well under the hammer.

CAROLINA PINK

Quarry near **Granite Quarry, N. C.** Cut by:
The Harris Granite Quarries Co., Salisbury, N. C.

A biotite granite of light mottled pink color and medium, inclined to coarse, even-grained texture. Its mineral contrasts are more pronounced than in the Balfour Pink and the predominating pink feldspar has a slightly buff cast as compared with the purplish tint in the Balfour. It takes a good polish, hammers well and works more freely than the Balfour both under the hammer and the machine.

BALFOUR PINK

Quarry at **Granite Quarry, N. C.** Quarried and Cut by:
The Harris Granite Quarries Co., Salisbury, N. C.

A biotite granite of uniform, slightly purplish-pink color and medium grain. The mineral contrasts are scarcely apparent and the grain only vaguely defined, due to the uniform color and even distribution of the pink feldspars and the small amount of biotite. It is extremely hard but takes a beautiful finish either under the hammer or polishing machine. Its uniformity of color and texture and susceptibility to high polish adapt Balfour Pink to both building and monumental uses.

JONESBORO RED

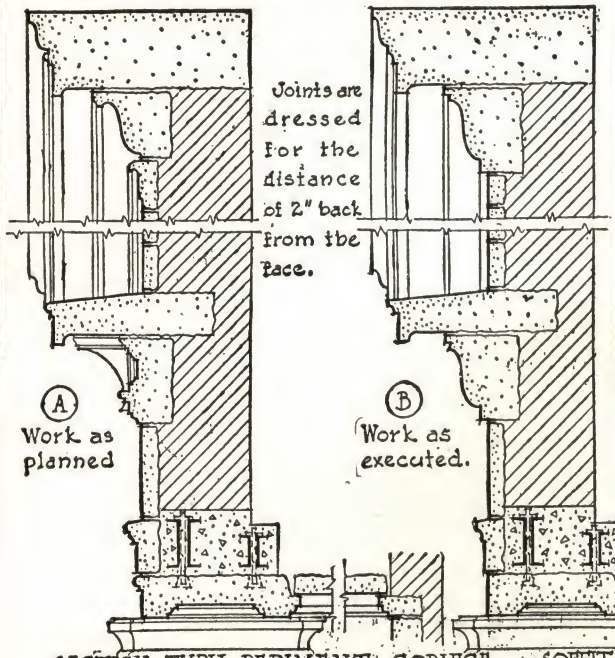
Quarry at **Jonesboro, Me.** Quarried and Cut by:
Booth Bros. & Hurricane Isle Granite Co., 208 Broadway, New York, N. Y.

A biotite granite of medium reddish-pinkish-gray color and of coarse, inclining to medium, even-grained texture. The mineral contrasts are strong and effective. The reddish-pink of the predominating feldspar is emphasized by the less abundant cream-colored feldspar and the even mottling of smoky quartz. It takes a fine polish, the durability of which is favored by the smallness of the sparsely scattered biotite scales.

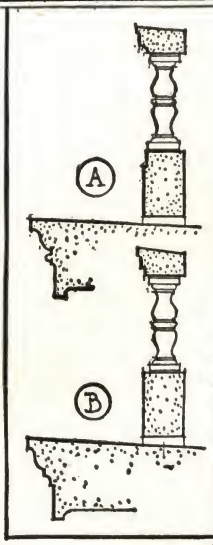
CONWAY GREEN

Quarry at **Redstone, N. H.** Quarried and Cut by:
Maine & New Hampshire Granite Corp'n, North Jay, Me.

A biotite-hornblende granite of dark olive green color with black spottings and with coarse, even-grained texture. The predominating feldspar is medium gray with more or less yellow-green on its cleavage faces. The feldspar is surrounded with smoky quartz of dark yellowish or olive-green color accented by sparsely distributed black spots of biotite and hornblende. It takes a high polish and its color is striking both in the rough and polished.



SECTION THRU PEDIMENT, CORNICE, & SOFFIT OF COLONNADE
Scale – ¼" = 1'-0"



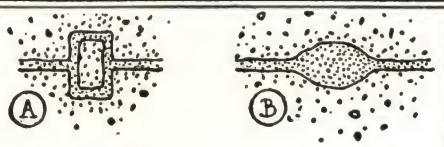
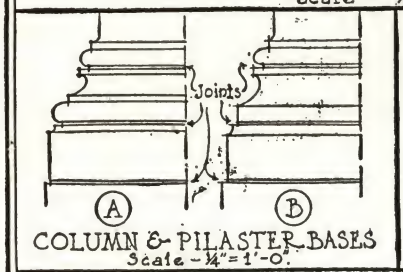
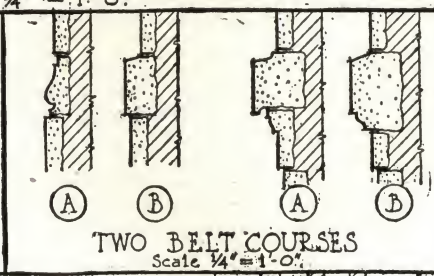


Diagram "A" shows stone (or brass) dowels, an expensive method of anchoring balusters. Diagram "B" shows an inexpensive but practical method of anchoring with cement, with just as satisfactory results.

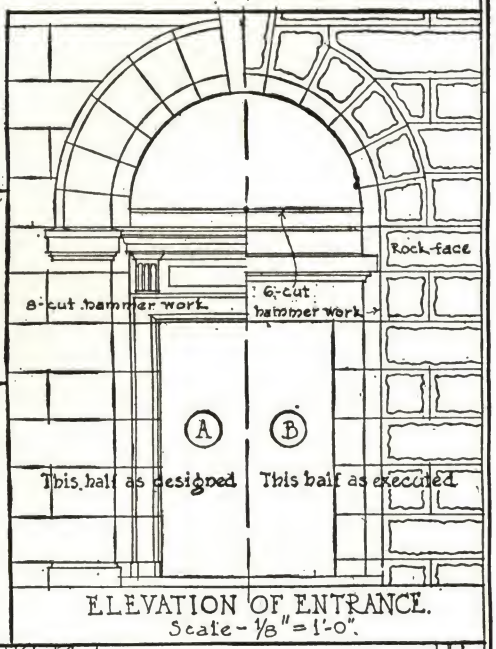
BALUSTRADES



COLUMN & PILASTER BASES
Scale – ¼" = 1'-0"



TWO BELT COURSES
Scale ¼" = 1'-0"



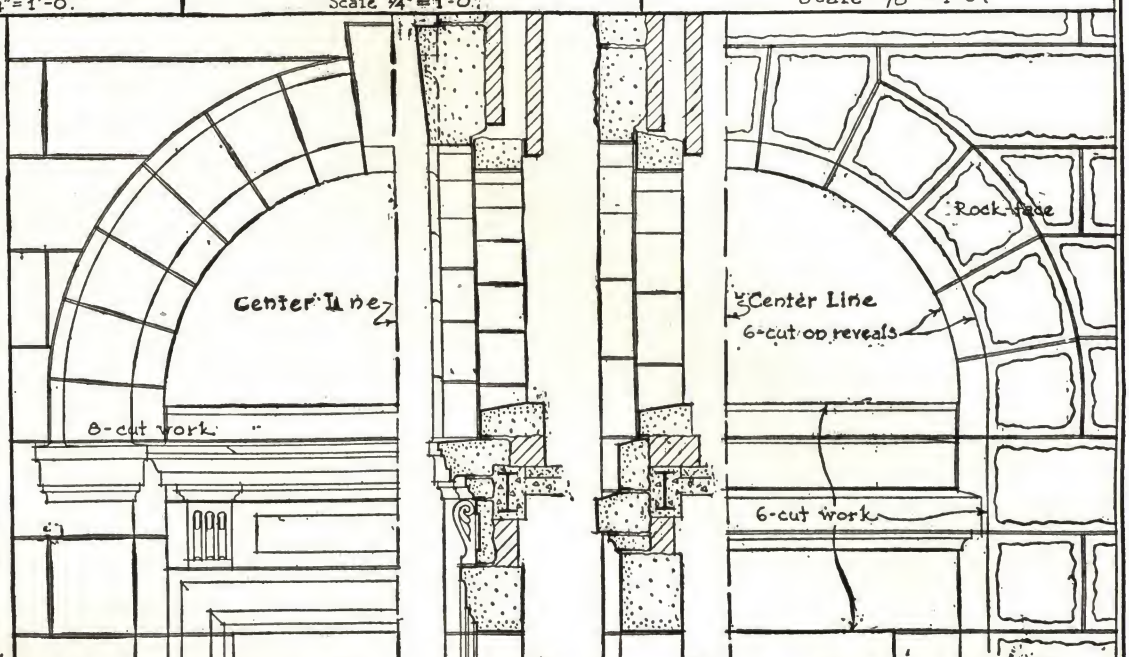
ELEVATION OF ENTRANCE.
Scale – ⅛" = 1'-0"

NOTES

This sheet shows changes made in the details of an actual building in which the mouldings were simplified, & the surfaces below the 1st fl. level were changed to rock-face & hammered trim, with a saving of $75,000 on the granite work.

Details "A" show mouldings as originally designed.

Details "B" show the executed work.



ONE-HALF ELEVATION (A) SECTION (A) SECTION (B) ONE-HALF ELEVATION (B)
¼" SCALE DRAWINGS OF ARCH AT ENTRANCE.

DRAWN BY SWEET'S CATALOGUE SERVICE INC.	COMPARATIVE DETAILS SHOWING ECONOMICAL DESIGN FOR GRANITE WORK.	SCALE ⅛" & ¼" EQUAL 1'-0" DATE JUNE '20 DRWG 2

PRACTICAL NOTES ON GRANITE SPECIFICATION AND DESIGN

Granite Versus Less Durable Material

Architects frequently claim that cost considerations compel the use of softer stones or material admittedly less durable and appropriate than granite.

Before ruling out a superior material like granite because of supposedly prohibitive cost, the greatest latitude should be permitted in stock, finish, jointing and details. Unsightly discoloration, weathering away or disintegration will soon neutralize or eventually efface any extra aesthetic effects which the substitution of a cheaper, less durable material may temporarily provide. The crudest of granite work retains its superior qualities indefinitely, and good granite work remains a joy forever.

The cost of granite need not ordinarily be prohibitive if certain fundamental facts are taken into consideration by the specification writer and designer.

In Regard to Specifying Color and Finish

Cost will be reduced if reasonable variations in color and texture, characteristic of most quarries, are permitted, eliminating only too obvious defects such as unsightly knots or clearly defined stripes.

Kind and quality of finish should be gauged by its effect in the building rather than at close range. The finer cuts are often specified where coarser finish would be more suitable and less expensive. Rock face and pointed work may often be used in place of hammered work, at less cost and with good effect. For plain surfaces, especially for work not near the eye, sawed finish or sawed and sand blasted is often more suitable and always economical.

Beds and Joints Deserve Attention

A surprising percentage of the cost of granite work is in the cutting of beds and joints. Elimination of unnecessary requirements here will produce material savings. Bush-hammered edges and unnecessary fullness of beds and joints add needless expense.

To require the same quality of arris and bed on coarse finishes as on fine hammered work is an expensive fallacy. It is sound trade custom to make beds conform to surface finish. Fullness of bed is a structural matter and it is sufficient in granite to provide reasonably full bearings near each vertical joint.

We recommend ¼ inch as the minimum allowance for beds and joints on monumental building work. On coarser textured work ⅜-inch or ½-inch joints are adequate and effective. For rock-face and more massive masonry even larger joint allowances are recommended.

Mouldings and Ornament

Hand cutting is required on practically all moulded work and ornament. The cost of hand labor is the most expensive item in granite cutting. Elimination of unnecessary members and simplification of details will reduce cost materially. Study of Plates "A" and "B," pages 6 and 7 will be of real help to the designer in working out his moulded details for economical production.

Special attention is also called to description of the sand blast process on page 12 and to carborundum sawing on page 18.

The use of the sand plast process and carbo-saw cuts for ornament opens up new and interesting possibilities for designers in granite.

Granite Carving and Models

Granite can be carved with the same delicacy of treatment and detail as much softer and less durable stones. The pneumatic carving tool, in the hands of a skilled granite carver, has made it possible and practical to carve granite to almost any extent desired, the only limiting factor being that of cost.

In the preparation of details and models for granite carving, three points should be considered: the color and texture of the granite; location in the building as to distance from the eye; and location as to sunlight.

Delicate detail would generally be wasted on a coarse grained granite having strongly contrasting mineral constituents. In a fine grained, light colored granite, or a granite of light uniform tone regardless of grain, delicate details would appear more nearly in their true values.

The character of detail and treatment, both from the aesthetic and economic viewpoints, should be regulated by the location of the carving in the building both as to distance from the eye and as to light and shade effects in different exposures.

A Few Cost Saving Pointers

The cost of granite work may be materially reduced by a study of the countless minor details from the viewpoint of economical production. A few pointers are given below as typical examples, and a study of the various granite plates illustrated in this catalogue will suggest others.

Color and Texture—Permit reasonable variations in color and grain, characteristic of the quarry from which the granite is taken.

Finish—Judge the quality of finish by its appearance in the building and specify the coarsest finish which will give the desired effect. For plain work utilize where possible the surface as it comes from the saw, lightly steeled or sand blasted to avoid possibility of rust stain.

Beds and Joints—Arrises and bed edges should conform to quality of face finish. Do not require ten-cut edges on four-cut work. Reasonably full bearings near each vertical joint are sufficient for stability. Full beds entire length of stone involve needless expense.

Jointing to Save Stock and Hand Cutting—Internal angles, cut in the solid should be avoided by jointing up. Joint heads to avoid expensive back checking for steel or backing. Cornices and similar courses can often be jointed to permit sawing or machining of flat surfaces, and to save stock.

Projections—Avoid projections on courses which might otherwise be sawed or machine surfaced.

Steps and Platforms—For safety and economy four-cut or machine point treads. Sawed treads and split risers are effective and practical for inexpensive steps. Avoid unnecessary bedding to exact height by allowing at least 2 inches between top of concrete and bottom of stone on plans.

Simplification of Mouldings—Simplify as much as possible by eliminating unnecessary members and unimportant details. (See Plates "A" and "B," pages 6 and 7.)

Avoid Raised Seats and Lugs—Raised seats and lugs on balustrade base, platforms, sills and thresholds are expensive. Keep to flat surfaces where possible, using depressed lugs if necessary.

Area Coping—Four-cut or machine pointed top and split face is economical and usually adequate. Omit rabbets for grilles, substituting iron brackets. Eliminate lock joints and substitute dowels.

Balusters—Substitute round for square plinths on turned balusters. Bed to slope of base to avoid raised seats.

Rustications, Rabbets, Checks and Drips—Detail to be carbo-sawed rather than for hand cutting.

Eliminate Guesswork in Estimating—Make plans, details and specifications as complete and clear as possible and ensure closer and more intelligent estimates.

Detail for Granite—Detailing for stone, regardless of whether it is to be of granite, marble or limestone, is responsible for much of the extra cost of granite. Best results will be secured if details are made specifically for granite. The Association can render real service here if consulted while details and specifications are under way.

THE ECONOMICAL SAND BLAST PROCESS AND ITS POSSIBILITIES FOR APPLICATION TO GRANITE CARVING AND SURFACE TREATMENT

The Sand Blast Process Described

This process has well been termed a "harnessing of the sand storm," for the sand blast is controlled at will to the etching of unique and beautiful ornaments. The cutting medium is white silica sand, or similar abrasive, driven through a controlled nozzle at very high velocity by compressed air, under absolute control of the operator.

The face of the stone to be "blown" is covered by a rubberlike composition about ⅛ in. thick, termed "dope" or "glue" in the trade. This "dope" is then cut away from the parts to be etched, forming, in effect, a stencil of the outline or ornament.

The sand blast etches away the granite thus exposed to the depth required in a remarkably short time. After the stenciled design is "blown," the blanket of "dope" is removed from the stone, revealing a remarkably clean cut intaglio possessing a unique texture and beauty impossible to duplicate by any other means.

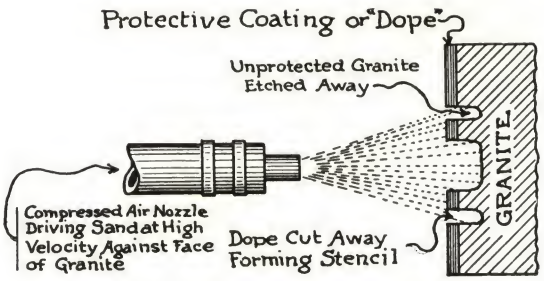


Diagram Showing Principle of Sand Blasting Process

Surfaces may also be etched in a similar manner to a moderate depth to produce sinkages and unique texture effects having almost limitless possibilities.

This, in brief, is the process. There are many variations in technique, and combinations of blowing, re-doping and re-blowing, by means of which a skillful operator may produce effects in shading, variable depths and texture which have unrealized possibilities of application and development.

Simple Forms of Application

The sketches below illustrate a few typical forms of application, from which the basic principles of sand blast ornament, as developed in the memorial granite industry, may be visualized. Applications of these simple principles to architectural ornament may be developed to any extent desired.

While the sinkage produced by the etching is relatively slight as compared to regulation carving, the sharpness of its cuts and the unique tone and texture of its surfaces in contrast with hammered or polished surfaces, produce effects which cannot be duplicated by any other method.

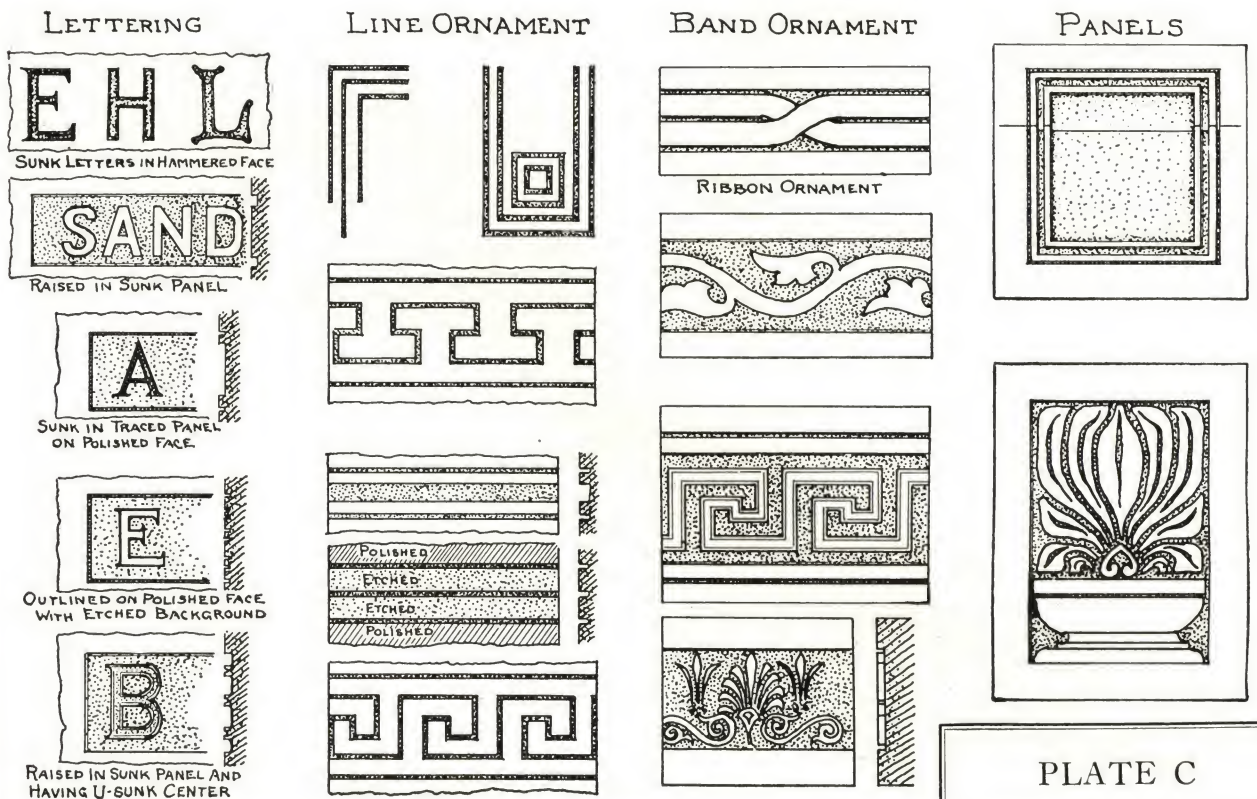


PLATE C

INFORMATION AS TO VARIOUS GRANITE FINISHES

Description of Regular Surface Finishes, Arranged in Order of Relative Cost

The surface finishes best adapted and most frequently used for granite on building work are:

Rock Face, Sawed, Pean-hammered, Pointed, Sawed and Sand-blasted, Four-cut, Six-cut, Eight-cut, Rubbed, Honed and Polished.

These terms are frequently misunderstood and sometimes misapplied, so the following brief descriptions are given as a matter of information.

Rock Face—Generally the least expensive finish, but with decorative as well as utilitarian value. The relative cost varies with the grade of work required.

The grades vary from ordinary split or quarry face ashlar with split or roughly squared beds and joints, to carefully quarried faces having practically uniform projection, and with joints and arrises as carefully and accurately cut as for hammered work, and sometimes with rusticated or tooled margins.

Sawed Finish—A comparatively inexpensive plain-surface finish, utilizing the surface just as it comes from the saw, without further dressing or bushing. The marks or grooves left by the gang-saw, while not regular or uniform are generally parallel and give a texture effect approximately equivalent to four or six-cut work at a reasonable distance from the eye. This finish is not recommended unless special precautions are taken both during and after sawing to avoid rust stains developing after setting and exposure to the weather.

Pean-hammered—Adapted to rougher work, such as steps, curbings, house or mill sills and thresholds, or to portions of high class work not exposed to the eye. Pean-hammering is coarser and less regular than four-cut and point marks are not entirely eradicated by axing.

Pointed Work—Coarse, medium, fine and machine pointed are the four general distinctions for pointed work, with many special types for certain texture effects.

Hand pointing and machine pointing differ slightly in general appearance, machine pointing being generally more uniform. Special pointing is generally more expensive than the standard grades. In general, the point depressions in fine pointing will be approximately 3/8 in. apart, medium and machine pointing 5/8 to 3/4 in., and coarse pointing 1 to 1 1/4 in.

Where special pointing is required, a sample should first be prepared under the architect's supervision. Beds, joints, and arrises will conform to the character of use and grade of pointing.

Sawed and Sand Blasted—This finish utilizes the surface just as it comes from the saw which is then lightly sand blasted, sufficiently to remove particles of steel ground into the surface during sawing and if desired to partially remove the more obvious saw marks and give a more uniform texture effect to the surface.

Four-cut, Six-cut, and Eight-cut—These finishes are produced by bushing with the patent "bush-hammer." This is a hand-hammer with patent head having two opposite jawlike openings about 7/8 in. wide, into which are firmly bolted sets of four, six or eight cutting blades as the case may be.

Four-cut work is frequently and erroneously specified as four cuts to the inch. Actually the four-cut hammer leaves nearer five cut marks to the inch, as four cutting blades are clamped into a 7/8-in. jaw; six-cut and eight-cut are likewise incorrectly specified as six cuts to the inch or eight cuts to the inch.

In bush-hammered finish the resultant surface has the appearance of being uniformly corrugated to the fineness determined by the number of cuts used, but while the bushing is kept parallel and in the required direction the bush marks are not necessarily continuous or mechanically precise.

Six-cut and eight-cut finishes are simply continuations of the four-cut process, each finer hammer being used consecutively until the required finish is reached.

Pneumatic surfacing machines are also used for bushing, especially on all larger surfaces, following practically the same routine as required for hand bushing. Sawed surfaces are also bushed under the surfacing machines, in which case much of the preliminary preparation is avoided.

Ten-cut and Twelve-cut—These finishes are also produced, but less frequently used on regular building work, being more applicable to small memorials or special work. Texture and character are emphasized by the coarser finishes.

Rubbed and Honed—Produced by grinding a pointed or sawed surface under the polishing wheel. The grade of rubbing is determined by the extent to which this grinding is carried and the abrasive used; from coarse-rubbed, with small surface scratches, adapted to work requiring fine smooth finish but not close to the eye, to honed finish, which is the last stage just before glossing, with velvet smooth surface, practically free from scratches.

Polished Finish—Produced by glossing, under a heavy, felt coated wheel, a surface previously rubbed and honed. A durable and mirrorlike polish requires that the grinding and glossing processes be carried to their extreme stages, leaving a surface free from scratches, dull spots, or "stun marks" from the tooling.

Under modern methods practically every standard granite may be polished to a satisfactory gloss, suitable and durable for most ordinary requirements. Generally the harder granites and those containing the least mica content take the best and most durable polish.

Hand Polishing—Small surfaces and mouldings generally have to be rubbed, honed or polished by hand at considerable extra expense over machine work or cut work of similar character. On work where cost is the dominant factor portions necessitating hand rubbing or polishing should be avoided wherever possible.

Selecting the Finish

The following general suggestions will indicate methods of selection, which depend on the type and design of building, and color and texture of the granite:

Large scale work: rock-face, pointed and the coarser cuts. Small scale work: the finer cuts.

Rock-face, sawed, pean-hammered, pointed and four-cut for economy, and rock-face and pointed for decorative effect in conjunction with hammered work and other materials.

Six-cut or sawed and sand blasted for average work, combining economy with good architectural effect.

Polished for base courses, portions subject to traffic stain, lower stories where exposed to smoky atmosphere, and for decorative effect.

Rubbed or honed where fine finish is required and for softened tone and texture effects.

Polished finish is practically impervious to stain or weather. Fine finishes will keep clean longer than coarser finishes, particularly where subject to atmospheric dirt and dust.

The possibilities of combining different grades of finish are almost unlimited, and combinations of different granites are used extensively with splendid architectural results.

STANDARD GRADES OF FINISHES FOR EXTERIOR BUILDING GRANITE WORK

Full-sized Reproductions Prepared from a Standard Light to Medium Granite of Fine to Medium Grain

Plate No. 1. Rock Face

Plate No. 4. Medium Pointed

Plate No. 2. Pean-hammered

Plate No. 5. Fine Pointed

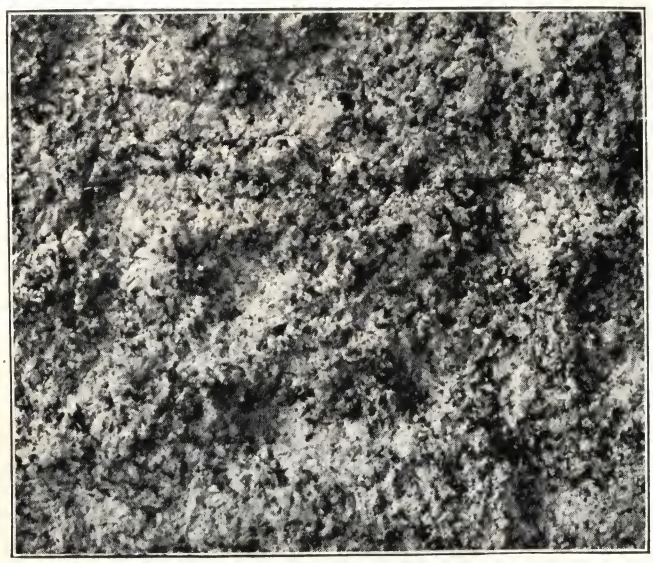


Plate No. 3. Coarse Pointed

Plate No. 6. Four-cut

STANDARD GRADES OF FINISHES FOR EXTERIOR BUILDING GRANITE WORK

Full-sized Reproductions Prepared from a Standard Light to Medium Granite of Fine to Medium Grain

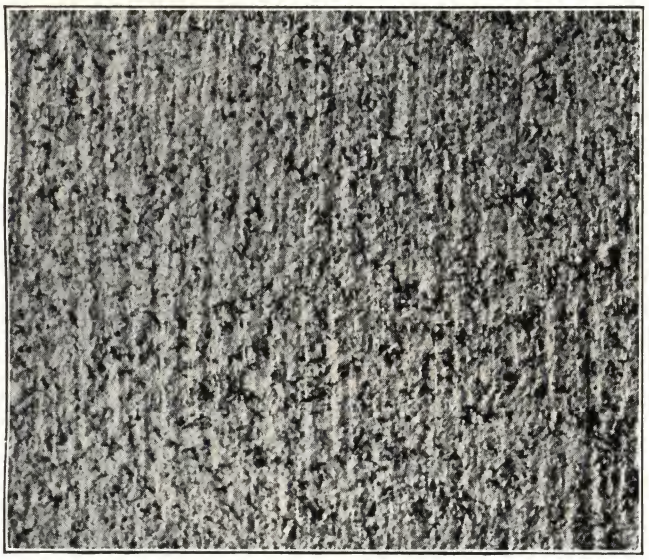


Plate No. 7. Six-cut

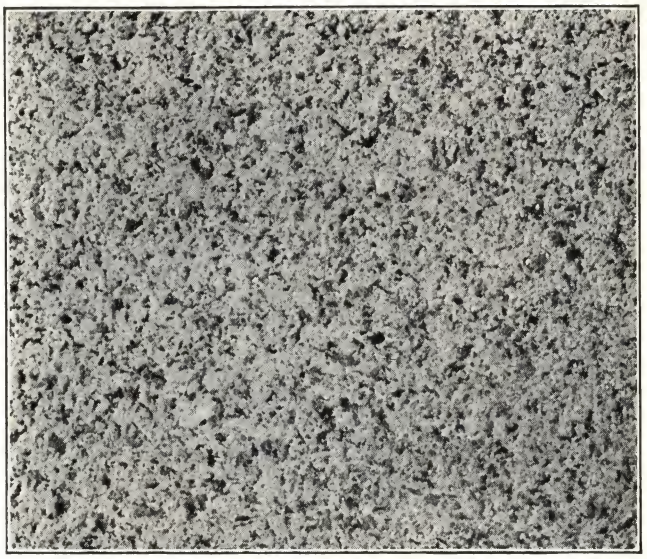


Plate No. 10. Rubbed

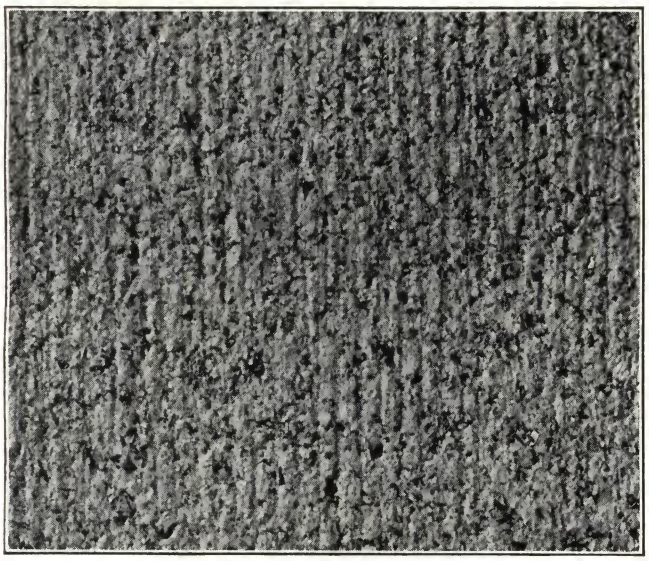


Plate No. 8. Eight-cut

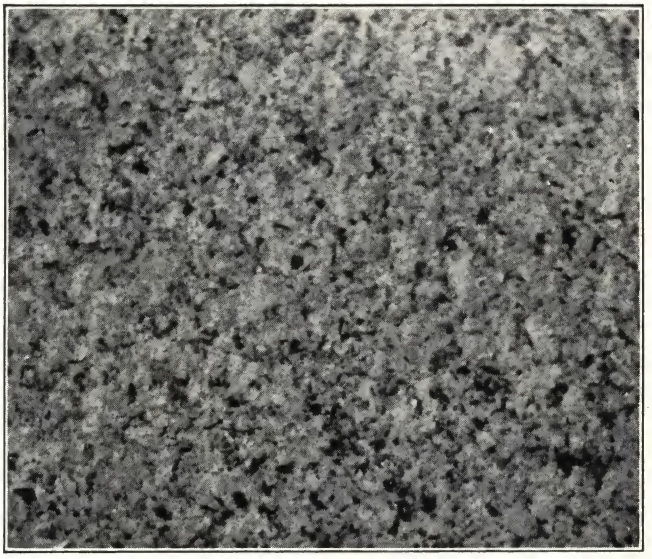


Plate No. 11. Honed

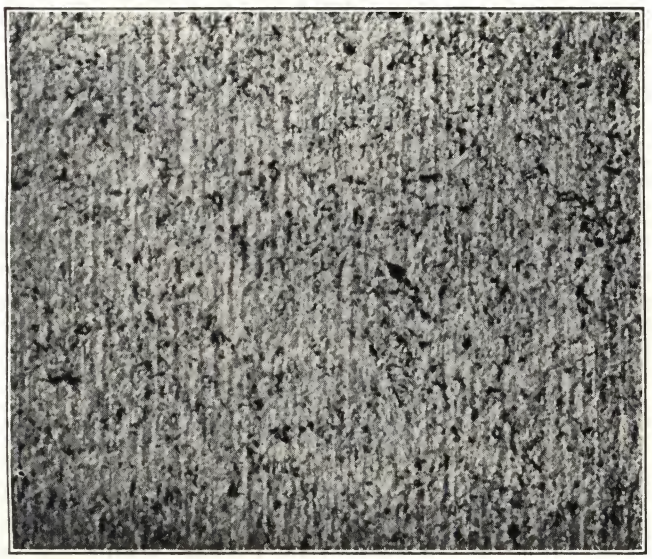


Plate No. 9. Ten-cut

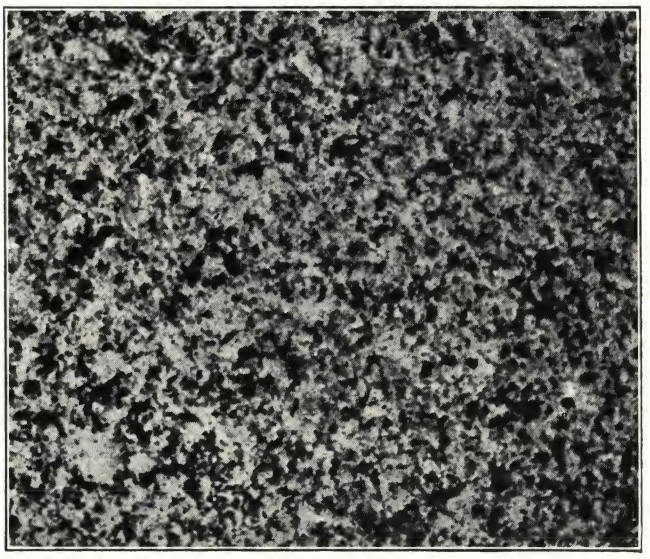
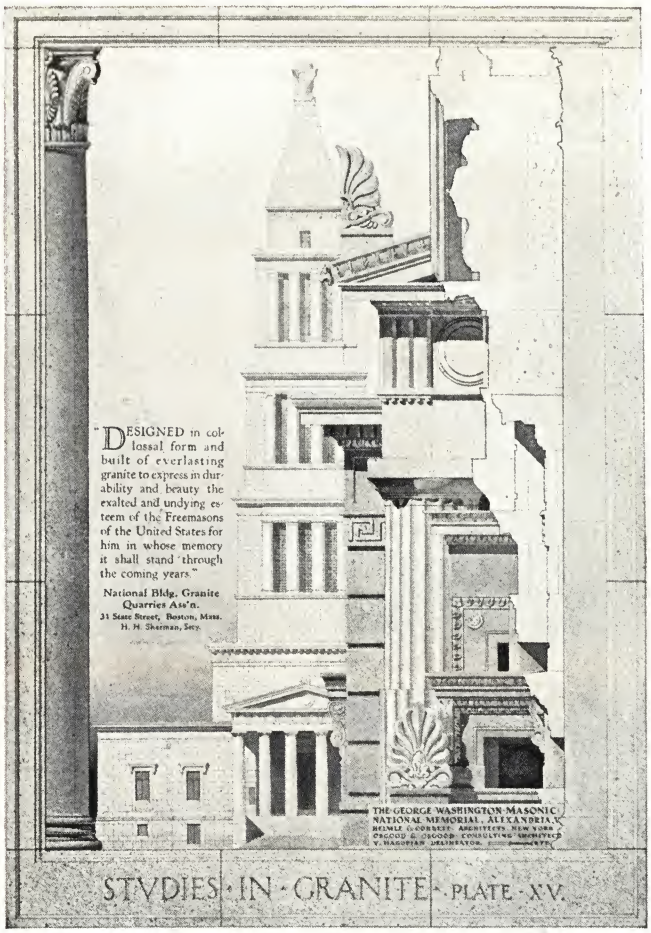
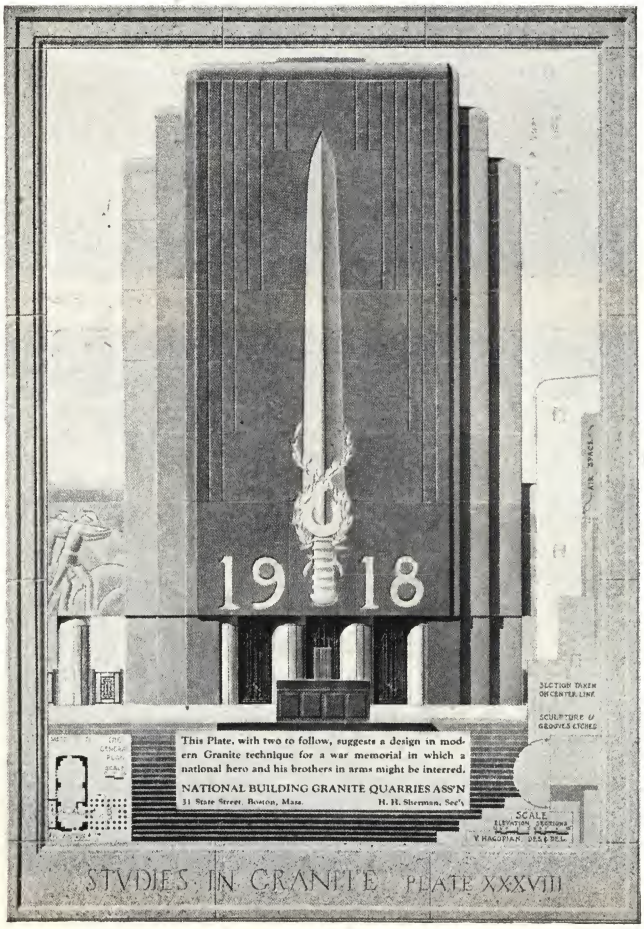


Plate No. 12. Polished



Example of First Phase of Series

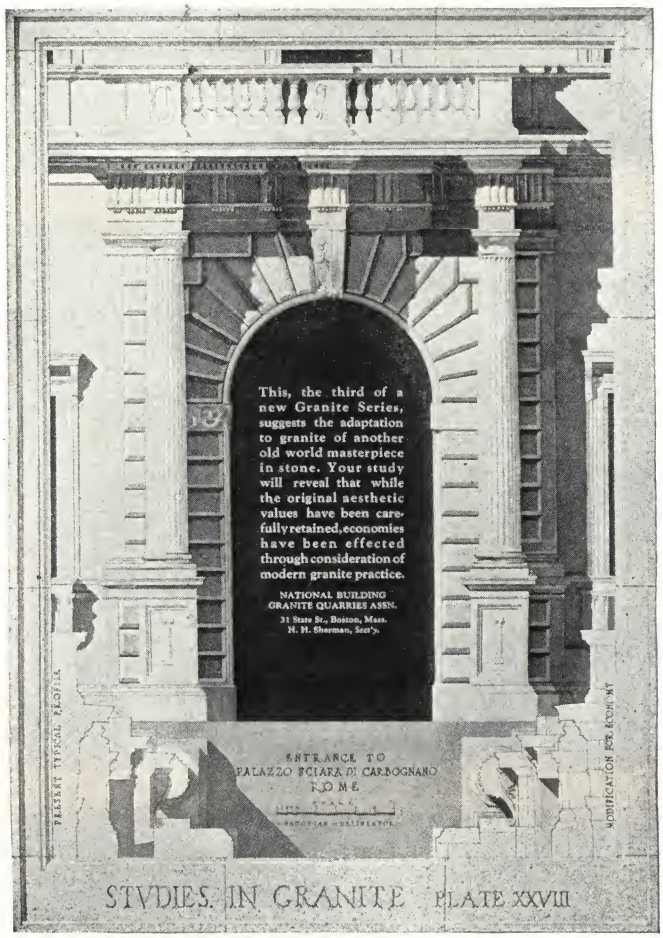


Third Phase—Original Design in Modern Manner

STUDIES IN GRANITE

The Association has been developing an interesting series of carefully rendered plates entitled "Studies in Granite." These plates illustrate the architectural use of granite and have been prepared for the information and use of designers, draftsmen and architectural students. This series has grown to a present total of forty-three plates, divided into three phases or groups. They have attracted world wide attention and splendid comment from the profession for their excellence in composition, rendering and practical value.

This entire series has been rendered by Vahan Hagopian, and each plate has been the subject of careful study, both from the aesthetic and practical viewpoint. They are of sufficient excellence and practical value, we believe, to make them a valuable addition to any architect's or student's library.



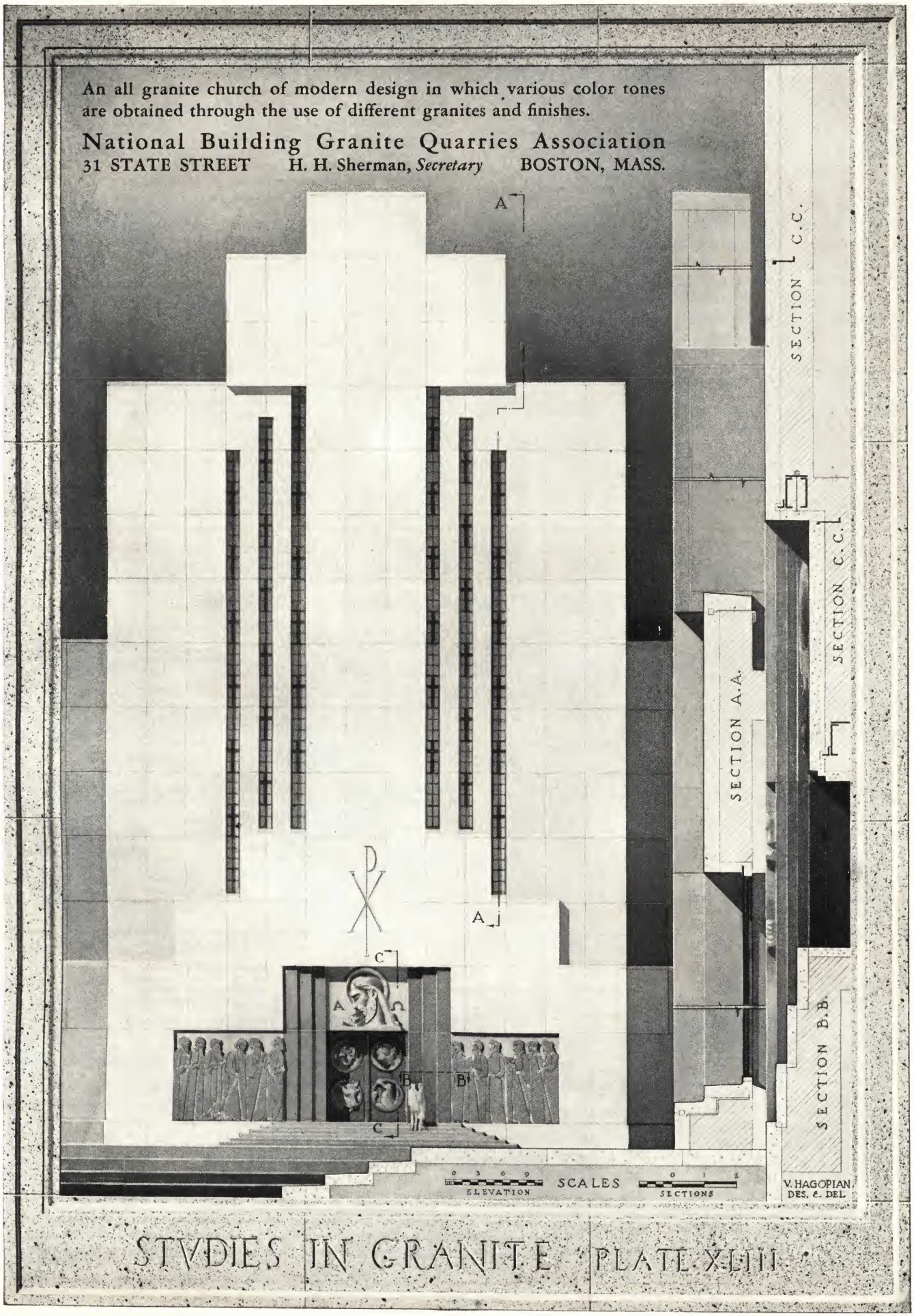
Second Phase—Old World Studies

The first group of twenty-five plates illustrates granite projects designed by contemporary American architects. Plate XV, illustrated at reduced size on this page, is typical of this group.

The second group, Plates XXVI to XXXIV inclusive, is based on studies of old world masterpieces in stone. Original details are compared with suggestive modifications to illustrate the possibilities of simplification without serious detriment to aesthetic values.

The phase, of which Plate XXXVIII is typical, consists of original designs illustrating the exceptional adaptability of granite to the modern trend in design and construction. This group starts with Plate XXXV and is still being added to.

The complete set of plates in any or all the groups will be sent upon request to any architect, designer, draftsman or architectural student.


An all granite church of modern design in which various color tones are obtained through the use of different granites and finishes.
National Building Granite Quarries Association
31 STATE STREET H. H. Sherman, Secretary BOSTON, MASS.
A
A
C
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B'
SECTION C.C.
SECTION C.C.
SECTION A.A.
SECTION B.B.
SCALES
ELEVATION
SECTIONS
V. HAGOPIAN DES. & DEL.
STVDIES IN GRANITE PLATE XLIII

MODERN GRANITE VENEER

In buildings of the more modern type, where the exterior facing serves as a decorative and protective veneer rather than as a structural element, the use of granite is developing to such an extent and production methods are being so revolutionized that special consideration must be given to detailing and specifications for this type of work.

Its inherent beauty and variety of color and texture, its ability to take a high and durable polish, and its imperviousness to moisture and resistance to weathering even in the thinnest of slabs, give granite exceptional qualifications for use as exterior veneer. The extensive development and use of saws and carborundum machines in the granite industry have made the furnishing of granite veneer both feasible and economical.

The term "granite veneer" is applied to finished facing less than 4 in. in thickness. Granite veneer can be produced down to 1 in. in thickness, but for practical purposes 2 in. is recommended as the minimum thickness for exterior work.

Specifications describing hand finished work are not applicable in many respects to this type of work, and a few useful pointers are given below as a guide to the specification writer and designer.

Specification Pointers

Surface Finish—The finishes best adapted for granite veneer include polished, honed, rubbed (fine to coarse), and sawed and sand-blasted. Bush-hammered or pointed finishes are not recommended for work under 4 in. in thickness.

Projecting Edges—On polished, honed and rubbed veneer, projecting edges not exceeding ¾ in. wide may be left without further finish if carbo-sawed.

Beds and Joints—Beds and joints shall be full and square at least two-thirds back from face, reasonably free from depressions and may fall off not to exceed ½ in. at back.

Width of Joints—Joints shall be uniformly ¼ in. in width. (When desired to make jointing less conspicuous in polished or honed veneer, $\frac{3}{16}$-in. or ⅛-in. joints may be specified.)

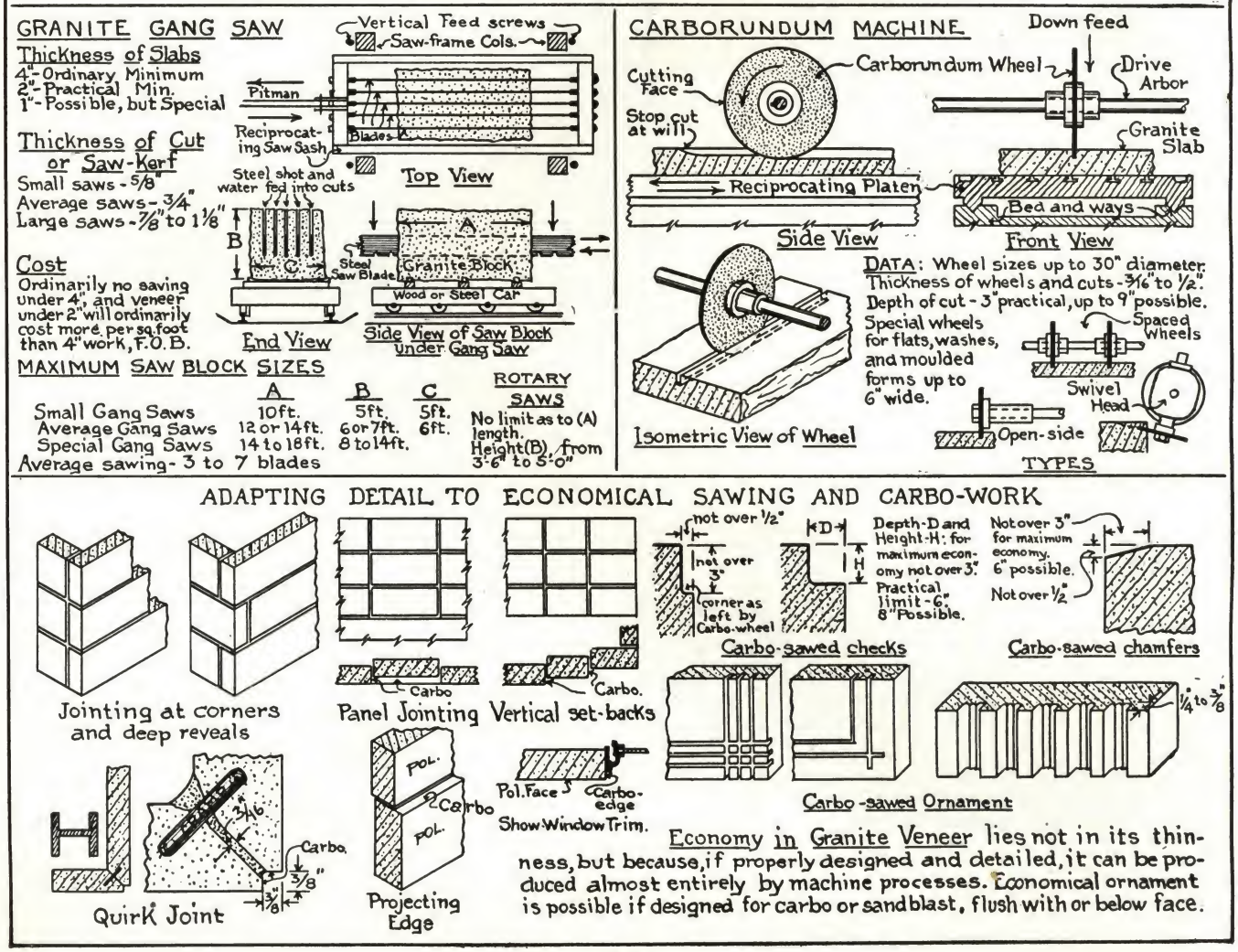
Quirk Joints—To avoid expensive back-checking for wide heads or reveals, quirk joints are recommended. The exposed edge of joint may be carbo-sawed. Joint surface should be full for at least 1½ in. and may fall off not to exceed ½ in. at the back.

Bonding—Where the veneer is not counted in computing wall thickness under building code requirements, no bonding is necessary either in the wall or by breaking joints.

Setting—Granite veneer should be set in non-staining mortar and backs of all mortar joints should be suitably dampproofed or parged to prevent moisture from seeping through the joint from the backing.

Anchoring—Anchor to backing or steel with ⅜-in. round iron, galvanized after bending, turned down ¾ in. into the stone (where veneer is 2 in. or less in thickness), using two anchors in top bed of each stone. (For 3-in. veneer turn down 1 in. and 1¼ in. for 4-in. veneer.)

ILLUSTRATING THE BASIC PRINCIPLES AND ECONOMICAL USE OF GRANITE SAWING AND CARBORUNDUM MACHINE WORK



RUBBLE ASHLAR

The Use of Granite as Rubble Ashlar

The demand for granite as rubble ashlar has grown to such an extent that many granite quarries are now giving special attention to the production of this class of masonry material. One and two man rubble, specially split to appropriate sizes and shapes, eliminates much of the expensive shaping and trimming on the job formerly required when waste stone was used for this purpose, and enables competent masons to lay it up in the wall with minimum cost and excellent architectural effects.

There are many forms of rubble ashlar walls. The pattern and style of jointing and the color and texture effects obtainable in granite are practically unlimited. Broken range rectangular ashlar in rock-face, split-face, quarry-face or combinations of these faces, constitute the major demand and is rapidly becoming a regular product of our building granite quarries. Its extensive use for churches, schools, residences, apartment houses, retaining walls and bridges, indicates the increasing interest of architects and owners and the need for practical information as to its production, specification and economical use.

A digest of practical points with sketches illustrating the more typical methods of using this material economically is given here for the information of specification writers and designers.

Specification Pointers

Material—Specify granite by name or by color and grain. Specify sound quarry stock free from seams or defects which would impair strength. Permit reasonable variations in color and texture. If special variegated effect is desired, describe same.

Type of Ashlar—Many types of ashlar walls are used. Three types of rectangular broken range ashlar are illustrated below. Specify type desired and whether it is to be rock-face, split-face, quarry-face or a combination of these.

Dressing—Roughly squared as to length and rise. Beds and joints split or pitched approximately square to face. Faces pitched out-of-wind. No drill holes to show on face.

Thickness—Range of 4 to 8 in., average about 6 in.

Bonding—At least one bond stone, about twice average thickness of ashlar, for every square yard of wall surface. Where type of wall will not permit bond stones, anchor granite to backing with rust-proof, corrugated metal wall ties.

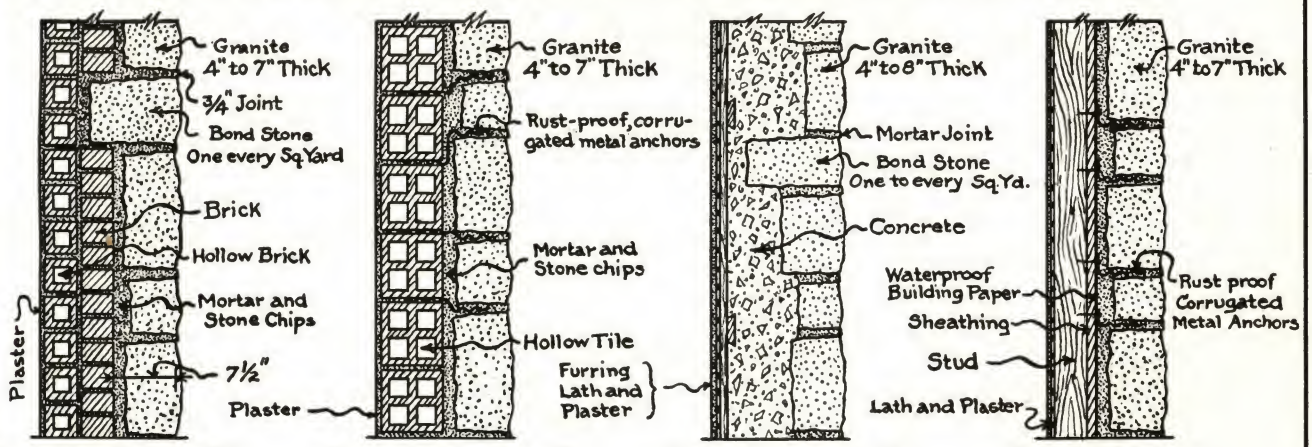
Jointing—Allow ¾ or 1 in. for beds and joints. Permit reasonable variations over and under specified joint thickness, provided variation does not mar general appearance of wall after pointing-up.

Setting—Set in full bed of mortar, tap firmly to solid bearing and thoroughly fill end joints with mortar.

Setting Mortar—One part cement, two parts sand, thoroughly mixed and brought to putty-like consistency with clean water. If desired one part slaked lime putty or hydrated lime putty may be included. Rake out joints to depth of ¾ in. for pointing. Keep face free from mortar.

Cleaning and Pointing—Clean down thoroughly after setting and point-up with any approved type of pointing desired. For average work a ¾-in. flat bead pointing is recommended. Forbid use of wire brushes, acids or solutions which might discolor the granite.

ROCK FACE BROKEN RANGE ASHLAR WALLS
USING ONE & TWO-MAN GRANITE RUBBLE



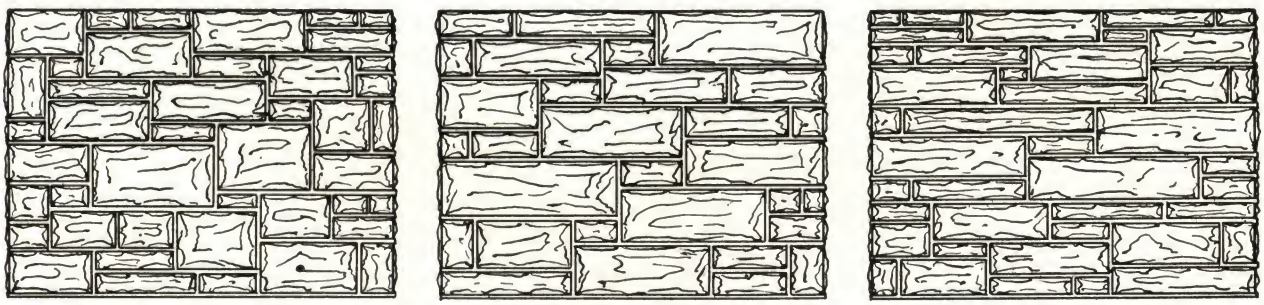
Granite backed with Brick & Hollow Brick

Granite backed with Hollow Tile

Granite backed with Concrete

Granite Veneer on Wood Frame

TYPICAL WALL SECTIONS



Typical Wall Pattern
Rise 6" to 18"
Length 1½ to 2 times rise

Moderate Elongated Pattern
Rise 6" to 16" High pieces averaging 12".
Length about three times rise

Extreme Elongated Pattern
Rise 4" to 12". Length five to six times rise. Wall leveled every 22".

ELEVATIONS-SHOWING STYLES OF FACE JOINTING

GRANITE SPECIFICATIONS

SHORT FORM FOR REGULATION CUT GRANITE WORK

The Association has prepared a complete form of granite specifications for use on projects of major importance and of monumental building grade which is available on request. The following short form has been prepared as more convenient for ordinary use while still conforming to requirements of high grade work of the type classified herein as good commercial grade.

(1) **Work Included**—The work to be done shall include the furnishing, delivery, and setting of all granite work required by the drawings and specified herein. (State portions of work to be of granite and note any exceptions about which there might be any questions.)

(2) **Material**—The granite shall be sound and of good quality, free from defects which would impair the strength, durability, or appearance of the work, and equal to the approved sample. In estimating, the contractor shall state the name of granite and quarry, upon which his proposal is based. The following granites will be considered: (mention color, tone and grain) granite from (mention locality).

(3) **Samples**—Submit in duplicate, for the architect's approval, samples of the granite showing the extreme variation in quality, color and texture to be used under the contract, and showing the specified finishes. (State size of samples required.)

(4) **Shop Drawings**—The granite contractor shall prepare all necessary shop drawings, showing in detail the jointing, bonding, and construction of the granite work, and special anchoring. These shall be submitted to and approved by the architect before any cutting is done.

(5) **Finishes**—The exposed surfaces of the granite shall be finished as indicated on the drawings or specified herein.

Note: State finishes desired.

(6) **Cutting**—All exposed surfaces shall be out-of-wind, free from waves, projections, or depressions and flush at the joints. Arrises shall be cut sharp and true to square or pattern, and continuous with adjoining arrises.

(7) **Bed and Joints**—Beds shall be cut full and square for at least 2 in. from face, and may fall off not to exceed 1 in. in 12 in., reasonably free from large depressions. Joints to be full and square at least 1½ in. from face, falling off not to exceed 1½ in. in 12.

(8) Backs of granite shall be scabbled or split to approximately vertical surfaces.

(9) Jointing shall be as shown on approved drawings and ¼ in. in thickness.

(10) **Bonding**—Shall be as shown on approved drawings, with no bed less than 4 in. Projecting course shall have beds at least equal to projection, unless otherwise shown.

(11) **Mouldings**—Shall be cut with uniform profile throughout their lengths, in conformity with full size details, with lines true and straight, and flush at joints.

(12) **Washes and Drips**—Washes shall be cut on stones whose top surfaces are exposed, unless otherwise shown. Projecting stone shall have groove drip cut on underside.

(13) Raised seats or lugs shall be cut where stone work rests on projections or washes, and raised thresholds shall be cut on exterior door sills.

(14) Reglets shall be cut for flashing where shown or required.

(15) **Models**—Full size plaster models of all ornamental and carved work shall be furnished to the granite contractor, who shall preserve these models for reshipment to the building, if required.

(16) **Roughing for Carving**—This shall be done from approved models only, leaving the stone in suitable form and condition for the carving.

(17) **Carving**—All carved ornament shall be executed by skilled carvers, in a spirited and artistic manner, and in strict conformity with the approved models.

(18) **Crating and Shipping**—The finished granite shall be properly crated for shipment, to protect the surfaces and edges of all exposed work.

(19) **Precaution Against Stain**—Precaution shall be taken at all times to protect the granite from stain.

(20) Under no circumstances shall salt be used for thawing out lewis-holes, or otherwise in connection with the granite work.

(21) (If dampproof painting is required, specify requirements here.) After setting, the backs of all mortar joints shall be suitably dampproofed to prevent moisture from the backing seeping through the joints.

(22) **Setting**—The setting of the granite work shall be done by competent, experienced stone setters, and in strict accordance with the approved drawings and specifications.

(23) Each granite stone shall be brushed clean and thoroughly drenched immediately before setting and carefully bedded in a full bed of non-staining mortar. The granite facing shall not be built up more than two courses ahead of the backing, and the faces shall be kept free of mortar at all times.

(24) All surplus mortar shall be immediately raked out to a depth of at least 1 in. Sills, etc., subject to pressure shall be bedded only at the ends.

(25) Where a joint is exposed to the weather, it shall be made waterproof by mixing a satisfactory waterproofing compound with the mortar.

(26) The sand used in all setting mortar shall be such as will cause no stain, or chemical action with the cement.

(27) **Anchoring**—The granite shall be anchored to the backing with galvanized iron anchors, ¼x1¼ in., turned down into the granite 1¼ in., extending 8 in. into the backing if possible, and turned up into the backing 1½ in. There shall be two anchors to each stone whose length exceeds its height and, in general, not less than two anchors to every superficial yard of ashlar. All anchors, bolts, ties, etc., shall be furnished to the granite contractor.

Note: Special anchoring for heavy cornices and overhanging courses, cramps, dowels, etc., for parapets, balustrades, pilasters, columns, etc., should be suitably described or shown according to the requirements of the work.

(28) **Boxing and Protection**—All the granite work shall be protected by the general contractor during the progress of the work and until the completion of the building. No lumber or material shall be used which will in any way stain or deface the granite work.

(29) **Centers and Scaffolding**—All necessary forms, centers, scaffolding, etc., required by the setter or carver, will be furnished by the general contractor.

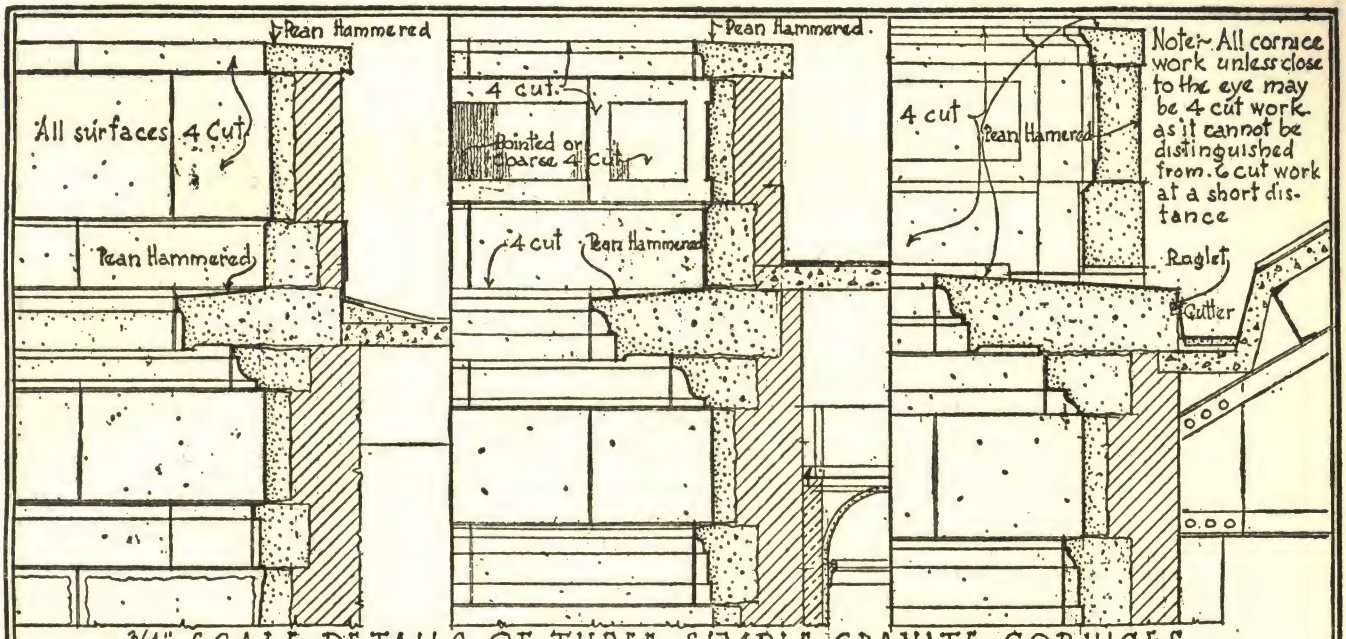
(30) **Pointing and Cleaning**—After all liability from stain or damage from other operations on the building is passed, the granite work shall be carefully cleaned, removing all dirt, mortar stains and other defacements. The use of wire brushes, acids, and solutions which might cause discoloration, will not be permitted.

(31) All face joints shall be brushed out, thoroughly wet with clean water, and carefully pointed as directed by the architect.

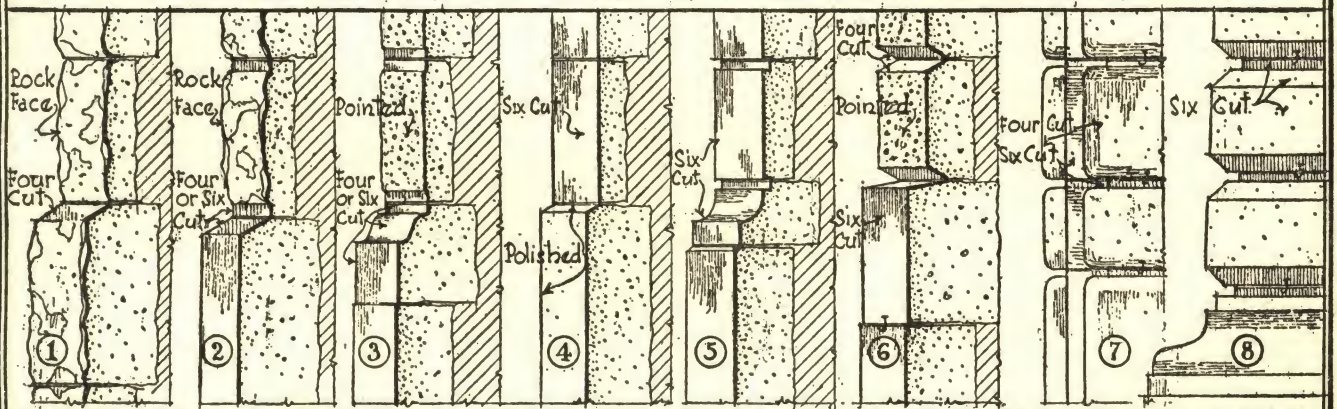
Note: See long form for special treatment of vertical joints in uncovered cornices, and joints in upper surfaces of projecting stones.

(32) **Defective Work**—No patching or hiding of defects will be permitted.

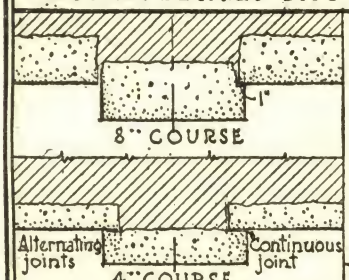
Defective stones shall be replaced with perfect ones, unless otherwise directed by the architect.



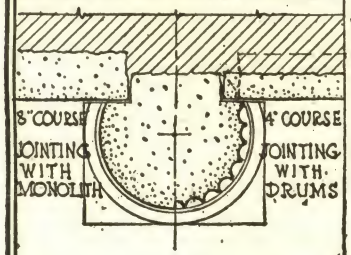
3/4" SCALE DETAILS OF THREE SIMPLE GRANITE CORNICES



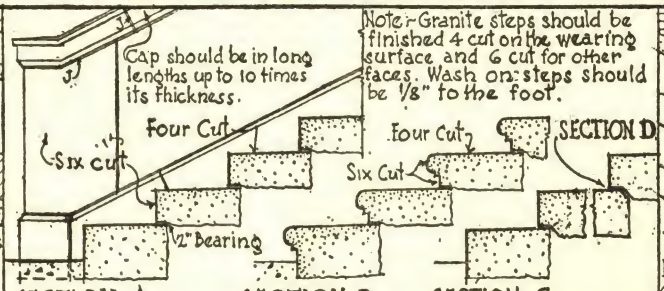
3/4" SCALE DETAILS SHOWING VARIOUS SURFACES, BASES AND RUSTICATIONS FOR GRANITE



METHODS OF BONDING PILASTERS

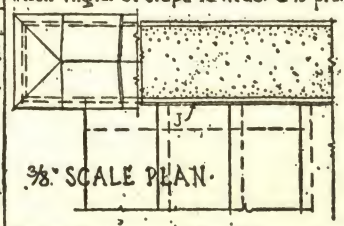


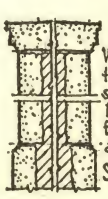
3/8" SCALE PLANS OF BONDS OF PILASTERS & COLUMNS



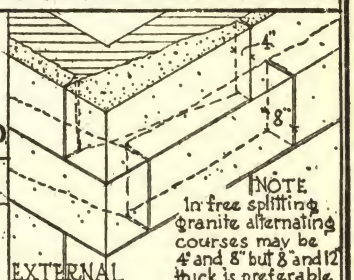
SECTIONS SHOWING BEARINGS FOR GRANITE STEPS

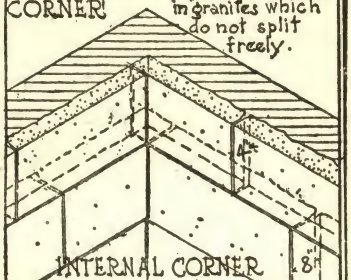
Note: Bearings shown at C & D are used to prevent sliding of stones when flight of steps is wide: C is practical and less expensive than D





3/8" SCALE DETAILS OF TYPICAL STAIR CONSTRUCTION





1/4" SCALE DETAILS SHOWING BONDING OF CORNERS

DRAWN BY SWEETS CATALOGUE SERVICE, INC.	TYPICAL GRANITE DETAILS SHOWING PRACTICAL METHODS OF CONSTRUCTION	SCALE:- 3/8 & 3/4 EQUAL 1'-0" DATE:- JUNE-20	DRWG 3

ARCHITECTURAL GRANITE

This catalogue has been prepared and placed in SWEET's by the NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION, INC. to the end that reliable and unbiased information concerning granite and its architectural uses may be readily available to architects and others interested.

The information herein is based upon the combined experience and practical knowledge of the member companies whose joint support and co-operation make this and other services of the Association possible and valuable alike to the granite industry and to users of its products.

MEMBERS

BOOTH BROS. & HURRICANE ISLE GRANITE CO.
COOK, WATKINS & PATCH, INC.
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ASSOCIATE MEMBER

A. LE POIDEVIN & CO., INC.

The latest edition of our booklet, "Architectural Granite," containing, in addition to the information included here, twenty-three color plates of standard building granites produced by Association members will be gladly sent upon request.

NATIONAL BUILDING GRANITE QUARRIES ASS'N, INC.

31 STATE STREET, BOSTON, MASS.

AMERICAN BLACK GRANITE COMPANY

GENERAL OFFICES AND PLANT

ASHLAND, WISCONSIN

SALES OFFICES IN PRINCIPAL CITIES

Description of Product

Rosetta Black Granite (formerly Mellen Black Granite) is an extremely hard brilliant granite composed of black and deep gray crystals closely packed together and characterized by an occasional fleck of mother of pearl. There is just enough irregularity in the crystals to create an interesting and pleasing texture. Rosetta Black Granite is never monotonous.

Examined at very close range, the color is seen to be a deep gray, just off black. When seen at a distance, the color is a rich lustrous black. It is important to note that this granite owes its color partially to polishing and the refraction of light through its crystals. This, as well as its density protects the color against fading and discoloration.

Rosetta Black Granite weighs 210 pounds per cubic foot. Due to its great density, it will take a very high polish which it will hold indefinitely. The most modern machinery and high production standards at the plant insure a surface free from checks, cracks or any imperfection.

Adaptability

Rosetta Black Granite is peculiarly adapted to modern building requirements. As a base course, it is superior to lighter stones which fade with time and become discolored by the infiltration of rust, grease and city dirt. Time leaves Rosetta Black Granite as brilliant and flawless as the day it left the polishing table.

Architecturally, the adaptability of this stone is remarkable. Its distinctive color and brilliant finish harmonize with present tendencies in design. It is truly the most modern of all building granites. Where contrast is essential to the design, Rosetta Black Granite is striking and interesting. On the other hand, it will blend well with other stones of practically any color. Monel Metal, bronze and other metals have been most successfully used in conjunction with black granite.

Quarry

The quarry, at Mellen, Wisconsin, has been operated for ten years and includes 200 acres of exposed granite. When the American Black Granite Company acquired the property, it was completely equipped with the most modern machinery obtainable with a view to securing prompt delivery to the finishing plant of rough blocks in any desired quantity and size.

Blocks weighing up to 200,000 pounds are carried on the company's own freight cars over the Soo Line Railway, to the finishing plant at Ashland, Wisconsin.

The finishing plant belonged formrerly to the Charcoal Iron Company of America and is served by four railroads as well as docks on Lake Superior. Shipping facilities are unexcelled.

Only the latest devices for the manufacture of granite have been installed in the finishing plant. Gang saws, polishing machine, lathes, carborundum machines, compressors for pneumatic surfacing and cutting are all equipped with individual electric motors.

The daily capacity is 800 square feet of 4-inch polished material. The plant is in operation 24 hours a day.

Delivery

Over 25,000 square feet of polished material is kept on hand at all times so that deliveries can be made at short notice on all except unusually large contracts. In the case of the latter, the tremendous production capacity of the plant is further assurance of unexcelled despatch in the filling of all orders. The American Black Granite Company prides itself in the matter of delivery and has been able many times to shorten delivery dates by weeks when necessary.

Service Organization

Under the direction of an experienced architect, the Company maintains an excellent drafting department. Preliminary costs, information as to economical design, specification data and samples are promptly accessible to the Architect. The Company welcomes the opportunity to render whatever assistance it can in these respects.

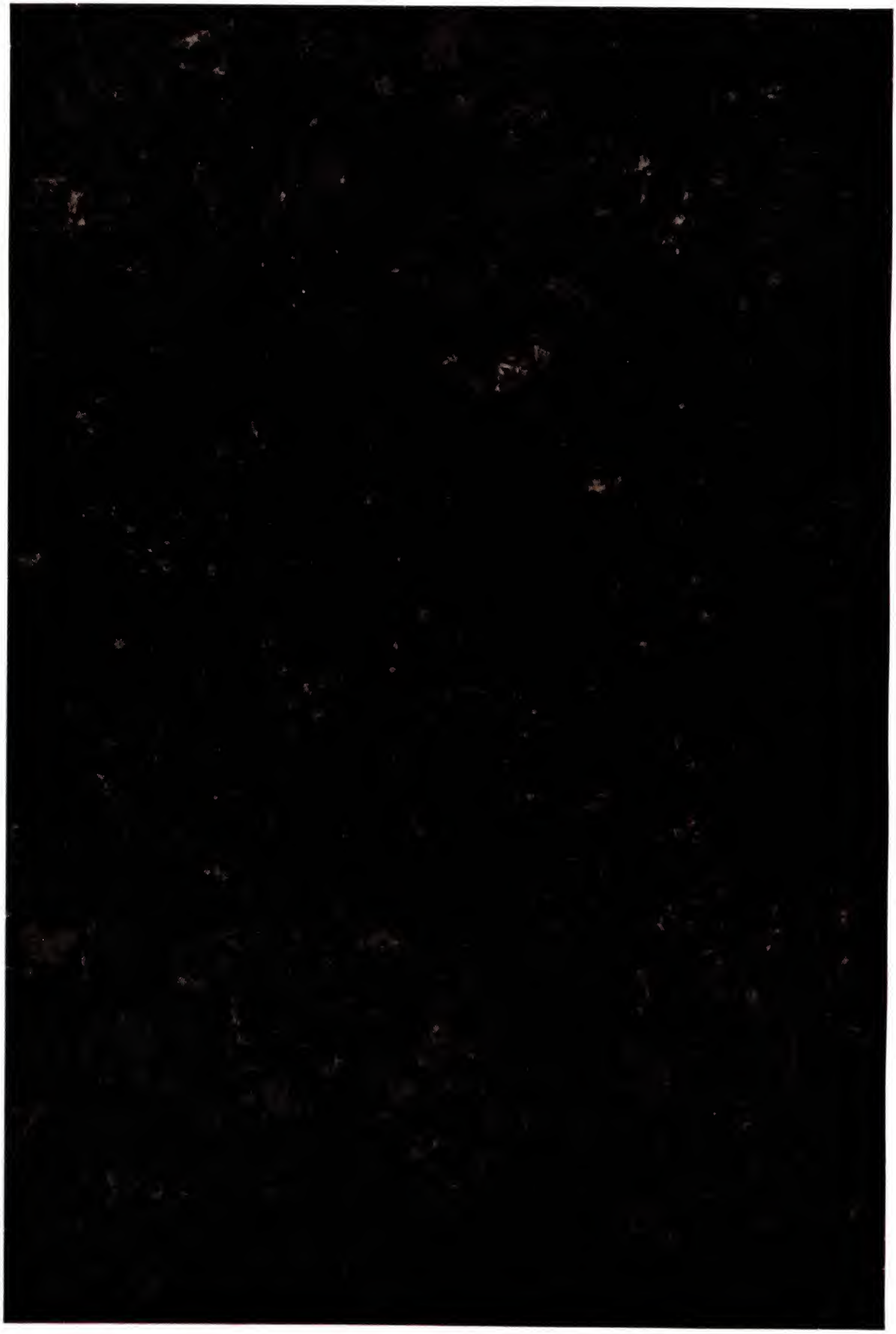
The Company—Its Responsibility

Ample capital and experienced executives insure the Company's stability and the proper execution of any contract irrespective of size. References will be furnished on request.

Outstanding Buildings For Which We Have Furnished Rosetta Black Granite

Northwestern National Bank, Minneapolis; Graham, Anderson, Probst & White.
Pennsylvania Railroad Office Building, Philadelphia; Graham, Anderson, Probst & White.
Ohio Savings Bank & Trust Co., Toledo; Mills, Rhines, Bellman & Nordhoff.
Carew Tower, Cincinnati; Walter Ahlschlager.
Tower Petroleum Building, Dallas; Mark Lemmon.
Second National Bank, Hamilton, Ohio; Weary and Alford.
Western Union Building, Boston; Stone-Webster Engineering Co.
Women's City Club, St. Paul; Magnus Jemne.
Mutual Home & Savings Bank, Dayton; Schenck & Williams.
Fifth-Third Union Trust Co. Bldg., Cincinnati; Graham, Anderson, Probst & White.
Capitol Square Building, Columbus; Richards, McCarty & Bulford.
Scarbrough Building, Austin, Texas; Wyatt C. Hedrick, Inc.
Meany Hotel, Seattle; R. C. Reamer.
1200 Market Street Building, Philadelphia; Howe & Lescage.
Albrecht Store, St. Paul; Magnus Jemne.
Iowa-Des Moines Bank and Office Building, Des Moines; Proudfoot, Rawson, Souers & Thomas.
State Office Building, Hartford, Connecticut; Smith & Bassette.
McKelvey Store, Youngstown, Ohio; The Owsley Company.
Syracuse Lighting Co., Syracuse; Melvin King.
City Hall & Court House, St. Paul; Ellerbe & Co.
May Company Building, Cleveland; Graham, Anderson, Probst & White.

ROSETTA BLACK GRANITE



COLD SPRING GRANITE COMPANY, INC.

Quarriers and Producers of Granite

GENERAL OFFICES AND PLANT

COLD SPRING, MINN.

SALES OFFICES

CHICAGO, ILL., 228 No. La Salle Street

ST. LOUIS, MO., 2041 Railway Exchange Building

Products

COLD SPRING RAINBOW GRANITE.
COLD SPRING PEARL PINK GRANITE.
COLD SPRING PEARL WHITE GRANITE.
COLD SPRING PEARL BLACK GRANITE.

Chemical Analysis

Silica	62.15%	Lime	2.27%
Alumina	19.41%	Phosphorus	.13%
Iron oxide	2.99%	Magnesia	trace

Absorption Test

4-23-24 to 4-30-24

Weight air dry, grains	Weight after immersion of one hour, grains	Weight after immersion of one day, grains	Weight after immersion of one week, grains	Total gain in weight, grains	Per cent gain
1944	1945.5	1945.5	1945.5	1.5	.07

The weight is the same after a week as it is after an hour. Gain in weight appears to be due to surface moisture only; no moisture being absorbed.

Uses

Building construction of every kind. Ashlar, facings, doorways, trim, sills, steps, stairways, floor tile, columns, mantels, fountains, and all other architectural, structural and memorial purposes.

Quarries

Location—Located within convenient proximity to the cutting plant in Cold Spring, Minnesota.

Equipment—Are fully developed and completely equipped with the best and most modern quarry machinery available. The drilling and broaching system of quarrying is used exclusively, instead of blasting, which eliminates all possibility of shattering. Our derricks have lifting capacity of more than 100 tons.

Size of Stock—The size of blocks obtainable is limited only by the restrictions of railroad transportation.

Operated Year Round—The granite is not affected by weather conditions and quarries and finishing plant operate throughout the year.

Finishing Plant

Capacity—Our cutting plant is one of the largest and best mechanically equipped in America. Capable of handling promptly and efficiently contracts of any size. Have capacity for handling single pieces of more than 75 tons.

Equipment—Modern gang saws, circular carborundum saws, planers, and various kinds of special, modern machines are employed in the production of cut granite. Many of the finishes are produced entirely by machinery.

Transportation

Railroad connections are convenient for shipping to any point in the United States with the least possible delay.

Stock

A large stock of blocks, also sawed and polished slabs, from two inches in thickness up, is maintained at all times, assuring prompt delivery of finished work.

Economies

The modern methods of quarrying employed in reducing waste and producing quarry stock of approximately true rectangularity together with the modern cutting and finishing process, most of which are accomplished by machine, reduces the hitherto high cost of the old hand methods in producing both cut and polished granite to a reasonable basis.

No excess stock is shipped due to the sawing of the stock to uniform thickness, which depending on its use and location may be as thin as two inches.

Cold Spring Pearl Black Granite—Description

Cold Spring Pearl Black Granite is a medium textured granite. Takes a very high and permanent polish; is a decided black at a distance of ten feet, but on close inspection has a sparkle and variation in grains from dark blue pearl through dark green and very slight brown to jet black.

White metal and limestone will harmonize and bring out the blue and jet black, while bronze will harmonize with the green and brown.

This granite is available in any size and quantity, with quick shipments possible from large stock of blocks.

Cold Spring Pearl White Granite—Description

Of medium texture and extreme hardness. Like all Cold Spring Granites takes a high and absolutely permanent polish, impervious to stains or discolorations.

Polished finish produces a light gray color of unusual character and beauty.

The sawed, axed or rubbed surfaces produce an almost pure white finish suitable alike for the finest architectural and memorial work.

Cold Spring Rainbow Granite—Description

Is variegated in color, of a warm general tone ranging from deep black to dark red, but containing, as its name implies, all the colors of the rainbow in beautiful and varying combinations. It is of fine texture and one of the hardest granites produced, and is well adapted to fine carving and ornamentation. It is truly distinctive and outstanding among all granites and is especially desirable for columns and interior as well as exterior work.

When polished, which is its most popular finish, it is particularly attractive.

Cold Spring Pearl Pink Granite—Description

Of medium texture, rich and pleasing color tones consisting of a combination of pink, buff, pearl, white and black appropriate for any architectural treatment. It is exceedingly hard. Cut finishes (other than polished) produce a warm gray tone. It lends itself readily to fine carving and other forms of ornamentation.

Finishes

Sawed—The face finish of stock as it comes from the saws approximates closely the old hand method 4 cut.

Machine Smooth—A very attractive and economical pebbled surface produced by shotting or rubbing the stock after it comes from the saw.

Rubbed—A uniformly smooth surface produced by rubbing with carborundum.

Honed—Fine rubbed with satin finish developed just prior to polishing.

Polished—Permanent high polish.

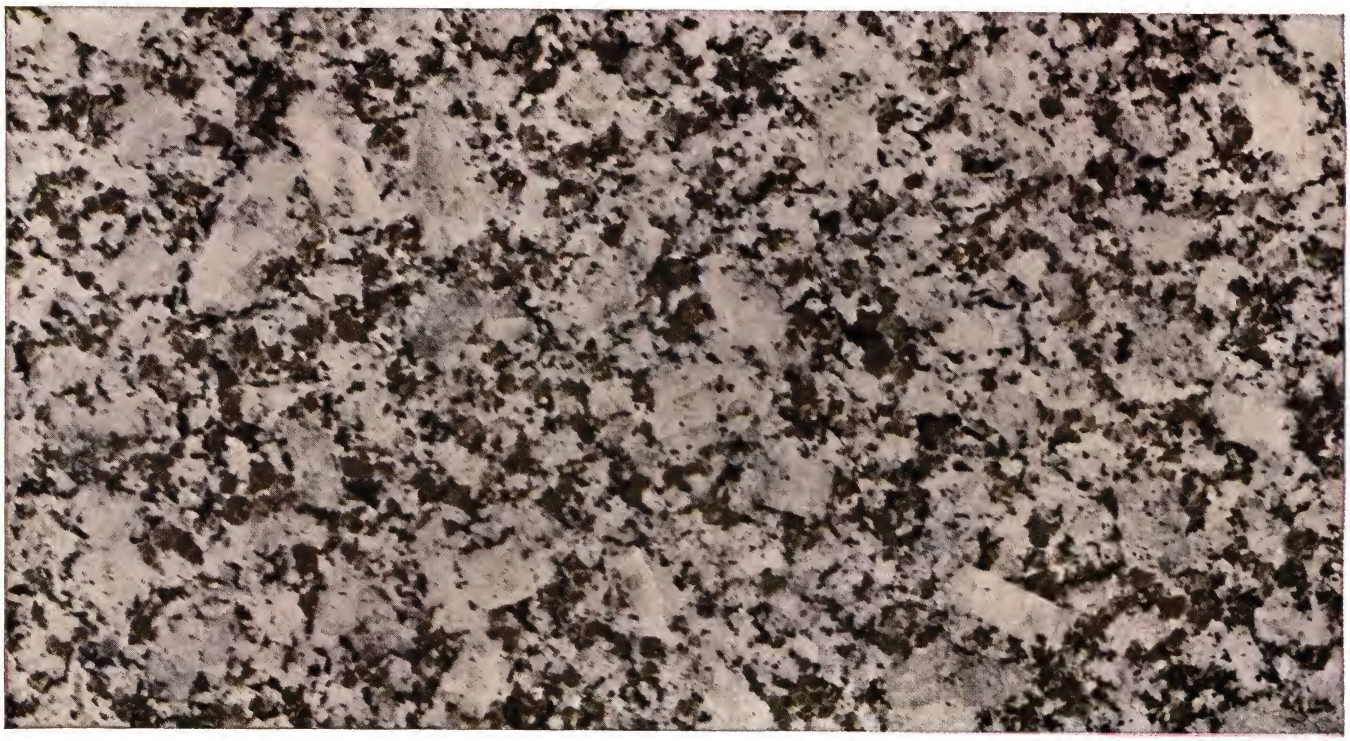
Samples

Samples of stock and finish will be furnished on request.

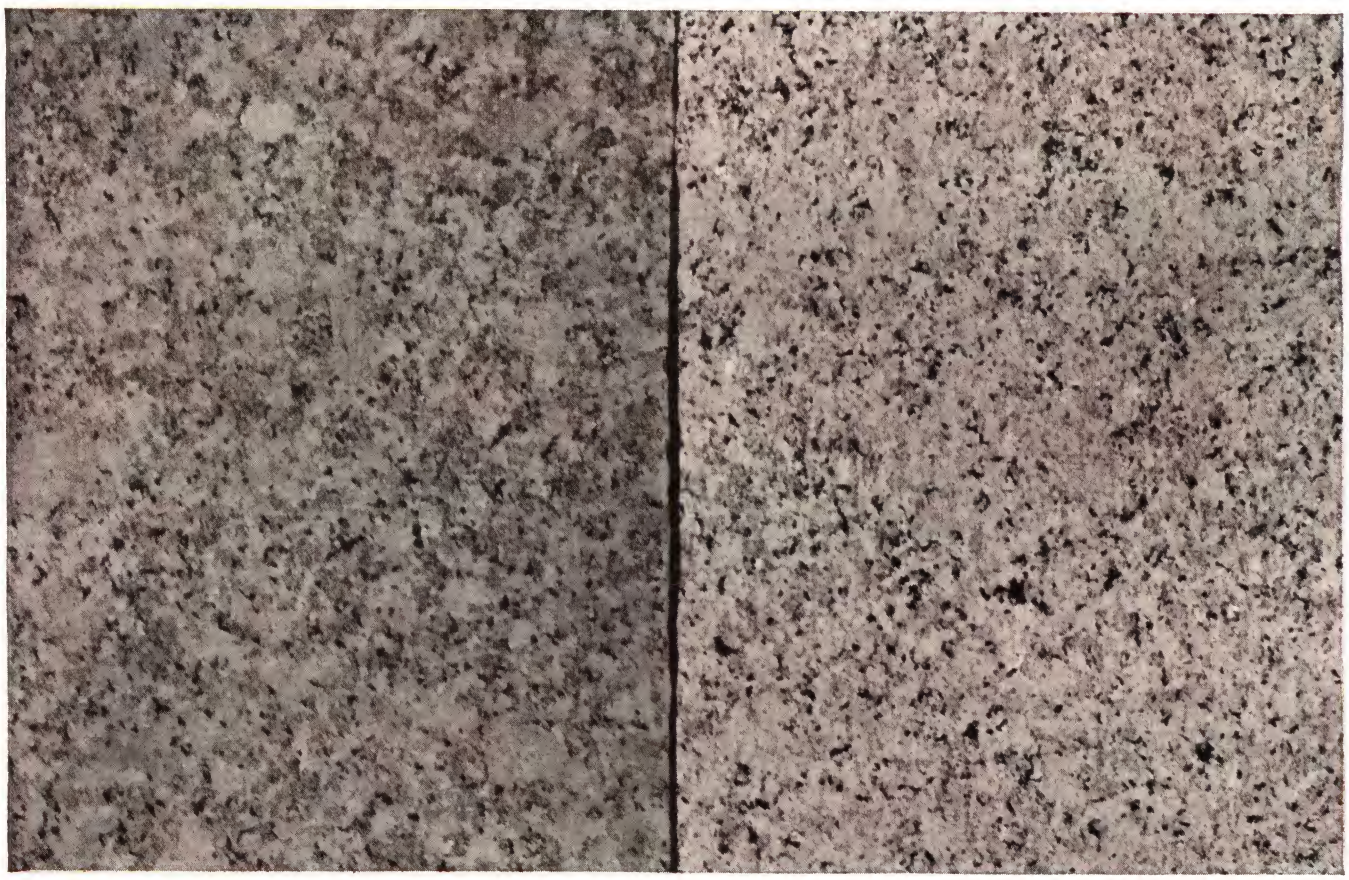
Service

The COLD SPRING GRANITE COMPANY, INC., having in its production, estimating, sales, drafting, traffic and other departments, men experienced and trained in their respective lines and with a sincere desire to co-operate in the fullest measure with architects and contractors offers a complete and efficient service in the use of Granite.

Preliminary estimates and information will be gladly furnished without obligation.



Cold Spring Pearl White Granite Polished Finish



Cold Spring Pearl White Granite
Rubbed Finish

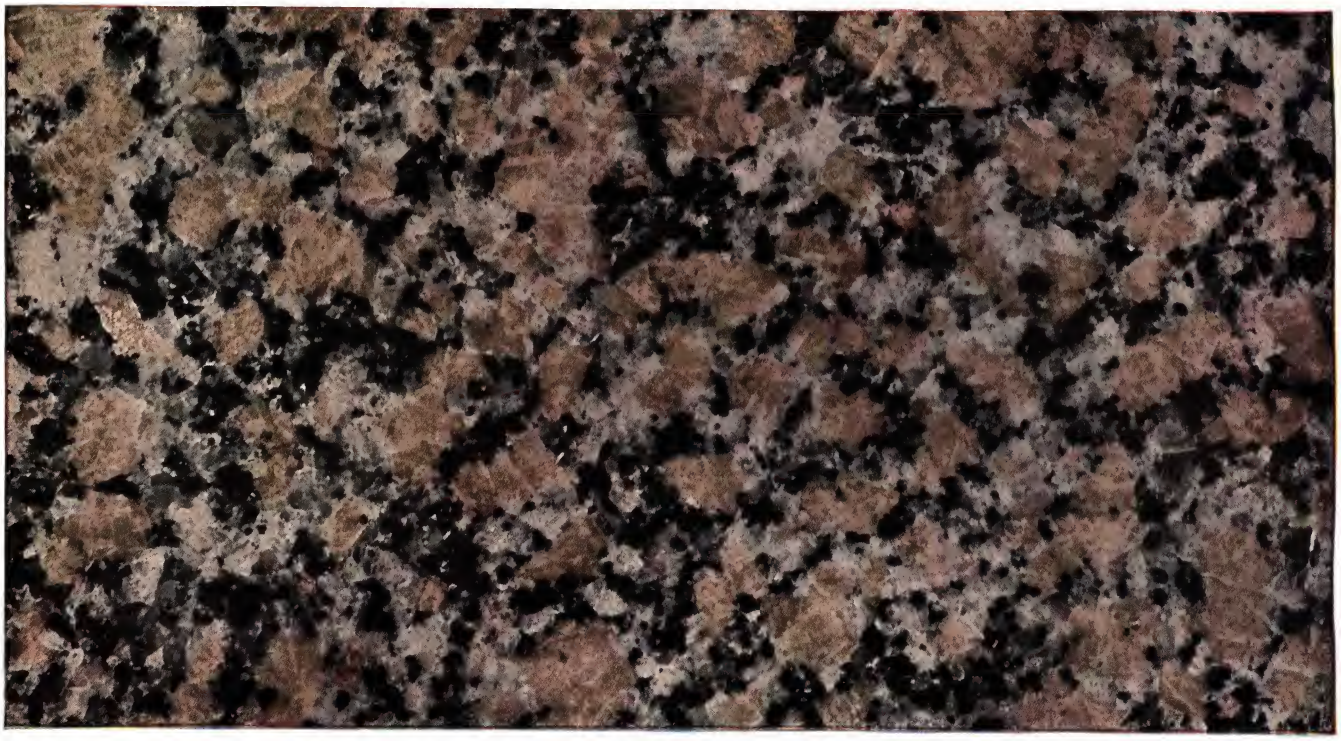
Cold Spring Pearl White Granite
Eight Cut Axed Finish

Produced only by Cold Spring Granite Co., Inc.
Cold Spring, Minn.

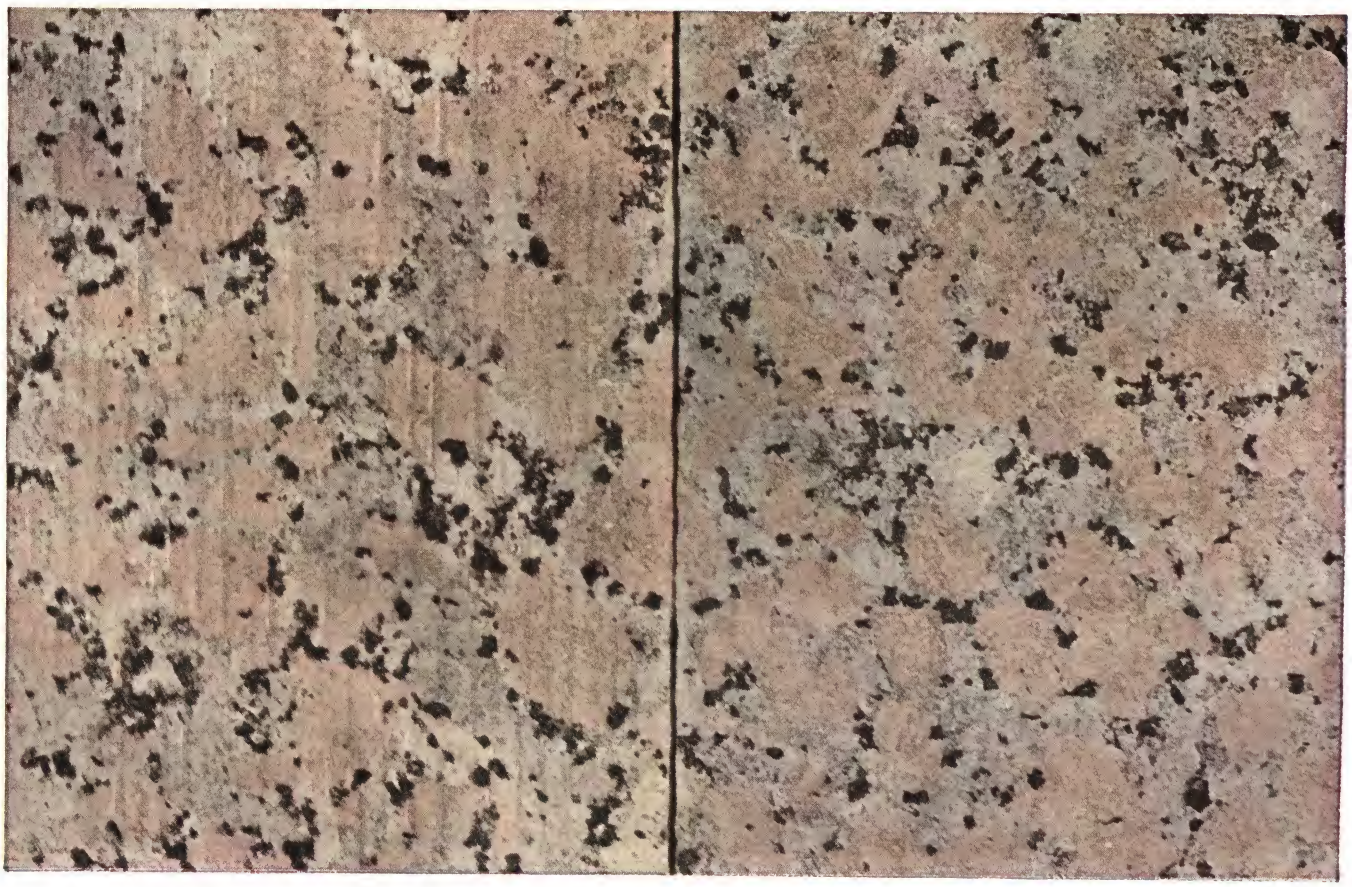
Cold Spring Rainbow Granite Polished Finish

Cold Spring Pearl Black Granite Polished Finish

Produced only by Cold Spring Granite Co., Inc.
Cold Spring, Minn.



Cold Spring Pearl Pink Granite Polished Finish



Cold Spring Pearl Pink Granite
Sawed and Sanded Finish

Cold Spring Pearl Pink Granite
Rubbed Finish

Produced only by Cold Spring Granite Co., Inc.
Cold Spring, Minn.

REFERENCES

Cold Spring Pearl White Granite Used in the Following Buildings

Building	Location	Architect
Office Building, Floral Shop and Gateway, Lakewood Cemetery	Minneapolis, Minn.	Ernest Kennedy
Waite Phillips Building	Tulsa, Okla.	Smith & Senter
Bell Telephone Building	Evansville, Ind.	Vonnegut, Bohn & Mueller
Masonic Temple Building	Shawnee, Okla.	Edward J. Peters
Plaza Investment Building	Jackson, Miss.	N. W. Overstreet
Price Building	Kansas City, Mo.	William R. Bovard
Sherman Office Building	Corpus Christi, Tex.	Hardy & Curran
Hinds County Courthouse	Jackson, Miss.	Claude H. Lindsley
Aviation Building	Fort Worth, Tex.	Wyatt C. Hedrick
Consumers Power Building	Pontiac, Mich.	Stevens & Wood, Inc.
South Side Bank	Scranton, Pa.	P. J. Morris
Capitol Club Office Building	Raleigh, N. C.	Frank B. Simpson
Louisiana State Capitol	Baton Rouge, La.	Weiss, Dreyfous & Seiferth
U. S. Post Office	Bartlesville, Okla.	Jas. A. Wetmore
U. S. Post Office	Clarksburg, W. Va.	Jas. A. Wetmore

Cold Spring Rainbow Granite Used in the Following Buildings

Adler Planetarium	Chicago, Ill.	Ernest A. Grunsfeld, Jr.
McGraw-Hill Building	Chicago, Ill.	Thielbar & Fugard
Gas & Light Building	Milwaukee, Wis.	Eschweiler & Eschweiler
Hemenway Building	Boston, Mass.	Shepard & Stearns
Hartford Gas Company	Hartford, Conn.	Buck & Sheldon
J. E. Simpson Building	Washington, D. C.	W. S. Plager
Southland Hotel	Norfolk, Va.	Peebles & Ferguson
Watts Building	Birmingham, Ala.	Warren Knight & Davis
Walthall Hotel	Jackson, Miss.	N. W. Overstreet
Bankers Guarantee Title & Trust Co.	Akron, Ohio	Good & Wagner
St. Mary's Church	Shelby, Ohio	Howard W. Germann
Holy Name Church	Columbus, Ohio	Edward A. Ramsey
St. Louis University Medical Building	St. Louis, Mo.	Widmer Engineering Co.
Dallas National Bank Building	Dallas, Tex.	Coburn, Smith & Evans
Stuart Building	Lincoln, Neb.	Davis & Wilson
Pickwick Theatre	Park Ridge, Ill.	Zook & McCaughey
St. Basil's Church	Chicago, Ill.	J. W. McCarthy
David Stott Building	Detroit, Mich.	Donaldson & Meier
Sacred Heart Cathedral	Superior, Wis.	Louis Preus
Oklahoma Natural Gas Building	Tulsa, Okla.	A. M. Atkinson
N. W. Telephone Building	Minneapolis, Minn.	Hewitt & Brown, Inc.
Northern States Office Building	St. Paul, Minn.	Ellerbe & Company

Cold Spring Pearl Pink Granite Used in the Following Buildings

Merchandise Mart	Chicago, Ill.	Graham, Anderson, Probst & White
Board of Trade Building	Chicago, Ill.	Holabird & Root
Jefferson County Courthouse	Birmingham, Ala.	Holabird & Root
Criminal Courts Building	New Orleans, La.	Diboll & Owen
Ford Museum Buildings	Dearborn, Mich.	Robert O. Derrick
Cadillac Building	Boston, Mass.	Albert Kahn
New York Central R. R. Passenger Station	Buffalo, N. Y.	Fellheimer & Wagner
Gallinger Hospital	Washington, D. C.	Municipal Architect
Koppers Building	Pittsburgh, Pa.	Graham, Anderson, Probst & White
City Hall	Columbus, Ohio	Allied Architects Association
Union Central Life Insurance Building Annex	Cincinnati, Ohio	Garber & Woodward
Chamber of Commerce	Jacksonville, Fla.	Roy A. Benjamin
Southwestern Bell Telephone Building	Dallas, Tex.	Lang & Witchell
First National Bank Building	San Jose, Calif.	Willis & Jackson
Home Telephone & Telegraph Building	Pasadena, Calif.	John & Donald Parkinson
Youngs Market Building	Los Angeles, Calif.	C. F. Plummer
U. S. Post Office	Missoula, Mont.	James A. Wetmore
Oklahoma Gas & Electric Building	Oklahoma City, Okla.	Layton, Hicks & Forsyth
New Bismarck Hotel	Chicago, Ill.	Rapp & Rapp
U. S. Post Office and Courthouse	Des Moines, Iowa	Jas. A. Wetmore
Schroeder Hotel	Milwaukee, Wis.	Holabird & Roche
City Hall	Duluth, Minn.	Thos. J. Shefchik

Cold Spring Pearl Black Granite Used in the Following Buildings

First National Building	Oklahoma City, Okla.	Weary & Alford
Bond Store	Chicago, Ill.	The Kawneer Co.
Courthouse	Mt. Clemens, Mich.	Geo. J. Haas
Building & Loan Building	Xenia, Ohio	McCurran Bros.
City Hospital	Springfield, Ohio	Marley W. Lethley
Feibleman Store	New Orleans, La.	Moise H. Goldstein
Pere-Marquette Building	Minneapolis, Minn.	Larson & McLaren
Stark Dry Goods Store	Canton, Ohio	Albrecht & Wilhelm
Petrolagar Laboratory	Niles Center, Ill.	Olsen & Urbain
Scott Store	Cleveland, Ohio	Scott Stores, Inc.
Erie Avenue Office Building	Philadelphia, Pa.	Clarence Wunder
Gross Building	Milwaukee, Wis.	Kirchhoff & Rose
Skirvin Hotel	Oklahoma City, Okla.	Layton, Hicks & Forsyth
Post Crescent Building	Appleton, Wis.	Foeller, Schober & Berners

ESTABLISHED 1890

COOK, WATKINS & PATCH, INC.

221 Columbus Avenue, BOSTON, MASS.

IMPORTING OFFICES: CARRARA, ITALY AND ABERDEEN, SCOTLAND

PLANTS AT BARRE, VT.

Products

GRANITE: Barre, American Black, Deer Island, Keystone Green, Imported Blacks and Reds, Westerly.

Barre Granite

The granite that retains its natural color after many years' exposure to the weather. Works well in either polished, hammered, vellum or rock-faced finish.

Long recognized as "The King Among Granites."

Vellum Finish

A new finish developed by our company which preserves the natural color of the granite. Gives a smooth finish equal to polish but without the gloss. Weathers equal to polish. Especially adapted to sand blast.

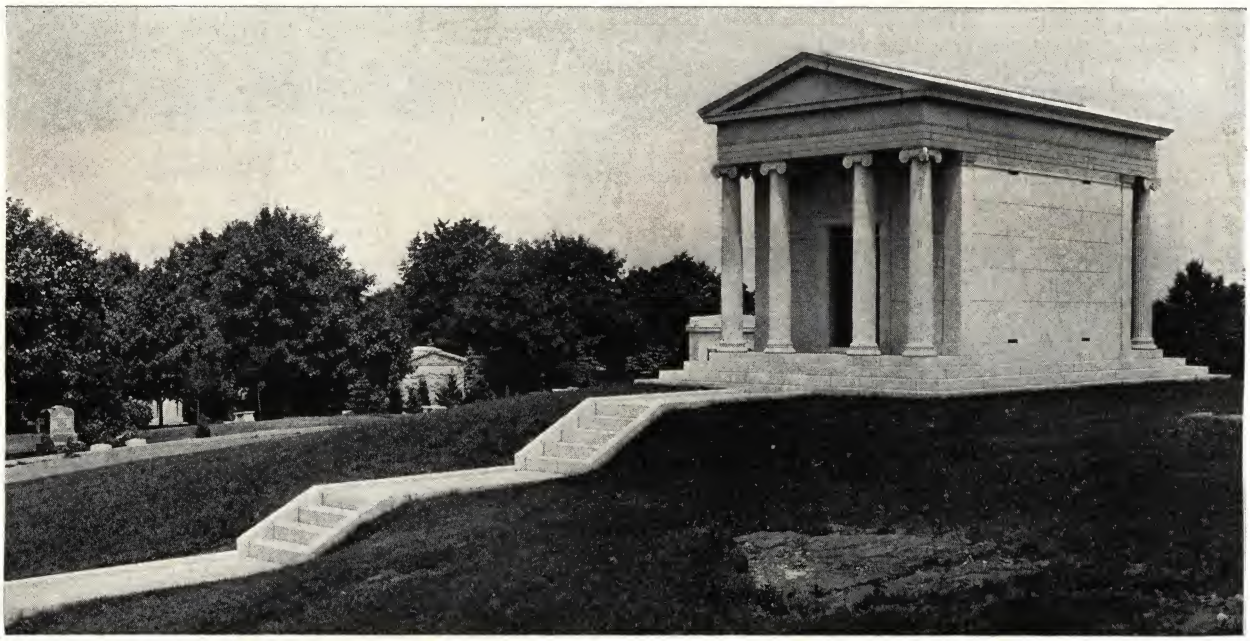
Service and Facilities

Designing and Architectural Departments—Our wide experience covering a period over forty years is at the disposal of interested architects through our drafting department in connection with the use of granite in buildings.

Plant Facilities—50,000 sq. ft. of shed space. Capacity: 1000 ft. of sawing, 800 ft. of polishing per day. Full line of machinery—gang saws, circular saws, carborundum and sand-blast machines.

Estimates and Samples

Estimates and samples are supplied promptly.



E. F. Albee Mausoleum, Kensico Cemetery, New York
Designed and executed by COOK, WATKINS & PATCH, INC.

References

West Philadelphia Title & Trust Building, West Philadelphia, Pa., Metzger, Fisher & White, Architects.

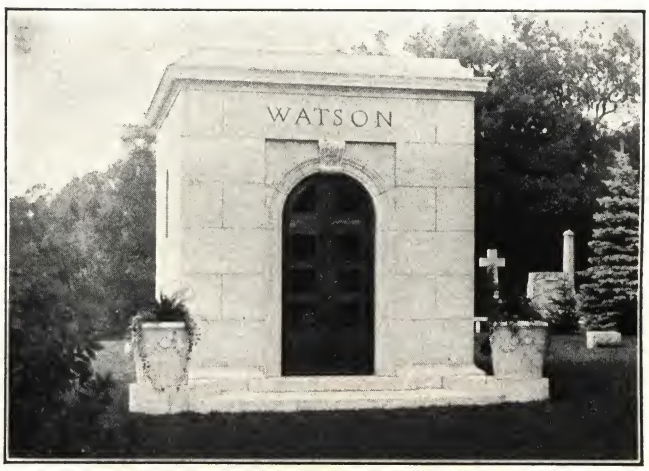
Syracuse City Bank & Trust Building, Syracuse, N. Y., N. P. Cross, Architect.

Marshall Field Addition, Chicago, Ill., P. E. Kemp, Contractor.

Vermont State Building at Eastern States Exposition Grounds, West Springfield, Mass., W. H. McLean, Architect.

Porteous, Mitchell & Braun Department Store, Portland, Me.

New York Times Building, Brooklyn, N. Y., Albert Kahn, Architect.



Watson Mausoleum of Smith Barre Granite

Medical Arts Building, Rochester, N. Y.

E. F. Albee Mausoleum, Kensico Cemetery, New York, N. Y., designed and executed by us.

Charles Comiskey Mausoleum, Chicago, Ill.

Keim Mausoleum, Philadelphia, Pa.

Bishop Miner Mausoleum, Flint, Mich.

Winslow Mausoleum, New York, N. Y.

Corseglia Mausoleum, New York, N. Y.

Reed Mausoleum, Brockton, Mass.

Stocke Mausoleum, St. Louis, Mo.

ESTABLISHED 1889

DEACON BROTHERS, INC.

INCORPORATED 1924

JOHN R. DEACON, Manager

Manufacturers, Cutters and Finishers of Building and Monumental Granite

307-323 Centre Street, QUINCY, MASS.

Materials

We use in manufacturing, the various Quincy Granites from the quarries situated in our home city and granites from other New England quarries.

We make a specialty of carrying a supply of slabs of Goss Pink Deer Isle Granite sawed, polished, and ready to be cut into store fronts and base courses.

Facilities

Our plant is the largest in the city, occupying a whole city block and consists of a modern cutting plant, polishing mill, saw and carborundum equipment.

We are situated so that we can easily ship by rail or water (from Boston) to any point in the United States, and locally by our own motor transportation within 150 miles.

Organization

We are known as the "Quality Manufacturers" on account of the quality of work we produce.

The polish on granite produced at our plant is of the highest gloss obtainable. This quality is *maintained at all times.*

The firm was founded in 1889 by the late William H. Deacon and has been operated continuously by the same family to this day.

Estimates

Estimates on granite work and samples on request.

The Palmer House, Chicago, Ill.

Granite used in the lower courses of this hotel was furnished by DEACON BROTHERS, INC.

A Few Representative Installations

BUILDING	ARCHITECT
Hotel Statler, Boston, Mass.	George B. Post & Sons, Boston, Mass.
Palmer House, Chicago, Ill.	Holabird & Roche, Chicago, Ill.
First National Bank, Northampton, Mass. Granite Trust Co. Bank, Quincy, Mass.	J. William Beal Sons, Boston, Mass.
Southwestern Bell Telephone Co. Building, St. Louis, Mo.	Mauran, Russell & Crowell and I. R. Timlin, Associated
Hibernia Bank Building, New Orleans, La.	Favrot & Livaudais, Ltd.
Union League Club Building, Chicago, Ill.	Mundie & Jensen, Chicago, Ill.
Houston Post-Dispatch Building, Houston, Tex.	Sanguinet, Staats, Hedrick & Gottlieb, Houston, Tex.
City Savings Bank & Office Building, Alliance, Ohio	Simons, Britain & English, Inc., Alliance, Ohio
National Mount Wollaston Bank, Quincy, Mass.	Thomas M. James Co., Boston, Mass.
Pontiac Michigan Central Office, Detroit, Mich. Mack Avenue Telephone Exchange Building, Detroit, Mich.	Smith, Hinchman & Grylls, Detroit, Mich.
J. A. Mercier Office Building, Detroit, Mich.	Donaldson & Meir, Detroit, Mich.
The Corning Building, Hartford, Conn.	Whiton & McMahon, Hartford, Conn.
H. P. Hood & Sons Co. Building, Charlestown, Mass.	Monks & Johnson and Kilham, Hopkins & Greeley, Boston, Mass.
National Bank of Commerce Building, Detroit, Mich.	C. Howard Crane, Inc.
Atlantic National Bank Addition, Boston, Mass.	Thomas M. James
West End Telephone Building, Boston, Mass.	Densmore, LeClear & Robbins

J. J. Newberry, Schulte-United and Grant Store Fronts

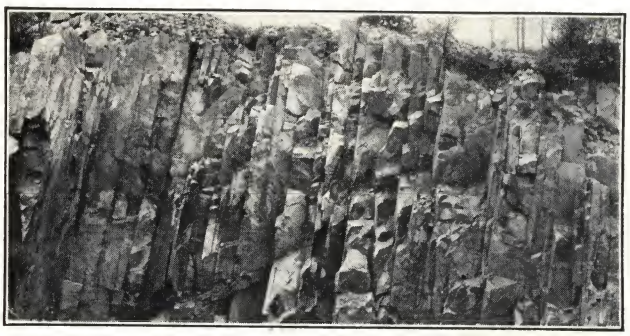
EASTERN QUARRIES, INC.

Specialists in Ashlar

742 Broad Street
EAST WEYMOUTH, MASS.

GRANITE ASHLAR AND FLAGGING

The accompanying photograph of a small section of one of our quarries shows a view of the end elevation of several seams and indicates the unusual geological structure. The seepage of vegetable and mineral solutions through these nearly vertical seams has produced a wide range of coloring on the face of the sheets ranging from light gray through tans, buffs, yellows and reds to dark brown and dull purple.



Seam Face Granite Ashlar

By using the natural face of the seam as the exposed face of the stone in the building we obtain our Seam Face Ashlar. This Seam Face Ashlar shows the full range of colors and the unusually interesting and varied texture of the natural seams. Geologists estimate that one hundred and fifty thousand years would be necessary to produce the effects shown in these seams. This makes it possible to obtain immediately on new construction the natural and permanent feeling of age that is peculiar to our material.

The seams in the quarry have not affected the strength of the granite.

Split Face Granite Ashlar

From the thicker sheets between seams we split off a Seam Face stone from each side of the sheet leaving a block of natural granite from the center which we then cut and finish to make our Split Face Ashlar using the Split Face as the exposed face in the building.

The texture of the Split Face is somewhat rougher than the Seam Face but is not as rough as rock face.

The range of color is not as wide as that obtained in Seam Face but the color often penetrates into the rock mass from the seams showing a variation of buffs and light tans and brown which we call sappy. Combining this sappy stone with the natural gray Split Face gives warmth and life to the material.

Uses of Granite Ashlar

Our Seam Face and Split Face Ashlar have been used for exterior or interior wall facing on churches, college groups, office buildings, libraries, residences, municipal buildings, schools, mausoleums and many other types of buildings, and is adaptable to any type of ashlar work. At times our stone is also used for parts of the trim, such as jambs, arches, sills, lintels, etc., but these members should be rather simple in detail as cut granite work is quite expensive.

Flagging

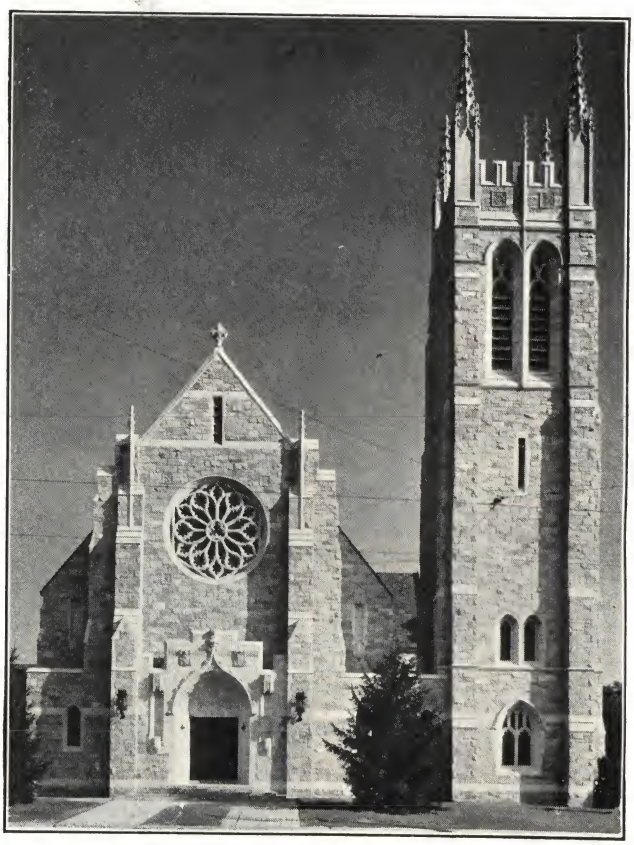
The thinner sheets from 1½ to 3½ in. in thickness are used for flagging and stepping stones. The surface is Seam Face and is smooth enough to be very satisfactory for flooring, either interior or exterior, and for garden walks or stepping stones. This flagging has the full range of color of Seam Face although the thinner sheets run generally to the lighter colors. At least 5 in. should be allowed for bed and flagging.

Specifications

Complete specifications and description of material may be found on third following page.

Cost

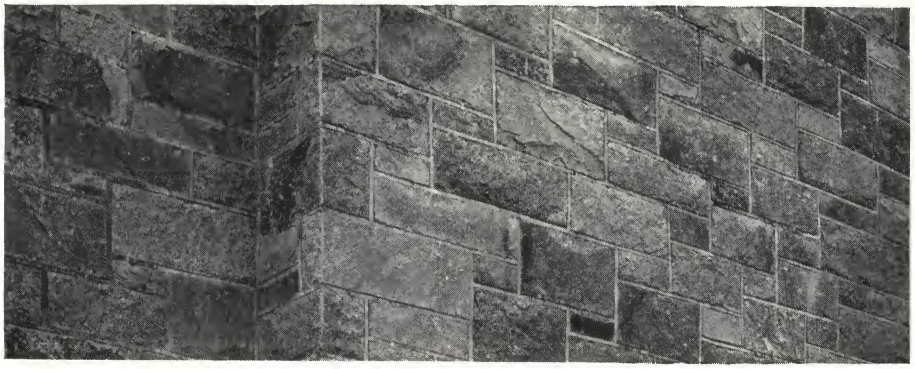
The seams in our quarries which produce the coloring of the material aid materially in the quarrying and cutting of the stone. Combining this natural advantage with our modern plant and quantity production, we are able to produce a granite ashlar the cost of which, set in the wall, competes favorably with local stone over a very wide area.



St. Theresa's Church, West Roxbury, Mass.
Maginnis & Walsh, Architects

No. 18 Half Seam and Half Split Face

Seam Face in full range of color eliminating dark reds and browns. Split Face in gray, sappy and mixed. Random ashlar, three-head and four-head work



No. 6 Seam Face Ashlar of a Rough Face with 15% Split Face

Replica of Harkness Memorial, Yale University. Interrupted course ashlar. James Gamble Rogers, Architect.

Colors: gray, tan, buff, dull purple, brown, yellow

No. 2 Seam Face Ashlar of a Very Smooth Surface

Three-head work with splay joints.

Colors: gray, tan, buff, dull purple, brown, yellow. Can be restricted if desired

No. 3 Coursed Ashlar with a Few Interruptions

A very wide range of color which may be restricted if desired

No. 5 Sappy Split Face Laid in Interrupted Course Ashlar

Of a true surface, no projections over 1 in.

Replica of St. Vincent Ferrer Church, New York, N. Y., Bertram G. Goodhue, Architect.

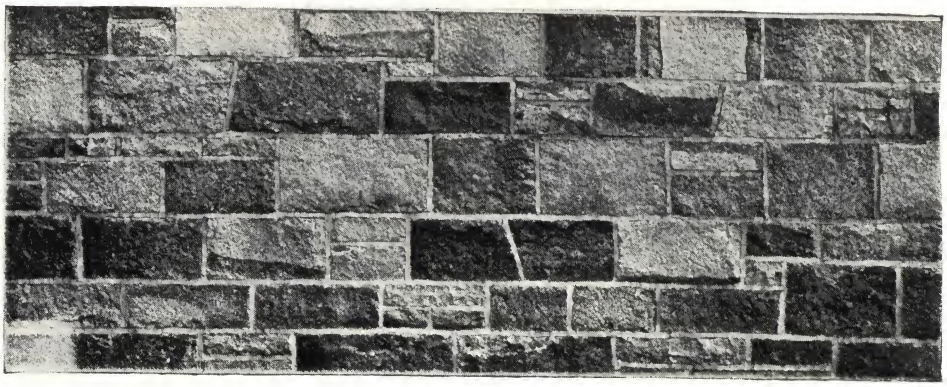
Colors: Several shades of brown

No. 7 Split Face Sappy, Gray and Sappy and Gray Mixed

Coursed with occasional interruptions. True split face, projections not over 1 in.

Replica of Church of the Sacred Heart, Jersey City, N. J., Cram & Ferguson, Architects.

Colors: gray and several shades of brown



Flagging

Exterior flagging in irregular shapes and random sizes. More formal effects for interior or exterior may be obtained with the flagging cut to rectangular shapes

A Few Buildings in Which Our Material Has Been Used

Building	Location	Architect
Harkness Memorial Quadrangle (Yale)	New Haven, Conn.	James Gamble Rogers
Municipal Building	Norwood, Mass.	Wm. G. Upham
Passionist Monastery and Church	Jamaica, L. I., N. Y.	Robert J. Reiley
First Swedish Lutheran Church	Brockton, Mass.	Charles C. Coveney
Sterling Library (Yale)	New Haven, Conn.	James Gamble Rogers
St. Mary's Church	Detroit, Mich.	Cram & Ferguson
Memorial Chapel	Bristol, Conn.	Perry & Bishop
Temple Ohabei Shalom	Brookline, Mass.	Blackall, Clapp & Whittemore
Apartment 1 University Place	New York, N. Y.	Emery Roth
Severence Hall (Wellesley)	Wellesley, Mass.	Day & Klauder
Vincent Astor Residence	Port Washington, L. I., N. Y.	Delano & Aldrich
Springwells High School	Detroit, Mich.	H. S. Keough
Town Hall	Redford, Mich.	Verner Vilheim & Molby
Passionist Monastery	West Springfield, Mass.	Comes, Perry & McMullens
Eighteenth Church of Christ, Scientist	Chicago, Ill.	C. W. Faulkner
Church of the Resurrection	Rye, N. Y.	Murphy & Lehman
Holy Rosary Cathedral	Toledo, Ohio	Comes, Perry & McMullens
St. Clare's Rectory	Cincinnati, Ohio	Crowe & Schulte
Hunter College	New York, N. Y.	Thompson, Holmes & Converse
Harkness Mausoleum	Woodlawn, N. Y.	James Gamble Rogers
Snyder Residence	Buffalo, N. Y.	Bley & Lyman
St. Paul's Church	Edgewood, R. I.	Ambrose Murphy
Bridge Southern States Parkway	Long Island	State Park Commission

Specifications

The following specifications are our standard and are intended to so describe the material that it will meet the requirements of ashlar work in general, either artistically, structurally or economically.

Changes in our standard sizes, limitations in color and changes in the manner of cutting can of course be made within reasonable limitations.

Ashlar—Roughly squared up as to rise and length to set to approximately ¾-in. joints, with beds, builds and joints cut with pitching tool.

Rises—5½ to 11½ in. with smaller stones for jinks if required.

Lengths—One and one-half times the rise or more.

Thickness—Random from 4 to 8 in., averaging 6 in.

Heads or Corners—Split or rough pointed with returns of 4½ to 8½ in. or more.

Reveals of Jambs, Lintels and Arches—Split or rough pointed and cut ½ in. less than actual reveal leaving joint for plumbing frame, etc.

Sills—Slip sills without lugs, seam face wash, split face rise.

Color and Texture—***Seam Face***—Color, quarry run or restricted; texture smooth, average or rough.

Split Face—Color gray, sappy and mixed; texture, projections up to 1 in.

Cutting

We seldom cut to a setting plan, as we have found from experience that, although pleasing effects as to distribution of sizes may be obtained, it is difficult to interpret color, and a more pleasing result as to both sizes and color is obtained by having the setters at the job interpret the architect's ideas.

Handling Material

Ours is a very tough close grained granite and is not easily chipped or broken. We have found that the stone may be dumped from a dump truck with little if any breakage and at a considerable saving in hauling cost. Special stones, such as sills, lintels, arches, etc., or any stone cut to plan should not be dumped. Nearly all of the stones are one-man stones and the largest can easily be lifted by two men.

Mortar

We have found the following to be a good setting mortar with our stone. One part cement to 3½ or 4 parts sand with lime equal to 15% to 20% of the volume of cement added. This mortar should be well mixed and wet enough to be plastic but not as wet as soft stone mortar, as the granite is practically non-absorptive. Joints should be well raked out and pointed with mortar of 1 cement to 2½ to 3 of sand and 5% to 10% lime. Non-staining cement is not necessary with our stone.

Joints

Our material is not a cut stone and is usually used as ashlar where a comparatively informal effect is desired. The joints should not be less than ½ in. and in general should be about ¾ in. with slight variations allowed.

Anchors

The variation in thickness of our material gives a good masonry bond if the setters are at all careful. In nearly every city our ashlar is considered as part of the bearing wall. In general anchors are not necessary.

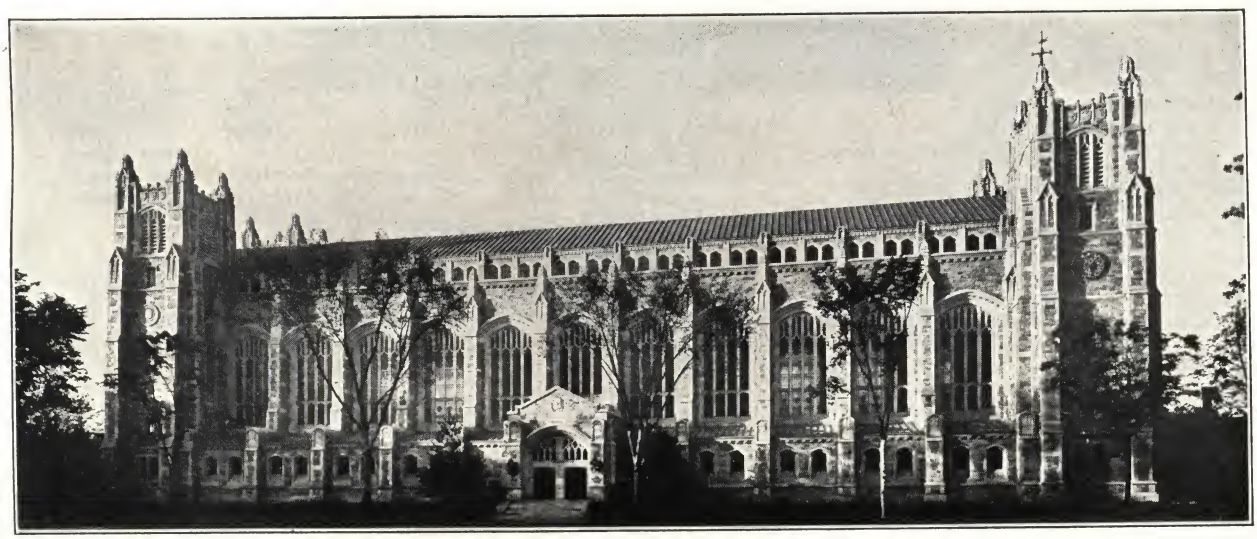
Setting

We have a construction department with a thoroughly competent organization for setting our material and the cut stone trim, and we will either quote on setting or give any help we can to contractors bidding on the setting.

Quality

This material is granite, admittedly the most lasting of all materials. The following is a brief summary of a report by Professor W. O. Crosby and Dr. G. F. McLoughlin of the Geological Department of the Massachusetts Institute of Technology:

The absorption ratio is remarkably low for the Seam Face and the fresh or white granite is virtually non-absorptive, making freezing tests wholly unnecessary. This granite is to a good degree proof against scaling or cracking on exposure to fire and is free from the kaolin spots, such as would cause pitting on exposure to weather. The parallel jointing does not tend in any slightest degree to make it shaly or impair its strength.



Legal Research Building, University of Michigan, Ann Arbor, Mich.
York & Sawyer, Architects

H. E. FLETCHER COMPANY

Producers of Granite

WEST CHELMSFORD, MASS.

Products

CHELMSFORD WHITE GRANITE.
CHELMSFORD GRAY GRANITE.
CHELMSFORD "BULFINCH" GRANITE.
MILFORD (N. H.) GRAY GRANITE.

DIMENSION, CUT, RUBBLE and CRUSHED GRANITE for buildings, bridges, roadways, sea-walls, docks and dams.

DIMENSION GRANITE, in carloads for mausoleum and monumental work.

PAVING BLOCKS, CURBING, SEWER INLETS and CRUSHED GRANITE for municipal work.

Chelmsford White Granite

A grayish-white granite which weathers well and is widely used for building and bridge work.

Chelmsford Gray Granite

A well-known standard light gray granite for building and memorial work. Weathers equally as well and is finer grained than Chelmsford White.

Both granites, when bush-hammered, are almost unequalled in retaining their light, almost white color.

Chelmsford "Bulfinch" Granite

A varied light grayish-buff colored granite used for many years in Colonial structures. A notable example is University Hall, of the Harvard University group at Cambridge, Mass., designed by Bulfinch and built in 1813. This famous building stands today, an example of the splendid weathering qualities of Chelmsford Granite. Chelmsford "Bulfinch" Granite has been used in recent additions to this group.

Paving Blocks and Curbing

We are one of the principal producers of paving blocks and curbing.

Facilities

Fifty years of quarry development have produced quarry faces containing millions of feet of granite available for quarrying under numerous derricks. With unexcelled railway facilities, and adequate cutting plant, this means that large contracts can be promptly executed.

We do no polishing work at this plant, but are in a position to furnish sawed slabs or saw blocks to polishing plants.

Organization and Service

Our organization has been built up of men having long experience in granite production and includes business, traffic and technical experts.

REFERENCES

BUILDING	LOCATION	ARCHITECT OR ENGINEER
New Jersey State Office Buildings	Trenton, N. J.	J. Osborne Hunt and Hugh A. Kelly
Pennsylvania State Capitol, West Approach, North Office Building, South Office Building No. 2	Harrisburg, Pa.	Gehron & Ross
The Sailors and Soldiers Memorial Bridge	Harrisburg, Pa.	Gehron & Ross and J. E. Grenier Co., Engineers
New York State Office Building, Park Work	Albany, N. Y.	State Architect Wm. E. Hougaard
Philadelphia-Camden Bridge	Philadelphia, Pa.	Paul P. Cret, and R. Modjeski, Engr.
Louisville-Jefferson Bridge	Louisville, Ky.	Paul P. Cret, Architect and Modjeski, Masters & Chase, Engrs.
Federal Reserve Bank	Baltimore, Md.	Parker Thomas & Rice
Federal Reserve Bank	Boston, Mass.	R. Clipston Sturgis
Ridge Road Bridge	Rochester, N. Y.	Gehron & Ross and Frank McKibben, Engr.
Hartford County Courthouse	Hartford, Conn.	Paul P. Cret and Smith & Bassette, Assoc.
New Orleans Post Office	New Orleans, La.	Supervising Architect of the Treasury
Thirty Columns in Facade, Treasury Building	Washington, D. C.	Supervising Architect of the Treasury
Lowell Post Office	Lowell, Mass.	Supervising Architect of the Treasury
Kansas City Post Office	Kansas City, Mo.	Supervising Architect of the Treasury
Fidelity Mutual Life Ins. Co., Building	Philadelphia, Pa.	Zantzinger, Borie & Medary
Wilkes-Barre Kingston Bridge	Wilkes-Barre, Pa.	Carrere & Hastings
Massachusetts State House Wings	Boston, Mass.	R. Clipston Sturgis
Lehman Hall, Harvard University	Cambridge, Mass.	Coolidge, Shepley, Bulfinch & Abbott
St. Louis Masonic Temple	St. Louis, Mo.	Eames & Young, Albert B. Groves, Assoc.
Metropolitan District Commission Building	Boston, Mass.	Densmore, LeClear & Robbins
Camden County Courthouse and Camden City Hall	Camden, N. J.	Edwards & Green
Olin Memorial Library	Middletown, Conn.	McKim, Meade & White
John W. Weeks Memorial Bridge	Cambridge, Mass.	McKim, Meade & White
Cottage Farm Bridge	Boston, Mass.	Desmond & Lord
Old First National Bank	Boston, Mass.	R. Clipston Sturgis
Shawmut National Bank Addition	Boston, Mass.	Parker, Thomas & Rice
Detroit Windsor Bridge	Detroit and Windsor	McClintic-Marshall Co., Engrs.
St. Peters Parochial School and Orphanage	Lowell, Mass.	Henry L. Rourke
Outerbridge, Crossing	New York, N. Y.	York & Sawyer, N. Y. Port Authority
Goethals Memorial Bridge	New York, N. Y.	York & Sawyer, N. Y. Port Authority
Kill Van Kull Bridge	New York, N. Y.	Cass Gilbert, Inc., N. Y. Port Authority
Holland Tunnel Ventilator Shafts	New York, N. Y.	New York & New Jersey Tunnel Commission

JOHN L. GOSS CORPORATION

Producers of "Goss Pink Deer Isle Granite"

QUARRIES AND HOME OFFICE

STONINGTON, MAINE

SALES OFFICE, 77 Summer Street, BOSTON, MASS.

SALES AGENTS

NEW YORK, N. Y., A. Le Poidevin & Co., Inc., 286 Fifth Avenue
LOS ANGELES, CAL., Bly Stone Co., 1985 E. 16th Street
PHILADELPHIA, PA., Frank Williamson, 2302 Spruce Street
SEATTLE, WASH., Clark H. Grunewald, 314 Eitel Building
MIDDLE WESTERN TERRITORY, Wm. H. Mitchell, 30 Church Street, NEW YORK, N. Y.

Product

Goss Pink Deer Isle Granite, for buildings, memorials and general construction, polished, hammered, pointed or rock-faced.

Service Available

Any responsible manufacturer or dealer can supply this material. The rough granite and sawed slabs are shipped to finishing plants all over the country, which are equipped to furnish all classes of work. A large number of plants carry stocks on hand, and the quarry always stands ready to supplement these with prompt shipments of any sizes, shapes or quantities.

We will be pleased to assist you in getting in touch with subcontractors in position to handle your particular project to best advantage, or to give preliminary estimates.

Facilities for Production

The natural advantages of the quarry site—a free working formation, so located that the product travels the short distance to our tidewater dock by gravity—have been developed with the best modern equipment; derricks, compressors, air tools, granite saws, etc., which are constantly being improved, replaced and kept up-to-date.

This makes it possible to give prompt deliveries on large or small orders, and to furnish monoliths of any size that may be desired. We ship by water directly from our quarry dock to seaport cities, or deliver to railroads at Rockland and Portland, Me.; Boston, Mass.; Philadelphia, Pa.; Wilmington, Del.

New York State Office Building, New York, N. Y.
Sullivan W. Jones, State Architect
Wm. E. Haugaard, Commissioner of Architecture
Goss Pink Deer Isle Granite, Manufactured by Grenci & Ellis, Inc., Peekskill, N. Y.

Color and Texture—Surface Finishes

Goss Pink Deer Isle Granite is a medium gray, colored with lavender pink feldspar. Polishing, which brings out the colors and develops an interesting pattern of crystals and markings, is recommended for base courses next to the sidewalk or where liable to become soiled. A rubbed or honed surface gives some of the same advantages but does not have the high gloss. For most general purposes and especially in connection with moulded members or carved details a hammered finish is advised. A pointed surface has an interesting but inexpensive finish with strong texture.

It is sometimes possible to obtain astonishing reductions in cost by using granite veneer with sawed finish, large plain surfaces and details laid out for the carborundum machine.

We will welcome opportunities to consult with designers who would like to accomplish this.

Compressive Strength

Tests in the laboratory of Massachusetts Institute of Technology give an average compressive strength of 32,250 pounds per square inch. This is well above all structural or code requirements.

Specifications

We suggest that you use the form recommended by the National Building Granite Quarries Association on another page of this book, inserting the finish desired, and in place of Section 2—"All granite shall be Goss Pink Deer Isle Granite from the quarry of John L. Goss Corporation at Stonington, Maine."

References

Building	Architect
Stevens Hotel, Chicago, Ill.	Holabird & Roche
Federal Reserve Bank, Boston, Mass.	R. Clipston Sturgis
Lafayette Building, Philadelphia, Pa.	John T. Windrim
Evans Memorial Galleries, Boston, Mass.	Guy Lowell
Insurance Co., of North America Building, Philadelphia, Pa.	Stewardson & Page
Neils Esperson Building, Houston, Tex.	Eberson & Eberson
Southern California Edison Building, Los Angeles, Cal.	Allison & Allison
Security Trust & Savings Bank, Los Angeles, Cal.	John Parkinson
Public Ledger Building, Philadelphia, Pa.	Horace Trumbauer
East Boston (Mass.) Savings Bank	Thomas James
Pilgrim Memorial Tower, Provincetown, Mass.	Willard T. Sears
South Office Building, State Capitol, Harrisburg, Pa.	Arnold W. Brunner
Merchants National Bank, New Bedford, Mass.	Adden & Parker
Industrial Trust Building, Providence, R. I.	Walker & Gillette
Security Building, Miami, Fla.	Robert Greenfield
New York State Office Building, Albany, N. Y.	Sullivan W. Jones
Salem Fields Entrance, Brooklyn, N. Y.	Percy W. Darbyshire
Fountain of Oceanus, Estate of John D. Rockefeller, Pocantico Hills, N. Y.	Welles Bosworth
Drexel Bank Building, Philadelphia, Pa.	Day & Klauder
Mutual Trust Co., Philadelphia, Pa.	Heacock & Hokanson and The Ballinger Co.
New York State Office Building, New York, N. Y.	{Sullivan W. Jones {William E. Haugaard
Fountain Memorial to Pilgrim Women, Plymouth, Mass.	McKim, Mead & White
Internal Revenue Building, Washington, D. C.	J. A. Wetmore
Pennsylvania R.R. Station, Philadelphia, Pa.	Graham, Anderson, Probst & White

GRANITE MANUFACTURERS ASSOCIATION OF MOUNT AIRY

MOUNT AIRY, N. C.

MEMBERS

J. D. SARGENT GRANITE COMPANY
Mount Airy, N. C.
Branch Offices:
40 Journal Square, Jersey City, N. J.
127 No. Dearborn Street, Chicago, Ill.
615 Witherspoon Building, Philadelphia, Pa.
207 Fulton Building, Pittsburgh, Pa.

NORTH STATE GRANITE COMPANY
Mount Airy, N. C.
Branch Office, 30 East 42nd Street, New York, N. Y.

THE NORTH CAROLINA GRANITE CORPORATION
Mount Airy, N. C.
Branch Offices:
40 Journal Square, Jersey City, N. J.
127 No. Dearborn Street, Chicago, Ill.
615 Witherspoon Building, Philadelphia, Pa.
207 Fulton Building, Pittsburgh, Pa.

MOUNT AIRY GRANITE CUTTING COMPANY
Mount Airy, N. C.

Products

DIMENSION GRANITE for Buildings, Mausoleums, Monuments, Bridges, Dry Docks, etc.

POLISHED and TURNED GRANITE.

GRANITE PAVING BLOCKS, STREET CURBING, CROSSWALK, RUBBLE ASHLAR, BUILDING BLOCKS, CRUSHED GRANITE and RIP RAP.

The Association and Its Object

The aim of this Association is to promote the use of Mount Airy Granite for all purposes. Its members are prepared to co-operate with architects, engineers and builders in matters relating to the use of granite, samples, specifications, estimates, etc.

Quarry Production

The quarries were first opened in 1889. The output has steadily increased until a maximum of 3500 carloads in one year has been reached.

Owing to natural advantages peculiar to Mount Airy quarries, Dimension Stone of unusual size is easily obtained, only limit being that of railway transportation.

Facilities

Cutting plants and offices are strategically located at the base of the Mount Airy Quarries. Equipment is modern and complete. Electric traveling cranes, polishing machinery and turning lathes, sandblast and carborundum machines, gang saws, compressed air driven tools of all kinds; this equipment, together with the unlimited supply of rough granite available, enables large contracts to be executed in quick time.

Geographical Location

The Mount Airy quarries are well situated in reference to shipping, being about an equal distance from New York, New Orleans and Chicago; which fact guarantees a reasonable transportation cost to points throughout the East, South and Middle West. Nearby connections with the Southern and Norfolk & Western Railways serve the quarries.

Colors and Texture of Mount Airy Granite

Mount Airy granite, *"The Granite of Individuality,"* is a very light gray, almost white, biotite granite of medium texture. Feldspar, quartz and mica characterize the granite megascopically.

The feldspar is nearly white, while the quartz is a blue gray and the mica black and very evenly distributed, giving an appearance of decided strong character.

The following Chemical Analysis and tests are significant:

SiO_2	70.70
Al_2O_3	16.50
Fe_2O_3	2.34
MgO	0.29
CaO	2.96
Na_2O	4.56
K_2O	2.45
FeS_2	0.09
Total	99.89
Weight per cu. ft	165 lbs.
Water absorbed per cu. ft	0.33 lb.
Crushing strength	23,068 lbs. per sq. in.

From Bulletin No. 2, page 155, North Carolina Geological Survey, "The building and ornamental stones of North Carolina." JOSEPH HYDE PRATT, State Geologist.

Estimates and Samples

A complete organization is maintained by each member of this Association for furnishing estimates, setting plans, details, etc., promptly and efficiently.

Preliminary estimates cheerfully furnished without obligations on request of architects or contractors.

Samples of Mount Airy Granite will be furnished on request, and advice as to grade or style of finish desired.

A Panoramic View of the Famous Mount Airy Granite Quarry of The North Carolina Granite Corp'n
There are over 75 acres of exposed granite in the working area

Granite for Every Purpose

Cut, carved, and polished granite for all purposes is the principal product of this Association.

In addition, several hundred thousand feet of street curbing, a million or more paving blocks, thousands of tons of crushed granite and rip rap are produced every year.

A specially prepared rubble for broken range ashlar has won great favor with architects, contractors, and owners.

New types of building blocks are being developed with very pleasing results.

Whatever type of granite product is required this Association, through one or more of its members, can assure complete satisfaction.

Buildings

Good practice requires the use of some granite in every fine building. Whether the granite be limited to base course or includes the entire superstructure, this organization will give the same attention to details and first class workmanship.

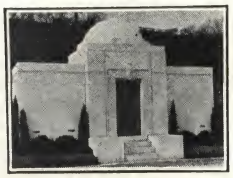
The prompt delivery of accurately cut granite saves time and money on any building job.

References

Union Trust Building, Washington, D. C.
Guilford County Courthouse, Greensboro, N. C.
Citizens National Bank, Long Branch, N. J.

Mausoleums

The dignity and beauty of the modern private mausoleum are best secured through simplicity of design enriched by a granite of strong character in appearance. Monolithic wall and roof stones are preferred from a structural standpoint.



The fact that Mount Airy Granite has been used in the construction of more private mausoleums than any other American granite is striking recognition of its superior qualities.

References

Private Mausoleums

The Sauer Mausoleum, Richmond, Va.
O'Brien Mausoleum, Cincinnati, Ohio
Dodge Mausoleum, Detroit, Mich.

Public Mausoleums

Rose Hill Mausoleum, Chicago, Ill.
Valhalla Mausoleum, St. Louis, Mo.

Monuments

Mount Airy Granite is particularly well suited to heavier type monuments. Stock of uniform texture free from defects is always available in sizes up to the limits of transportation. It is especially adapted to fine moulding, carving, and sculpture work. Superior equipment and craftsmanship have also been important factors in winning for Mount Airy a position of leadership in the heavier type monument field.

References

Higgins Monument, Chicago, Ill.
Patterson Monument, Dayton, Ohio
Acacia Park Monument, Buffalo, N. Y.
Pennsylvania Monument, Gettysburg, Pa.

Bridges

Bridge construction requires a granite with structural strength. Mount Airy has that strength and, in addition, is lastingly beautiful. It lends itself equally well to massive piers and graceful arches. Plant and quarry capacity have been important factors in enabling unusually large bridge contracts to be completed in record time.

References

Arlington Memorial Bridge, Washington, D. C.
Fall Creek Bridge, Indianapolis, Ind.
Delaware River Bridge, Philadelphia, Pa.

Rock Face Broken Range Ashlar

Mount Airy 1 & 2 Man Rubble is granite broken out in neat rectangular shapes and is intended to be used in broken range ashlar masonry work. Prominent architects have specified it in building after building; mason contractors prefer it because it can be put in the wall with remarkable economy; owners are enthusiastic about its appearance.

Write for a copy of the folio describing this interesting material and containing model specifications and other valuable information about broken range ashlar.

References

St. Charles Borromeo Seminary, Overbrook, Pa.
Bethesda M. E. Church, Salisbury, Md.
First United Evangelical Church, Williamsport, Pa.
Rectory of Holy Child, R. C. Church, Philadelphia, Pa.
Residence Dr. C. W. Banner, Greensboro, N. C.

A Continuation of the Panoramic View

The cutting plant appearing in the foreground has a floor space of 33,000 sq. ft. The combined floor space of Association plants is in excess of 75,000 sq. ft.

ESTABLISHED 1826

GRANITE RAILWAY COMPANY

Quarriers of Granite Railway Syenite

1245 Hancock Street, QUINCY, MASS.

The Company

In 1826 the GRANITE RAILWAY COMPANY was organized and chartered by the Commonwealth of Massachusetts, for the dual purpose of quarrying stone and transporting it by railway to the Neponset River, whence it was taken by vessels to all parts of the Atlantic coast from Maine to Louisiana. The railway which was built in 1826 was *"The First Railway in America."* For a half century the Company operated both its quarries and railway, then it gave up its railway and devoted its entire energies to the quarrying side of the business.

Syenite

Railway granite is really a syenite composed of quartz, feldspar and hornblende and takes it name from Syene in upper Egypt where the similar stone so extensively used by the ancient Egyptians was quarried. The hornblende makes it very hard and durable. Even after a hundred years of such a variable climate as is found in New England, Railway Syenite fails to show the slightest trace of disintegration. Two good examples are Bunker Hill Monument and Minot's Ledge Light.

Syenite from GRANITE RAILWAY COMPANY'S quarries is taken from strata far below the surface of the ground. Every block is closely examined, and any not perfect in color and texture is discarded. Two standard shades of color, dark and extra dark, give the architect a choice permitting considerable flexibility in chromatic design.

The Quincy syenite first used in buildings was selected for its hardness and its permanence. While stone polishing is one of the oldest arts, the methods were at first rough and crude, making the cost of polishing too great to permit of the use of large polished surfaces in building construction. It was early recognized, however, that Quincy syenite when polished presents a uniquely beautiful surface, unusually dark in color, yet with far more lively a sparkle than is ordinarily associated with so dark a material. The beauty of this polished surface, together with the contrasting gray of the hammer-finished stone, led gradually to a larger and larger part of the output of the Quincy syenite being used by monument manufacturers.

In recent years changing conditions once more offer an opportunity to the architect to obtain new distinction of design by the use of this same Granite Railway stone which was so widely used for structural purposes generations ago. Not only does the modern steel-framed building permit the use of much thinner veneers than was feasible in the days when masonry walls were all bearing walls, but also methods and machinery for polishing stone have so improved that it is now possible to polish large surfaces of granite at greatly reduced cost.

At the same time, saws have been devised which enable granite manufacturers to cut solid blocks into veneers of almost any thickness. Owing to its hardness and strength, and ease with which it can be cleaned by simple washing, polished Granite Railway syenite is especially adapted as a facing on lower stories of buildings that are subject to the dirt of the streets and likely to be chipped by the wear and tear of passing traffic.

The beautiful dark color of its polished surface contrasts well with lighter stone in upper stories. As the setting for windows and doorways, for bronze and iron grille work, for marble carving or panels, polished Granite Railway syenite provides a background which brings out the contrasting detail subordinating its own intrinsic beauty.

Service to Architects

The GRANITE RAILWAY COMPANY desires to place its skill and knowledge of the possibilities of syenite granite at the service of the architect and contractor. It welcomes, therefore, inquiries about the use of granite in any way.

The knowledge of the various applications of syenite possessed by this company enables it to suggest economical and efficient new ways of using its granite both in the ashlar and in the massive block.

In fact, new uses for the employment of syenite granite are constantly being developed.

The Parker House, Boston, Mass.

Recent Buildings

Some excellent examples of the use of Granite Railway syenite in modern building construction may be seen in the Parker House and the New England Telephone Building, Boston, Mass.; the Philadelphia Savings Fund Society Building, 1200 Market St., Philadelphia, Pa.; the Natl. Mt. Wollaston Bank, Quincy, Mass.; the Palmer House, Chicago, Ill.

Bunker Hill Monument, Boston, Mass.
Erected by Granite Railway Co. Height 221 ft.
Construction started 1826

Showing Gateway to the Quarry, and on the Left, Part of the Original First Railway in America

Photo by W. A. Bradford

Minot's Ledge Light, Boston Harbor
Built 1855-60 with Railway Granite

ESTABLISHED 1845

HARRISON GRANITE COMPANY, INC.

TELEPHONE
MUrray Hill 2-2477

MAIN OFFICE AND STUDIOS
4 East 43rd Street, NEW YORK, N. Y.

BRANCH OFFICES
CHICAGO, ILL., 809 Fine Arts Building
DETROIT, MICH., 18090 Indiana Avenue
MINNEAPOLIS, MINN., 3529 Hennepin Avenue
PITTSBURGH, PA., 6663 Aylesboro Avenue

WORKS, BARRE, VT.

Products

MEMORIALS of all kinds in GRANITE, MARBLE and BRONZE, ranging from monumental pieces of public interest to the simplest of private tributes.

Mortuary Art

Individual tastes are as diversified as the art itself but, whether the desired effect is dignified elegance or impressive simplicity, we are truly prepared to serve the best interests of our clients in an efficient and able manner.

Construction and Erection Facilities

Eighty-six years of "knowing how," careful personal supervision, and our complete and extensive cutting facilities enable us to set and maintain a high standard of workmanship and design.

The Harrison plant is electrically equipped and contains all the modern tools and appliances necessary to the production of well-finished, artistic monuments.

Our erection facilities are of the best and this work is entrusted only to those who have demonstrated their ability to grasp and execute the lofty concept of the architect who designed the memorial they are to build.

Design and Architectural Departments

Wide experience in our field has fitted us to offer design suggestions, sketch studies, etc., and we are glad to co-operate with the architect by placing the facilities of these departments at his disposal.

Partial List of References

New York, N. Y.

Trowbridge & Livingston
Carrere & Hastings
Alfred C. Bossom
C. P. H. Gilbert
John V. Van Pelt
Hobart Upjohn
McKim, Mead & White
Frank A. Moore
J. Robertson Ward
H. Van Buren Magonigle
Wm. Lawrence Bottomley
T. E. Blake
Eugene Schoen

Miscellaneous Cities

Albert Kahn, Detroit, Mich.
H. Hornbostel, Pittsburgh, Pa.
Talmadge & Watson, Chicago, Ill.

Mausoleum for Richard T. Crane, Graceland Cemetery, Chicago, Ill.
JOHN RUSSELL POPE, Architect

S. HASKEL & SONS, INC.

Producers of "Shastone" Special Granites

OFFICE AND PLANT

97-115 Harrison Place and 96-114 Ingraham Street

BROOKLYN, N. Y.

QUARRIES AND PLANTS AT EASTON, PA. and MILFORD, MASS.

Products

"SHASTONE" GRANITES for exterior building work, memorials, mausoleums and monuments; FOREIGN SCANDINAVIAN GRANITES, GIBRALTAR BLACK GRANITE and PINK GRANITE of Milford Quarries a specialty. CUTTING, SHAPING and POLISHING.

"Shastone"

The world's selected granites, foreign or domestic, possessing the finest qualities that make them adaptable for the highest grade of monumental and architectural purposes.

"Shastone" polished granites are specially recommended for all exterior decorative work and memorials which are subject to dust and dirt. The trade-mark shown is a guarantee of quality and genuineness.

Polishing

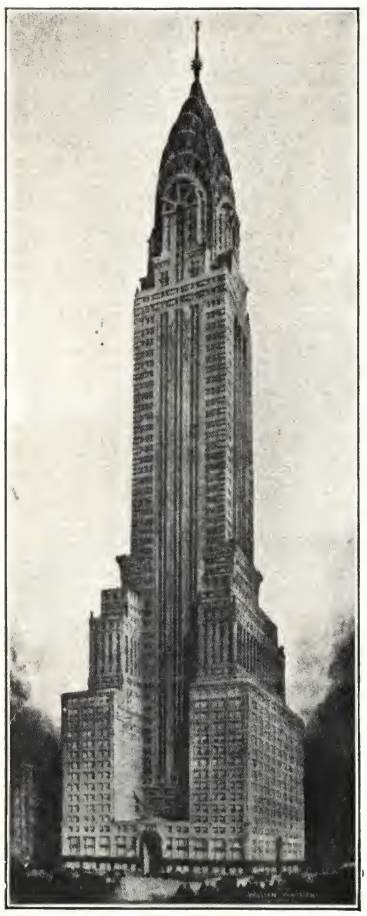
"Polish Expresses the Beauty of Granite."

It is the genuine polished surface of granite that is the effective means of preservation and preventive of surface deterioration against the action of the elements and staining from dust and dirt.

"Shastone" Polishing Plant—Our cutting and polishing plants are among the largest in the world. They are equipped with every imaginable device for the production of a high class finish.

Colored Granites

We carry in stock both foreign and domestic granites of a large variety of colors, black and pink especially. Samples, details and prices on request.



Chrysler Building, New York, N. Y.
WILLIAM VAN ALEN, Architect
Granite used is "Shastone" Emerald Pearl

Transportation Facilities

Location of our quarries and finishing plants near rail and water centers make it convenient to quickly transport our products to any part of the country.

Recent Installations and Their Architects

Integrity Trust Building, Philadelphia, Pa., Samuel M. Green and A. H. Lavalle
Grant Building, Pittsburgh, Pa., Henry Hornbostel
Worth Stores, New York, N. Y., Emery Roth
Bricken Casino, New York, N. Y., Ely Jaques Kahn
38th St. and Broadway Building, New York, N. Y., Ely Jaques Kahn
Faidley Building, Omaha, Neb., J. & A. McDonald
Banks Huntley Building, Los Angeles, Cal., John & Donald Parkinson
29 Broadway Building, New York, N. Y., Sloan & Robertson
Judah Building, Chicago, Ill., Holabird & Root
Fuller Tower, New York, N. Y., Walker & Gillette
Stewart & Co., New York, N. Y., Warren & Wetmore
United States Savings Bank, Newark, N. J., Guilbert & Betelle
Title Guarantee & Trust Co., New York, N. Y., John Mead Howells
Goldman Sachs Building, New York, N. Y., A. F. Gilbert
Wellington Hotel, New York, N. Y., Robert T. Lyons, Inc.
Seaboard National Bank, New York, N. Y., Walker & Gillette
Women's Athletic Club, Chicago, Ill., P. B. Maher
Dayton Women's Apparel Stores, Dayton, Ohio, Hugo V. Miller
James McCreery Stores, New York, N. Y., Starrett & Van Vleck
Buffalo State Office Bldg., Buffalo, N. Y., State Dept. of Architecture
N. J. Law School, Jersey City, N. J., J. B. Wertz
I. J. Fox Store, New York, N. Y., Elias Rothschild
Warner Brothers Studio, New York, N. Y., Frank S. Parker
Astor Apartment, New York, N. Y., Charles A. Platt

Empire State Building, New York, N. Y.
SHREVE, LAMB and HARMON, Architects
Granite used is "Shastone" Black

NEW ENGLAND GRANITE WORKS, INC.

WESTERLY, R. I.

BRANCH OFFICE: Room 501, 12 East 41st Street, NEW YORK, N. Y.

REPRESENTATIVES

PITTSBURGH, PA., Jay R. Wells, 501 Keystone Building

DETROIT, MICH., W. A. Munger, 1416 St. Clair Avenue

PHILADELPHIA, PA., Edward A. Jefery, 34 So. 16th Street

Product

WESTERLY GRANITE in several distinct colors for the highest grade of permanent construction including:

Building Work of distinctive or Monumental Character; Mausoleums of any size; Public and Private Memorials in which quality of material and workmanship are paramount.

Westerly Granite

White Westerly Granite—A creamy white in the hammered finishes and a buff gray when polished. It is a fine grained granite adapted to the finest finishes and carved work and yet readily available in quantity and sizes so that it can be used on the larger class of work. It is very uniform in color and character. As monoliths can be produced to the limits of transportation it is especially recommended for mausoleum work where large roof stones and other members are required. The polished finish brings out a delicate buff gray color which harmonizes very satisfactorily with limestone superstructures. It has been notably so used on the Greater Penobscot Building and the St. Aloysius Church, both in Detroit.

Photograph by Samuel H. Gottscho

Fountain of Light Pink Westerly Granite, R. B. Mellon Estate, Pittsburgh, Pa.
FERRUCCIO VITALE, ALFRED GEIFFERT, JR., Landscape Architects

Red Westerly Granite—Of a medium grain and of a deep pink shade. It is adapted for building work, mausoleums and memorials where a colored granite is desired. If used in the variegated shades it is especially economical.

Blue Westerly Granite—A blue-white color and fine grain. It is of the very best quality, noted for its permanence of color and its adaptability to the finest workmanship. It is therefore used almost exclusively for the best type of memorial work.

Pink Westerly Granite—In both the light and dark shades, it is acknowledged one of the finest granites in the world. It is of a delicate pink shade and extremely fine grain and very hard. It can be finished with the delicacy of marble and yet has the permanence of the best of all granites. It is used for the most refined memorial work.

Facilities

All shades of Westerly Granite are produced from our own quarries at Westerly, R. I., which have been developed and expanded so as to make them all readily obtainable for their respective classes of work. Our finishing plant is equipped with all types of modern machinery and skilled workmen are available for all classes of work. Direct rail connection with the New Haven Railroad allows prompt handling of all shipments.

We are prepared to erect mausoleum and memorial work with our own men and equipment and thus furnish complete supervision and assume complete responsibility.

Organization

Our representatives are willing to assist architects at any time in the preparation of specifications or in the discussion of the details of construction for building work.

We have specialized in the design of mausoleums and memorials and are prepared to submit sketches, discuss construction or otherwise assist architects, sculptors or contractors with this type of work.

References

Travelers Insurance Building, Hartford, Conn., Donn Barber, Architect. Red Westerly Granite for entire exterior.

Colonial Trust Company, Pittsburgh, Pa., F. J. Osterling, Architect. Red Westerly Granite for two street fronts.

Greater Penobscot Building, Detroit, Mich., Smith, Hinchman & Grylls, Architects. Polished White Westerly Granite for first story.

St. Aloysius Church, Detroit, Mich., Donaldson & Meier, Architects. Polished White Westerly Granite for base and entrance pilasters.

Charter Oak Memorial Tablet, Travelers Building, Hartford, Conn., R. H. Dana, Architect. Honed Light Pink Westerly Granite.

McLachlan Mausoleum, Cleveland, Ohio, Abram Garfield, Architect. Light Pink Westerly Granite.

Hardy Mausoleum, Flushing, L. I., N. Y., W. G. Mercer, Architect. Blue Westerly Granite.

Marrott Mausoleum, Indianapolis, Ind., A. H. Fehmer, Architect. Blue Westerly Granite.

Independence Memorial, Boston Common, Boston, Mass., John F. Paramino, Sculptor. Honed Light Pink Westerly Granite.

Hartford National Bank & Trust Company, Hartford, Conn., Dennison & Hirons, Architects. Blue Westerly Granite for rebuilding two stories of six-story building of the same granite built fifty years previously.

OLSON GRANITE COMPANY

CONCORD, N. H.

NEW YORK AND GENERAL EASTERN REPRESENTATIVE: P. L. Spier, 2 East 45th Street, New York, N. Y.—Telephone, MOhawk 4-1844
BOSTON AND VICINITY: W. B. Esselen, 80 Boylston Street, Boston, Mass.—Telephone, HANcock 2686

GRANITE FOR BUILDING AND MEMORIAL WORK

Varieties

Olson Granite is available in rough stock, sawed, hammered, polished or carved surfaces. All standard varieties of granite cut to order.

Quality

Concord Granite, used since Colonial days for public buildings in New England, and subsequently throughout the United States, has stood the test of time with surfaces practically unaffected by severe weathering.

Olson Concord Granite is fine to medium grained, grayish in color and of high compressive strength.

Olson Pink Granite offers warmth and brilliancy in the mass. It is a rich blend of coral pink with lighter pearls, flecked with black crystalline formations. Axed or polished, it is highly resistive to the elements.

Plant and Facilities

Olson shops, equipped with modern production machinery, are located adjacent to the quarries, in a district where skilled union granite cutters are always available. Intricate carving by hand is also given special attention.

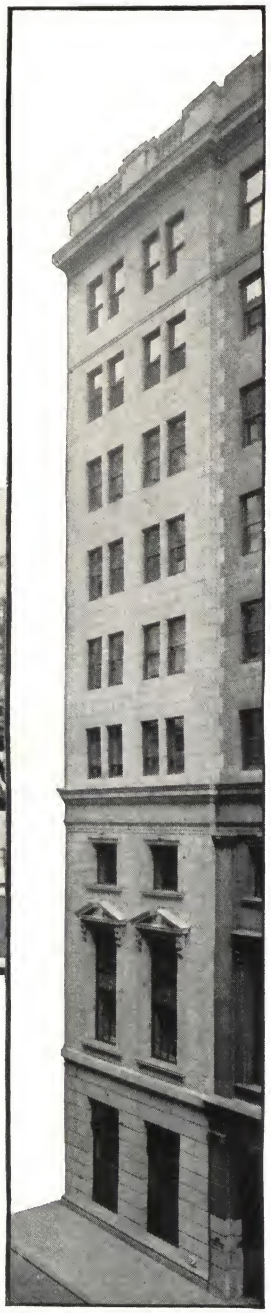
Location

Suitable for prompt delivery throughout the Central Eastern States. Shipments direct from the Olson siding connect with trunk line freight movements scheduled for delivery in New York the second following morning.

Estimates

Address all requests for estimates to P. L. Spier, 2 East 45th Street, New York, N. Y. A representative will call at any point in the East on request. Estimates will be furnished without delay.

Liberty Bridge, Pittsburgh, Pa.
STANLEY L. ROUSH, Architect
Olson Granite used for the pylons. Elaborate carvings and mouldings executed by Olson to specification before delivery



Lee Higginson Building (Addition), Boston, Mass.
COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, Architects
The granite features in structure include heavy cornice and balustrade, with fine mouldings; large scale mouldings of jambs and sills; heavy pediments with carved brackets

A Few Representative Buildings and Their Architects

This material is featured in scores of public and private buildings under representative architects. In addition to the partial list below, we have supplied numerous United States Post Offices, New York City Public Schools and various State institutions.

BUILDING	ARCHITECT
Havemeyer Telephone Bldg. (Addition), New York, N. Y.	Voorhees, Gmelin & Walker
Claremont National Bank, Claremont, N. H.	Hutchins & French
George F. Baker High School, Tuxedo Park, N. Y.	Guilbert & Betelle
Mamaroneck Junior High School, Mamaroneck, N. Y.	Knappe & Morris
Kennett Consolidated School, Kennett Square, Pa.	E. William Martin
Club House, Society of Colonial Dames, New York, N. Y.	R. H. Dana, Jr.
Central Building, Far Rockaway, N. Y.	William L. Rouse
Bronx Savings Bank, Westchester Square, New York, N. Y.	Morgan French & Co.
Mother Cabrini High School, New York, N. Y.	Rudolph Meier
Westchester County Jail, North Tarrytown, N. Y.	Morris & O'Connor
Library, Teachers College, Shippensburg, Pa.	Tilden Register & Pepper
John Adams High School, Woodhaven, N. Y.	Wm. C. Martin
Abraham Lincoln High School, Brooklyn, N. Y.	Wm. C. Martin
St. Genevieves Roman Catholic Church, El Mora, N. J.	Neil J. Convery
Dormitories A and B, Rensselaer Polytechnic Institute, Troy, N. Y.	Joseph M. Lawlor
Municipal Building, Glen Ridge, N. J.	W. O. Bartlett
St. Agnes Hospital, White Plains, N. Y.	Frank J. Murphy
Fourth Church of Christ, Scientist, New York, N. Y.	Cherry & Matz
St. Justins Church, Hartford, Conn.	Whiton & McMahon
Penn Wynne School, Ardmore, Pa.	Ralph E. White

ESTABLISHED 1874

PERRY BROS. GRANITE CO.

Designers, Quarry Operators and Cutters of Concord Granite

CONCORD, N. H.

BOSTON, MASS. CINCINNATI, OHIO CLEVELAND, OHIO PHILADELPHIA, PA. WASHINGTON, D. C.

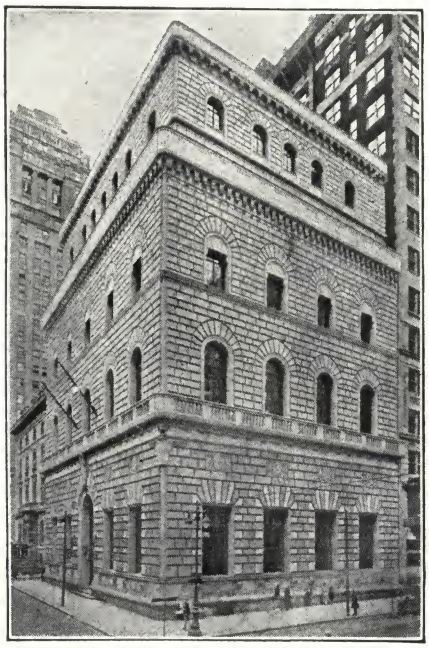
Concord Granite—For Permanent Structures of Artistic Merit and Imposing Design

Concord Granite is a holocrystalline, granular rock composed of quartz, a potash feldspar and muscovite-biotite (potassium and magnesium iron mica). Very small feldspar crystals produce a granite of very fine grain. Color is blue gray, the shade determined by feldspars in quarry. Because of its very fine grain and especially high quality, Concord Granite is primarily used for such buildings as memorials, public buildings, mausoleums and other structures of a permanent character.

The Perry cutting plant, one of the largest and best equipped in the United States, located near our quarries at Concord, N. H., enables us to turn out large quantities of polished, dressed and rough granite in a comparatively short time. Location on Boston & Maine R.R. with connections with Boston & Albany R.R., Central Vermont R.R. and New York, New Haven & Hartford R.R. makes possible the shipping of our granite to any part of the United States.

Advice on Proposed Work

Unnecessary expense may be avoided by considering finish of stone for different parts of building and adaptability of design to cutting methods generally employed, depending on location and exposure of granite to smoke and dirt, and its position as regards visibility to the public eye. The advice of our designers, also estimates and samples, gladly furnished.



Installation of Goss Pink Deer Isle Granite, at Philadelphia, Pa., Manufactured by Perry Bros.

Above:

Installation of Gray Concord Granite, at Wilkes-Barre, Pa., Quarried and Manufactured by Perry Bros.

Above:

Installation of Goss Pink Deer Isle Granite, at Dover, N. H., Manufactured by Perry Bros.

Installation of Gray Concord Granite, at White Plains, N. Y., Quarried and Manufactured by Perry Bros.

Partial List of References

Philadelphia, Pa.

Abbott's Alderney Dairies, Inc.
Oak Lane Trust Company
Lancaster Avenue Title & Trust Company
Fleischmann Building
Belmont Trust Company Bank Building
Atwater Kent Manufacturing Company Building No. 1
Rittenhouse Plaza Apartments
Shriners Hospital for Crippled Children
Broad Street National Bank
Bell Telephone Building, 19th and Arch Streets
Boy's Catholic High School
Curb for Scottish Rite Temple
Apartment Hotel, 17th and Locust Streets
Restaurant and Office Building, 16th and Chestnut Streets
Drexel & Co. Bank Building, 15th and Walnut Streets
Beth El Sisterhood Building
Lawyers Building
Sacred Heart Parish School
Funfield Recreation Center Building

Philadelphia, Pa. (Continued)

William Penn Title & Trust Company
Forrest Theater

Boston, Mass.

Theodore Roosevelt School
Prince District School
Washington-Allston School
Curb for Boston Chamber of Commerce Building
Police Station, Division No. 2
Health Unit Building
Pilgrim Court Apartments
Police and Fire Station
School Street Trust Company
Boston Museum of Fine Arts, Western Art Wing
B. P. O. Elks' Building
George Robert White Health Unit Building No. 7
Consolidated Gas Company
Goodyear Tire & Rubber Company
Nurses Home, Boston City Hospital
Roxbury High School for Boys, Roxbury, Mass.

New York, N. Y.

Public Schools Nos. 117, 60, 100, 36, 47, 52, 107, 99, 108, 205, 116, 125, 215, 212, 180, 97, 216, 217
James Monroe High School
James Madison High School
High School of Commerce
Mother A. M. E. Zion Church
Hamilton Avenue Sewer
Bank Building, 21st Avenue and 86th Street
Flatlands Avenue Sewer
95th Street Apartment House
Fort Hamilton Parkway and 60th Street Sewer
Bay Ridge Savings Bank Building

Detroit, Mich.

Calvert Lithographing Company
Ralsar Apartments
National Bank of Commerce
Detroit Life Insurance Building
R. L. Polk Building
Smith-Bridgeman Store Building
St. Catherine's High School and Auditorium
First State Bank

PLYMOUTH QUARRIES INCORPORATED

Specialists in Ashlar

Savings Bank Building
EAST WEYMOUTH, MASS.

SHIPPING POINT: EAST WEYMOUTH, MASS.

SEAM FACE ASHLAR, SPLIT FACE ASHLAR, SEAM FACE FLAGGING

Ashlar and Flagging

Our ashlar and flagging are produced from a tough close grained granite having the usual properties of strength and durability. Our ashlar also has a wide range of natural coloring peculiar to our quarries.

Some unusual geological disturbance about one hundred and fifty thousand years ago divided the rock mass of these quarries into sheets varying from a few inches to 3 or 4 ft. in thickness with the seams between sheets nearly vertical.

Since that time the surface waters, carrying solutions of vegetable and mineral matters have found their way down through these seams, with the result that the faces of the seams now show a wide range of natural colors varying from gray and green through light yellows, tans and buffs to dark red and brown.

Seam Face

Using the faces of these seams as the exposed face of the finished stone in the wall gives the name of Seam Face to this material. This Seam Face Ashlar may show the full range of color or the range may be selected as to general color effects desired.

The Seam Face Ashlar also has an interesting natural texture ranging from smooth to a rough and rippled surface.

Split Face

From the thicker sheets of stone, after Seam Face stones have been split from each side of the sheet, the center of the block is split and cut into our Split Face Ashlar. The texture of Split Face is somewhat rougher than Seam Face but is not a rough face texture. The maximum projection of our Split Face would be about 1 in.

The color range of Split Face is not so wide as Seam Face but the natural gray mixed with the several shades of light buff, tan and brown which are available in the Split Face gives a very interesting color range.

Varying effects as to color and texture may be obtained by combining Seam Face with Split Face.

Flagging

The thinner sheets up to four inches in thickness are used for flagging, steps or stepping stones. The fairly smooth texture and the range of color make this an ideal material for terraces, courts, garden walks and other landscape features.

Standard Ashlar

Our standard practice is to square the ashlar to rise and length with pitching tool. This ashlar is ready to set to approximately ¾-in. joints being intended for more or less informal work. The rises range from 4 to 13 ins. and the lengths are random, generally from one and one-half times the rise to twice the rise with some longer. The thickness is random from 4 to 8 ins. averaging 6 ins. Returns of corners are split or rough pointed.

We will make suggestions as to methods of setting, recommendations as to mortar, etc., or will answer any questions in regard to the material.

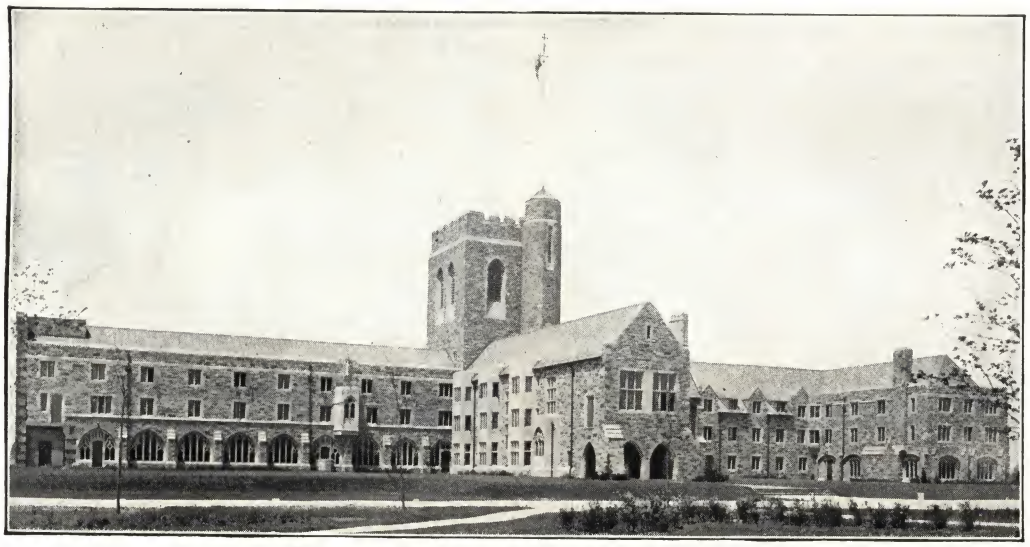
Cost

The seams which produce the unusual coloring also lend an advantage in the quarrying and cutting of the ashlar and we can compete favorably with softer local stones considering material alone or cost set in place.

Church of Saint Philip Neri, Chicago, Ill.
J. W. McCarthy, Architect

Zion Lutheran Church, Bay City, Mich.
W. E. N. Hunter, Architect

St. Paul's Church, Norwalk, Conn.
P. L. Fowler Co., Architects



College of Dominican Fathers, River Forest, Ill.
W. E. Anthony, Architect

Material from Plymouth Quarries Was Used on These Buildings

Building	Location	Architect
Lawyer's Club and Dormitory	Ann Arbor, Mich.	York & Sawyer
Second Presbyterian Church	Washington, Pa.	Nicklas & Roderick
St. Paul's Church	Winston-Salem, N. C.	Cram & Ferguson
Instruction Unit No. 1 Hunter College	New York, N. Y.	Thompson, Holmes & Converse
Briggs Cunningham Residence	Greens Farms, Conn.	Vischer & Burley
Trinity Evangelical Lutheran Church	Detroit, Mich.	W. E. N. Hunter
St. Mary's Church	Hudson, N. Y.	Morgan & Milliman
First Church of Christ, Scientist	Kenosha, Wis.	C. D. Faulkner
W. T. Grant Stores	Yonkers, N. Y.	P. A. Cunius
Apartment Building (210 E. 73rd St.)	New York, N. Y.	Emery Roth
Branch Library	Boston, Mass.	Cram & Ferguson
Whitmarch Mausoleum	Tarrytown, N. Y.	Presbrey-Leland
Forman Residence	Buffalo, N. Y.	E. B. Green
St. Peter's School	Mansfield, Ohio	Comes, Perry & McMullen
St. Thomas' Seminary	Bloomfield, Conn.	Louis A. Walsh
Sacred Heart Church	Waterville, Me.	O'Connell & Shaw
Holy Name of Jesus Church	East Orange, N. J.	Maginnis & Walsh
Temple Beth El	Brooklyn, N. Y.	Shampan & Shampan
Swedenborgian Church	Bryn Athyn, Pa.	Bryn Athyn Studios
E. B. Gallaher Residence	Norwalk, Conn.	P. L. Fowler

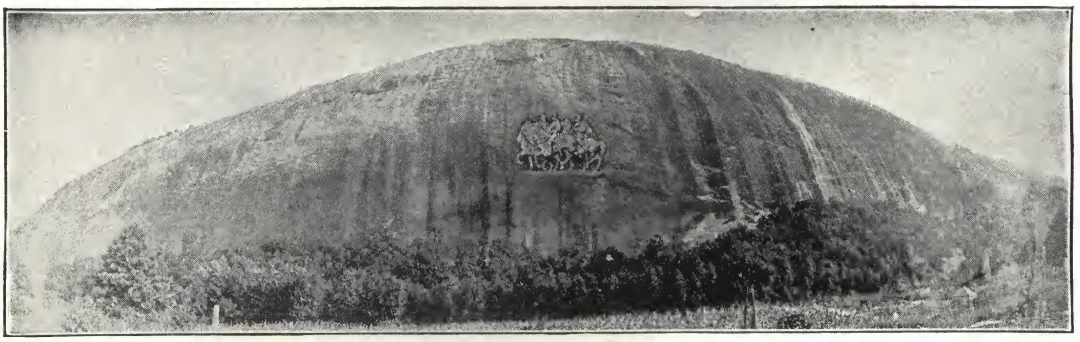
STONE MOUNTAIN GRANITE CORPORATION

Producers of Granite and Manufacturers of Granite Products

STONE MOUNTAIN, GA.

The Quarries

This corporation operates the granite quarries in the Stone Mountain area, sixteen miles east of Atlanta, in the eastern section of DeKalb County, Georgia, the site of the famous mountain of solid granite on the face of which the Confederate Memorial, of heroic proportions, is being carved. Incidentally, Stone Mountain Granite Corporation is doing this carving under contract. However, many years before the Stone Mountain memorial project was conceived, the stone from these quarries had already received the highest endorsements as a structural and monumental granite.



Bas-relief of Stone Mountain Confederate Memorial

Three figures, 130 ft. high by 200 ft. long, being carved by Stone Mountain Granite Corporation
Augustus Lukeman, Sculptor

Character of Stone

Stone Mountain granite is remarkably uniform in color, texture and composition. It has a very low iron oxide content, with no sulphides or other impurities that are unstable under weather conditions.

Analysis

Numerous analyses of Stone Mountain granite have been made from time to time, the following by S. W. McCallie, State Geologist, being typical:

Silica	72.56%	Magnesia	.20%
Alumina	14.81%	Soda	4.94%
Iron Oxide	.94%	Potash	5.30%
Lime	1.19%	Loss on Ignition	.70%

Physical Tests

In the course of its long history Stone Mountain granite has been subjected to physical and mechanical tests for specific projects on many occasions. The findings of three such tests are cited below.

Test for Absorption—On January 6, 1887, F. W. Clarke, chief chemist, reported to J. W. Powell, Director of U. S. Geological Survey on the results of an absorption or porosity test of Stone Mountain granite. The combined weight of two samples after having been dried in an oven was 666.2 grams. After immersion for 48 hours and removal of surface dampness they weighed 666.5 grams. Mr. Clarke concluded that inasmuch as the stone absorbed no appreciable amount of water it would well withstand the disintegrating action of frost.

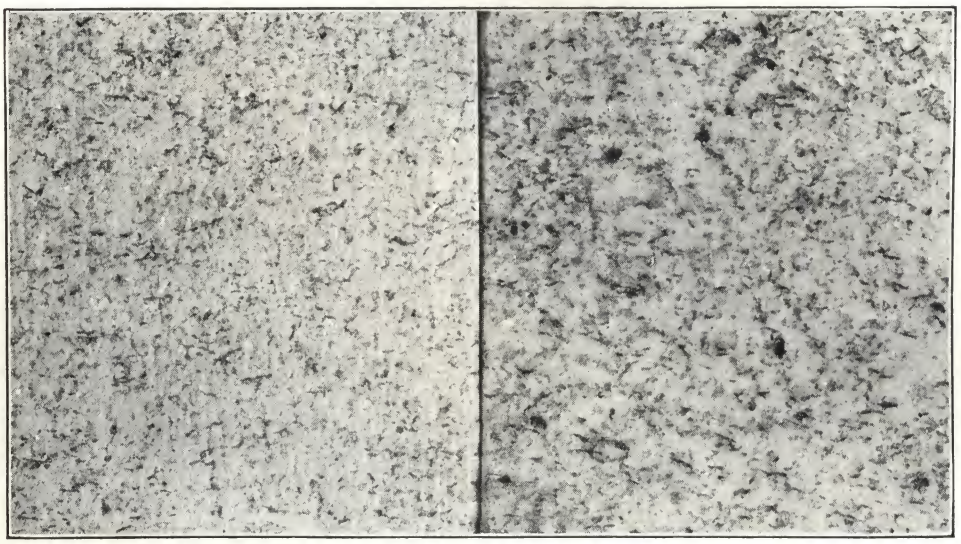
Crushing Test—On March 4, 1924, the Ordnance Department of the U. S. Army reported on a test made to determine whether Stone Mountain granite could be used on the government dry dock project at Balboa, Panama. The first cracks developed at from 12,972 to 23,950 lb. per sq. in. and the ultimate strength shown was from 20,461 to 24,650 lb. per sq. in.

Test for Resistance to Sea Water—On August 29, 1924, S. W. Stratton, Director, Bureau of Standards, Department of Commerce, Washington, D. C. reported to the Purchasing Department of the Panama Canal that two identical samples of Stone Mountain granite, boiled for 24 hours in distilled and in a 5% salt solution, respectively, showed a difference in loss of weight of only .04 of 1%, and concluded that the action of sea water on this stone would be practically negligible.

Service and Equipment

Quarries and plant are located on the Georgia Railroad, insuring prompt handling of shipments in all directions. Quarries contain ledges from which monoliths of practically unlimited size can be taken. A competent technical staff, a large plant thoroughly and modernly equipped, and a steady force of expert workmen, provide for the execution of the largest contracts with speed and exactitude.

To memorial contractors who might otherwise hesitate to undertake a mausoleum or other large project we lend every necessary assistance in planning and erection.



Hammered Surface — Polished Surface

Exact Photographic Reproductions, Showing Grain, Shading and Texture of Stone Mountain Granite

References

For more than a generation Stone Mountain granite has been used in practically every section of North America for every conceivable construction and monumental purpose. Many leading architects and contractors habitually specify this granite by name because they know that by so doing they are insuring the best in material and workmanship. Architects, engineers, memorial contractors, and others interested in granite—either in a general way or for some definite project—are invited to communicate with us direct for any information or assistance they may desire.

SULLIVAN GRANITE COMPANY

Producers of Extra Fine Grained Blue-White Westerly Granite

WESTERLY, R. I.

Products

EXTRA FINE GRAINED BLUE-WHITE WESTERLY GRANITE in the ROUGH for Mausoleums, Memorials and Statues.

Also Crushed Granite—screened to any size desired—for use in cement for floors and construction work, also for roads, walks and drives.

Character of Granite

All the Westerly Granite known as Extra Fine Grained Blue-White Westerly Granite is quarried by the SULLIVAN GRANITE COMPANY. This granite is uniform in color, nice and white when hammered and a bright blue when polished, and is very fine grained and exceedingly hard. The longer it is exposed to the weather the better it looks. Fine hammered or carved it is distinctive in appearance. It takes a brilliant and permanent polish. Because of its especially fine grain this granite is particularly well suited for memorial purposes and carving in granite. Its hardness and clear light color give effective definition to the most delicate details of ornament.

World War Memorial, Pawcatuck, Conn.
LOUIS A. WHITEHOUSE, Sculptor, Boston, Mass.

Quarries

The quarries of the SULLIVAN GRANITE COMPANY have been in continuous operation since 1834, and are operated the year around. Dimension granite in the rough in unlimited quantities is always available. Some of the largest granite blocks ever produced have been shipped from these quarries. The granite is unvaryingly uniform in color and texture; and every piece is subject to rigid inspection before shipping, to insure against the slightest flaw.

The granite, cut to size, is delivered to any of the several first class finishing plants at Westerly or shipped to any part of the country for finishing.

Facilities

Every modern device for quarrying and handling granite in all sizes is in use by the SULLIVAN GRANITE COMPANY, which makes it possible to fulfil large contracts promptly and satisfactorily.

The quarries are advantageously connected by spur track with the main line of the New York, New Haven & Hartford Railroad.

Service

Architects and other users of granite are invited to visit the quarries at any time.

Prompt attention is given to requests by mail for information or estimates. Samples are willingly furnished upon request.

All responsible finishing plants can give quotations on work to be executed in Extra Fine Grained Blue-White Westerly Granite. The company will furnish a list of those firms equipped to handle any project in the best manner.

Charles I. Corby Mausoleum, Washington, D. C.
CHARLES BARTON KEEN, Architect

References

Mausoleums

Charles I. Corby Mausoleum, Washington, D. C., Charles Barton Keen, Philadelphia, Architect
Borland Mausoleum, Poughkeepsie, N. Y., Ross & McNeil, New York, N. Y., Architects
Flower Mausoleum, Pittsburgh, Pa., Albert G. Lowe, Pittsburgh, Pa., Architect
John E. Andrus Mausoleum, New York, N. Y.
Richard Kyle Fox Mausoleum, New York, N. Y.
Besse Mausoleum, Springfield, Mass.
Fabian Mausoleum, Saddle River, N. J., Fred Wesley Wentworth, Paterson, N. J., Architect
Moore Mausoleum, Westerly, R. I.
Langmade Mausoleum, North Baltimore, Ohio

Memorials

World War Memorial, Pawcatuck, Conn., Louis A. Whitehouse, Boston, Mass., Sculptor
Uppercu Memorial, New York, N. Y.
Eben D. Jordan Memorial, Boston, Mass.
Armour Memorial, Chicago, Ill.
Theodore Roosevelt Memorial, Oyster Bay, N. Y.
Paulsen Memorial, Spokane, Wash.
Chapin Memorial, Springfield, Mass.
Fitzsimons Memorial, Cleveland, Ohio
Ensley Memorial, Bradford, England
Joseph Belfield Memorial, Providence, R. I.

J. S. SWINGLE INC.

Quarriers of "Peerless" Quincy Building and Monumental Granite

66 Granite Trust Building

QUINCY, MASS.

Adaptability

"Peerless" Quincy Granite is particularly suited for high grade polished monumental work in combination with ornamental bronze.

There is a constant demand by leading architects and builders for this granite in building projects for polished base courses, columns and specialty work. This is due to the present economical methods of quarrying, together with the character of the stone and its ability to retain its beauty and freshness after countless years of exposure.

Quarry Production

The Swingle Quarries have been active constantly for the past seventy-five years, enabling us to quarry in a deeper strata of granite in the heart of the best and most uniform stone available in the district.

Texture and Analyses

"Peerless" Quincy Granite is composed principally of three of the hardest mineral substances known—feldspar, quartz and hornblende—thus guaranteeing its ability to successfully withstand the ravages of time as well as to resist the stress and strain to which it may be subjected.

The following data taken from: C. H. Warren "Petrology of the Alkali—Granites and Porphyries of Quincy and the Blue Hills, Massachusetts." Proceedings, American Academy Arts and Sciences, Volume XLIX, September 1913, pages 203-330.

1. Minerals are chiefly
   55.6% Albite—Microcline Microperthite (Feldspar)
   33.3% Quartz
   9.6% { Riebeckite, Aegirite } Amphiboles
   1.5% { Magnetite, Ilmenite, Zircon }

2. Chemical Analysis

Average of three analyses

SiO_2	74.86	FeO	1.25	Na_2O	4.30
Z_2O_2	.20	MnO	.02	K_2O	4.64
Al_2O_3	11.61	MgO	.05	TiO_2	.20
Fe_2O_3	2.29	CaO	.41	H_2O	.35

Colors

We produce from our four quarries all the varied shades of stone which are found in the district, as follows:

Peerless Extra Dark—A rich, live bluish dark stone, taking a high polish, suitable for the most exacting demands.

Peerless Dark—Very similar to the above, but of a slightly lighter color, also taking a high polish.

Peerless Syenite Blue—A medium shade, with considerable quartz, and a light blue shading. Takes a high polish, but has not the deep coloring of the two preceding grades.

Peerless Light—A light colored granite, not suitable for polished work, but used extensively for memorial bases and axed building work where a cheaper stone is required.

Facilities

Modern electric and pneumatic equipment permit us to quarry and ship in large volume, guaranteeing service and quality to the building trade.

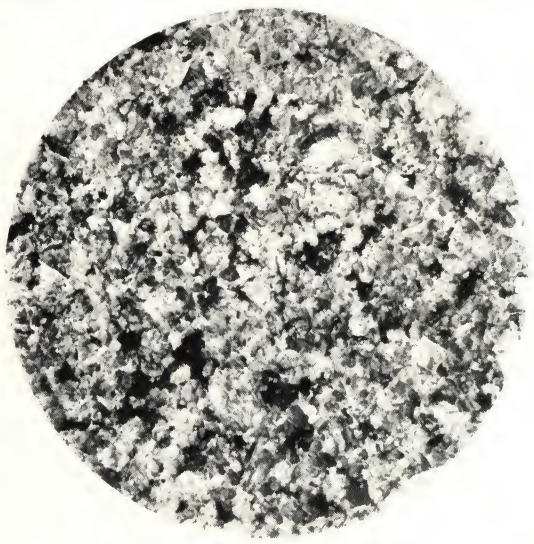
We do not manufacture nor fabricate material. We confine ourselves entirely to the production of the rough blocks which we supply to all responsible cutting and dressing plants. You may consult with confidence any reputable manufacturers in your territory.

Service, Estimates, Samples

We are glad to co-operate with architects and builders in working out any problems in connection with the use of granite. Estimates and samples supplied to interested parties.

Architects and engineers in search of the most beautiful and lasting granite obtainable should not fail to consider this granite when richness with dignity are desired in the completed building or memorial.

Specify Swingle's for satisfaction.



Polished Finish

Extra Dark Quincy Granite

These illustrations are shown for grain and texture only. No attempt has been made to show the real beauty of the stone

Rubbed Finish

APPALACHIAN MARBLE CO., INC.

Quarriers and Manufacturers of Appalachian Tennessee Marble
Manufacturers of Foreign and Domestic Marble

KNOXVILLE, TENN.

APPALACHIAN TENNESSEE MARBLE especially for interior use, including Appalachian Tavernelle, Appalachian Roseal, Appalachian Golden Vein, Appalachian Gray, Appalachian Champion Pink, Appalachian Dark Chocolate, Appalachian Mahogany, Bond Pink, American Pink, and other Appalachian Colors.

FOREIGN and DOMESTIC MARBLES, FLOOR TILE, ASHLAR, MARBLE FLAGSTONES, TENNESSEE GRANITO.

Quality

Appalachian Marbles are non-absorbing, long wearing, strong and easily workable.

	Average
Co-efficient of absorption	.047
Tensile strength (transverse to bed)	1,554 lbs. per sq. in.
Tensile strength (with bed)	1,551 lbs. per sq. in.
Transverse strength (modulus of rupture)	2,686 lbs. per sq. in.
Compressive strength	18,274 lbs. per sq. in.

These tests made by U. S. Bureau of Standards and reported by T. Nelson Dale, Retired Geologist, U. S. Geological Survey.

Standard Thickness

Appalachian Marble is cut in standard thicknesses. They are (after honing and polishing): 7/8, 1¼, 1½ and 2 inches. Other thicknesses on order.

Floor Tile

Appalachian Tennessee Floor Tile comes in 8x16, 10x20 inches and 12 inches square, standard sizes. It can also be obtained in any special sizes the architect may desire for exactly carrying out his own ideas. It can be had in a wide variety of beautiful colorings.

Appalachian floors are low in initial cost, low in maintenance cost and last the life of the building. They are easy and economical to keep clean, materially reduce the dust nuisance and make for better health. They subdue traffic noise and afford a safe, comfortable walking surface.

8x16 and 10x20-inch tile are always on hand, and shipment can be made on receipt of order.

Ashlar

Appalachian Marble tile for ashlar, either hone or polish finish, can be furnished in our standard tile sizes at prices which make marble ashlar available for the comparatively moderately priced home as well as for more pretentious structures. This is because it is one of our by-products.

Tennessee Granito

Sizes No. 1, 2 and 3 for terrazzo floors. In three colors, select light colored, pink and dark cedar.

Tennessee Marble Flagstones

For sun room, terraces, garden walks and stepping stones. Can be laid in distinctive and exclusive design, in shapes just as taken from our yard.

To meet the increasing demand for such uses of Tennessee flagstones, we have provided large storage facilities and can give immediate delivery.

Price

Because of quantity production Appalachian Marbles, although as beautiful as most fine foreign marbles, are a great deal cheaper in price. For the same reason, the cost of Appalachian Marbles is also lower than the majority of first quality domestic marbles.

Installation

Appalachian Marble has been manufactured exclusively by us for twenty years. More than $1,000,000.00 of it is sold annually in England, Canada, Latin America and every state of the Union.

Many of the most noted public and office buildings, churches, schools, theaters, hospitals, stores, banks, etc., have interiors, including floors and ashlar work, of Appalachian Marble.

Foreign Marble

Our established connections with the leading foreign quarries enable us to manufacture practically any desired foreign marble at a substantial cost saving.

Prompt Shipments, Low Rates

Huge production facilities and entire absence of labor troubles insure quick deliveries. Freight rates on marble from the Appalachian mill are estimated at commodity rates to all points in the United States and Canada.

Samples

Polished samples, showing the beauty of the Appalachian Marbles, will be sent to any interested architect or contractor, upon request.

Cost Estimates and Co-operative Service

The Service Department of the APPALACHIAN MARBLE CO., INC., welcomes the opportunity to co-operate with the architect. This co-operation reaches its highest state of efficiency when architects furnish the Appalachian Service Department with blue prints of the projects upon which they are working. The Service Department is then in a position to carefully estimate on work and offer all possible co-operation.

All Marble from One Source

Though a project may contemplate the use of foreign marble in addition to Appalachian Tennessee and other domestic marble, the complete cost estimate may be obtained from the Appalachian Service Department. Obtaining all marble from one source is not only a convenience but has definite shipping and price advantages.

Marble Working Drawings

Complete marble working drawings are made up by our drafting department to be used in submitting to the architects for approval as to jointing and for the securing of accurate Building Measurements.

Catalogue

A copy of the elaborate Appalachian loose leaf catalogue, illustrated in full colors, will be gladly furnished to architects and others interested in interior marble.

JOHN J. DEERY COMPANY, INC.

Importers and Wholesalers of Foreign and Domestic Marble and Stone Swedish and Norwegian Granites in the Blocks and Rough Slabs Only

HOME OFFICES
Erie Avenue and "F" Street
PHILADELPHIA, PA.

STORAGE YARDS AND SAWMILLS

PHILADELPHIA, PA. — LONG ISLAND CITY, N. Y. — MONTREAL, CANADA

BRANCH OFFICES

CHICAGO, ILL., 218 West Superior Street
KNOXVILLE, TENN., 604 Empire Building
WASHINGTON, D. C., 930 New York Avenue
LOS ANGELES, CALIF., Union Bank Building
SAN FRANCISCO, CALIF., 275 Bush Street

SAMPLE ROOMS: Architects Building, 101 Park Avenue, NEW YORK, N. Y.
Erie Avenue and F Street, Philadelphia, Pa.

Sole Agents for Leading European Marble Producers

We are the sole agents for Merbes-Sprimont, the leading marble producers in Europe, with mills in every principal country. All our marbles and stones are carefully inspected for soundness, color regularity, and correct sizes. Look for our trade-mark (Sterling Marbles) designated by our flag—your assurance and safeguard when you write specifications. It means the best quality obtainable at the price.

Wide Assortment of Colors

No matter what the color scheme desired, no matter what the appropriation, we are in a unique position to offer a marble that will conform to the desired effect, whether the specifications call for the more moderate-priced or the more costly varieties. Our great assortment assures you of that.

Marble for Every Requirement

Our complete European organization, our unlimited selection, our trained personnel, and our desire to render every possible architectural service, places us in a unique position in this country to meet every requirement of the trade.

Prices and Information

We are always pleased to mail free samples of those marbles listed here which are not shown in our album of colored reproductions. May we co-operate with you in solving your marble and stone problems?

To assist the architectural profession in the selection of marbles, we are listing them, this year, according to their average price in the block delivered f.o.b. New York, Philadelphia or New Orleans, duty paid.

Home Offices

MARBLES AND STONES AVAILABLE FROM THE YARDS OF JOHN J. DEERY COMPANY, INC.

DOMINANT COLOR	LOW PRICE MARBLES From $2.50 to $5.00 a cubic foot in the rough blocks, f.o.b. New York, Philadelphia or New Orleans, duty paid.	MEDIUM PRICE MARBLES From $5.00 to $7.50 a cubic foot in the rough blocks, f.o.b. New York, Philadelphia or New Orleans, duty paid.	HIGH PRICE MARBLES From $7.50 upward a cubic foot in the rough blocks, f.o.b. New York, Philadelphia or New Orleans, duty paid.
Blacks	Belgian Black (Genuine) Belgian Black "B" Noir Coquille Belgian Petit Granit Bleu Belge Grand Antique Ste. Anne de Hon Black and White	Genuine Bleu Belge Ste. Anne Belge Petit Melange Ste. Anne Belge Grand Melange Breche Portor Arlecchino Breche Portor Imperiale Spanish Grand Antique	Black and Gold St. Laurent Veine Grand Antique des Pyrenees
Yellows	Dark Botticino Light Botticino Comblanchien Hauteville-P Yellow Verona Rocheron Travertine (stone) Verdella	Breche Ropocevo Jaune Ambre Jaune de Brignoles Jaune 39 Geneva Golden Vein Yellow Siena Galena	Algerian Onyx Dore Brocatello Siena
Grays	Logan Gray (Domestic) Gris de Maceira Fleur de Lilas	Boisjourdan Lumachelle	
Browns	Montanello Lunel Fonce Lunel Rose Lunel Uni Clair Lunel Joinville	Napoleon Grand Melange Lunel Notre Dame "A" Lunel Notre Dame "B"	
Reds	Red Verona Morelena Rose de Provence	Breche Orientale Rouge Belge Griotte Fleuri Rouge Royal Belge Campan Griotte Red Levanto Rouge Byzantin Rouge de Vitrolles Rouge Archipi Languedoc Breche Rose	Campan Melange
Purples		Breche Violette	Fleur de Pecher
Violets		Violet de Brignoles Verde Molino	Grethenstein
Whites		Venato Giardino Calacata White Italian (every variety) Arabescato	Bianco Arni Statuary Bianco P.
Colored Whites	Lesina Stone	Breche Stazzema Rose Aurore (all types) Venato Crocicchio fiume Vigaria Bianco Rosado	
Greens		Green Levanto Forest Green Vert Alpicella Vert des Alpes Cipollino Versilia Vert d' Estours	Brazilian Onyx Campan Melange Vert Vert St. Denis
Blues		Bleu de Lagoa Bardiglio Fiorito Bardiglio Tigrato Breche Ropocevo Bardiglio Costaccia	
Pinks	Lioz Rose Almiscado Rosato	Rose de Brignoles Rose Perle	
Miscellaneous		Breche de Salernes Sarrancolin (every variety)	Etla Onyx Mimosa

THE GEORGIA MARBLE COMPANY

TATE, GEORGIA

SERVICE OFFICES

NEW YORK, N. Y., 1328 Broadway
ATLANTA, GA., 814 Bona Allen Building
CHICAGO, ILL., 648 Builders Building
CLEVELAND, OHIO, 1200 Keith Building
DALLAS, TEX., 622 Construction Industries Building

Products

A durable marble suitable for interiors, exteriors, and monuments, statues, etc., available in the following colors:

White—This ranges from almost pure white to white with more or less dark markings, known as *White Georgia* and *Kennesaw.*

White Cherokee—White with gray wavy veining and clouding well distributed.

Cherokee—A very light gray with clouding and veins running in waves well distributed.

Silver Gray—A uniform pearl gray, practically free from marking.

Mezzotint—Gray background with rather heavy dark marking occurring in waves, between *Silver Gray* and *Creole.*

Creole—Heavily veined and having white background with black and bluish-black veining and figures.

Verde Antique—Ranges from medium green to dark green with colored veins.

Etowah—Sometimes known as *Pink Georgia,* ranges from a very light salmon to a deep old rose with very warm tints.

Note: The above marbles are of uniform grade and are recommended for either exterior or interior use in any climate.

Rosepia—This is a fine textured marble differing from the marbles mentioned above. It is a light buff color, lightly tinted with rose. It is recommended for interiors.

New York Trust Company, New York, N. Y.
Cross & Cross, Architects
Georgia White Marble

Statuary

Georgia Marbles are unexcelled for sculpture work exposed to the weather. The marble is unaffected by the most severe changes of climate. We furnish large size blocks.

General Information

Marble is supplied either in the rough or in finished form to be set by the contractor or builder, or, for the larger structures, contracts are taken for the complete erection by The Georgia Marble Company according to the architect's specifications.

Complete installations of interiors requiring any kind of domestic or foreign marbles are also contracted for by The Georgia Marble Company.

This organization through its many years of experience in handling large building projects is thoroughly equipped from drafting department through to erection department to handle the entire work efficiently and extend the fullest co-operation to architect and builder.

Preliminary Consultations

Very often, before the architect is ready to issue final specifications, questions will arise concerning details and price of marble work. At any of the *service offices* listed above are men who will gladly co-operate during this earlier stage of the work, giving all necessary information, including approximate estimates of cost.

We also invite preliminary consultation with the architect in the matter of jointing and detailing as it has sometimes been found that simple changes will save thousands of dollars. This is particularly true where plain marble trim (marble with little or no carving on it) is used to *dignify* the lower stories of large commercial buildings.

Scope

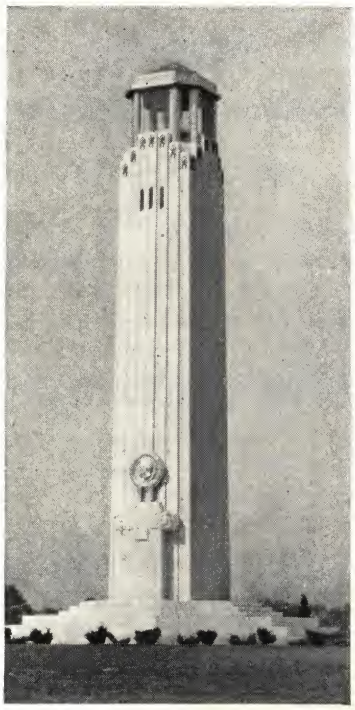
The work of The Georgia Marble Company is divided into three main branches: Exterior Building Work, Interior Building Work, and Monumental Work. (Monumental work includes not only large public memorials, but mausoleums and cemetery memorials.)

Facilities

Quarries—Eight to ten quarries, capable of producing upwards of 1,000,000 cubic feet of marble per year, are operated by The Georgia Marble Company. Due to the equable climate, quarrying activities are carried on throughout the entire twelve months.

Plants—The plant at Tate, Georgia, specializes in monumental work. But the unusually large sawing capacity at Tate is more than enough for the monumental business and is used to supply additional sawed stock to the other plants. The plant at Nelson, Georgia, handles principally exterior building work. The plant at Marietta, Georgia, handles principally interior work. These three plants have been planned, however, so that each plant is equipped to handle work in any of the three classes mentioned above. This has proved to be a great *balance wheel*—an assurance that finished marble will be delivered on or before the specified time.

In addition to the three main plants, a fourth plant, at present equipped only with gang saws, is ready to receive finishing machinery whenever the capacity of the other plants is reached.



William Livingstone Memorial Lighthouse, Near Detroit, Mich.
ALBERT KAHN, Architect

Physical Properties

Crushing Strength—Over 10,000 pounds per square inch.

Analysis—Over 98% pure carbonate of calcium. (No iron content.)

Water Resistance—The absorption of moisture being the chief cause for disintegration of building stones, the selection of a stone with the lowest possible porosity is always desirable.

A large number of absorption tests show phenomenally low absorption for Georgia Marble—the average being considerably under 5/100 of 1% by weight, only about 1/6 as much as was absorbed by the best of the standard granite samples that were examined.

Reports of Tests—Supporting and amplifying the information given above, test reports are available to those interested.

Among the laboratories that have tested Georgia Marble are the following:

United States Bureau of Standards.
United States National Museum, George P. Merrill.
Ordnance Department, United States Government.
Washington University Testing Laboratory.
Robert W. Hunt Company, Engineers.
Watertown Arsenal, Major Ord.

Finishes

All varieties of Georgia Marble, as any other marble, are susceptible to smooth sand rubbed, honed or polished finishes. In addition, we have found by long years of experience that the extreme hardness and the crystalline character of Georgia Marble lends itself admirably to texture finishes.

A variety of texture finishes has been used for important Georgia Marble buildings. Texture finishes tend to lighten the color of the marble and soften the veining, whereas the smoother finishes emphasize the veining.

References

A few important Georgia Marble subjects together with the architect or the sculptor are listed:

Exteriors—
New York Trust Co. Building, Fifth Ave. and 57th St., New York, N. Y., Cross & Cross, Architects
Field Museum, Chicago, Ill., Graham, Anderson, Probst & White, Architects
Monroe County Savings Bank, Rochester, N. Y., Uffinger, Foster & Bookwalter, Architects
U. S. Post Office, New Orleans, La., Hale & Rogers, Architects
Federal Reserve Bank, Cleveland, Ohio, Walker & Weeks, Architects
Folger Library, Washington, D. C., Paul P. Cret, Architect

Monumental and Sculptural—
Bok Memorial Tower, Mountain Lake, Fla., Milton B. Medary, Architect, Lee O. Lawrie, Sculptor
Lincoln Statue (in the Lincoln Memorial), Washington, D. C., Henry Bacon, Architect, Daniel Chester French, Sculptor
McKinley Memorial, Niles, Ohio, McKim, Mead & White, Architects, J. Massey Rhind, Sculptor
Harding Memorial, Marion, Ohio, Henry Hornbostel and Eric Fisher Wood, Architects
William Livingstone Memorial Lighthouse, Belle Isle, near Detroit, Mich., Albert Kahn, Architect

Interiors—
Guardian Bank & Trust Co., Cleveland, Ohio, Walker & Weeks, Architects
Fairmount Mausoleum, Newark, N. J., Wm. Henry Deacy, Architect
Chrysler Building (toilet partitions on all floors), New York, N. Y., William Van Alen, Architect
First National Bank, Atlanta, Ga., Pringle & Smith, Architects

Samples and Literature

Samples and literature will be sent to any one interested in the use of marble.

Chrysler Building, New York, N. Y.
WILLIAM VAN ALEN, Architect
Typical men's toilet partitions of Georgia Creole Marble

VERMONT MARBLE COMPANY

Producers and Manufacturers of Exterior and Interior Marbles

PROCTOR, VT.

BRANCHES AND SALES OFFICES

BOSTON, MASS., 44 School Street
ALBANY, N. Y., 1318 Standard Building
CHICAGO, ILL., 5535 No. Lincoln Street
CLEVELAND, OHIO, 500 Hickox Building
DETROIT, MICH., 1560 First National Bank Building
LOS ANGELES, CAL., 857 Roosevelt Building
NEW YORK, N. Y., 101 Park Avenue
PHILADELPHIA, PA., 22nd and Westmoreland Streets
SAN FRANCISCO, CAL., 244 Brannan Street
TACOMA, WASH., East End 11th Street Bridge
WASHINGTON, D. C., Commercial National Bank Building, 14th and G Streets, N. W.
DALLAS, TEX., Vermont Marble Company of Texas, 1513 Wall Street
HOUSTON, TEX., Vermont Marble Company of Texas, 1045 Electric Building
SAN ANTONIO, TEX., Vermont Marble Company of Texas, 507 Milam Building
TORONTO, ONT., Ontario Marble Co., Ltd., 308-9 Manning Chambers Building

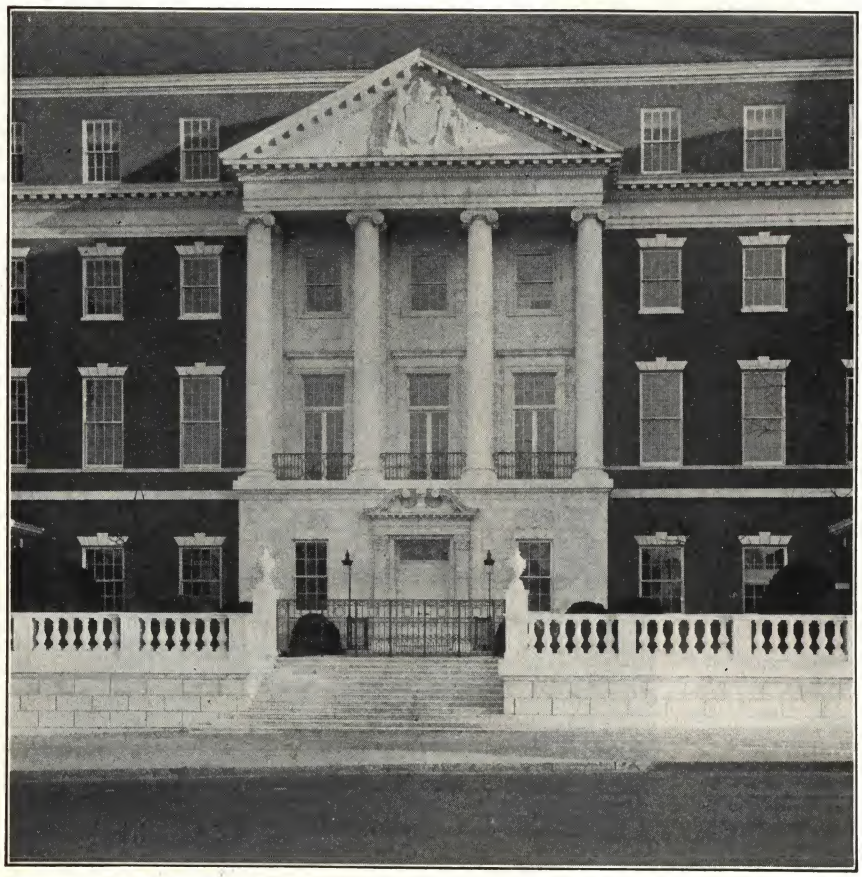
Facilities

The company has large sawing mills and finishing plants in Vermont; also finishing plants in Philadelphia, Cleveland, Chicago, Dallas, Houston, San Francisco and Tacoma.

At Tacoma is the storage yard for the Alaska marble for shipment in rough or finished state. It can also be supplied from any of the other plants.

Varieties

Exterior—Mountain White Danby, Imperial Danby, Highland Danby, Corona, Eureka and Pearl Gray Vermont.



Museum of the City of New York—Imperial Danby Marble and Brick
JOSEPH B. FRIEDLANDER, Architect

Interior—***Vermont Marble***—Over 40 varieties, including white, lightly clouded and veined; gray, light green and dark green; red and black.

Alaska Marble—Several kinds, pearl white veined with gray or black predominating.

Colorado Marble—The VERMONT MARBLE COMPANY is now the sole sales agent for the marble known as Yule Colorado.

Suggested Specifications for Exterior Marble

Material—All cut stone work shall be (insert name of variety of marble wanted).

Quality—All marble entering into the construction of the work shall be selected for uniform color. It must be free from cracks, chips, stains, or other defects upon exposed surfaces.

Samples — Before proceeding with the work the contractor shall submit a sample 4x8x2 in. of the marble he proposes to use. One face of this sample shall have (specify what finish is desired).

Joints—All marble shall be cut for $\frac{3}{16}$-in. joints.

Finish—All exposed surfaces of marble work shall have (specify desired finish).

Drawings — Detailed drawings will be furnished by the architect for all work requiring them. The contractor shall make and submit for the architect's approval, shop drawings showing in plan and elevation the dimensions of all stones, position of joints, and the spacing of dentils or other repeated ornament.

Cutting—All cutting must be done in a workmanlike manner and in accordance with the shop drawings referred to. All faces shall be free from winds, so as to present a true and even surface. Joints shall be at right angles to the face. Intersecting profiles shall be accurately cut. Re-entering angles

of mouldings shall be cut from the solid, unless otherwise shown by the drawings.

The contractor shall, where called for by the architect's drawings, cut the marble work to accommodate steel, flashings, leaders or other structural materials.

Delivery—All marble shall be crated or otherwise protected so as to be delivered at site in good condition.

Storage—All marble stored at the site shall be on cleats, off the ground, and protected where necessary from any stains from above.

Setting—Marble shall be set with a derrick and in full bed of mortar. The mortar bed shall be kept back at least 1 in. from the face of the stones.

Mortar—Mortar for setting marble shall be composed of 1 part white non-staining portland cement, 3 parts clean, sharp sand and a quantity of hydrated lime equal to 10% of the volume of cement.

Protection—During construction, all sills, moulding, or other work liable to injury shall be suitably protected by boards which shall not be removed until the cleaning and pointing is done.

Anchors—Anchors to be of wrought iron, heavily galvanized or painted two coats with an approved brand of dampproofing paint and allowed to dry before using.

For each stone 2 ft. long one anchor shall be used, and for each stone over 2 ft. long, at least two anchors. Provide suitable clamps at corners and such special anchors as the architect may direct. Balusters shall be doweled top and bottom with brass, copper, zinc or some other non-staining metal.

Pointing and Cleaning—All exposed surfaces of the building shall, on completion, and when directed by the architect, be cleaned with clean water only and fiber brushes.

All joints shall be raked out, 1 in. back from the face, and carefully pointed with a mixture of 1 part white non-staining portland cement and 2 parts clean white sand. Joints shall be ruled with a tool of approved shape.

Vermont Interior Marble Service

We contract either for interior marble work installed or to finish and furnish it to local interior marble dealers, following whichever method will give best service to architects, contractors and owners.

Suggested Specifications for Interior Marble

Material—All interior marble shall be as follows: All toilet marble, Vermont Venoso; all corridor marble, Vermont Brocadillo. (Always insert the name of the desired grade, avoiding the too general term "Vermont Marble.")

Quality—All interior marble shall be of good quality, free from stains. Patching will be permitted only where natural imperfections of a particular stone are subject to correction by the established usage of the industry.

Samples—Before proceeding with the work contractor shall submit to the architect samples of all marble specified above, 1 ft. square and 7/8 in. thick.

Finish—All floors and stair treads shall have a fine sand finish.

All standing marble shall be highly polished.

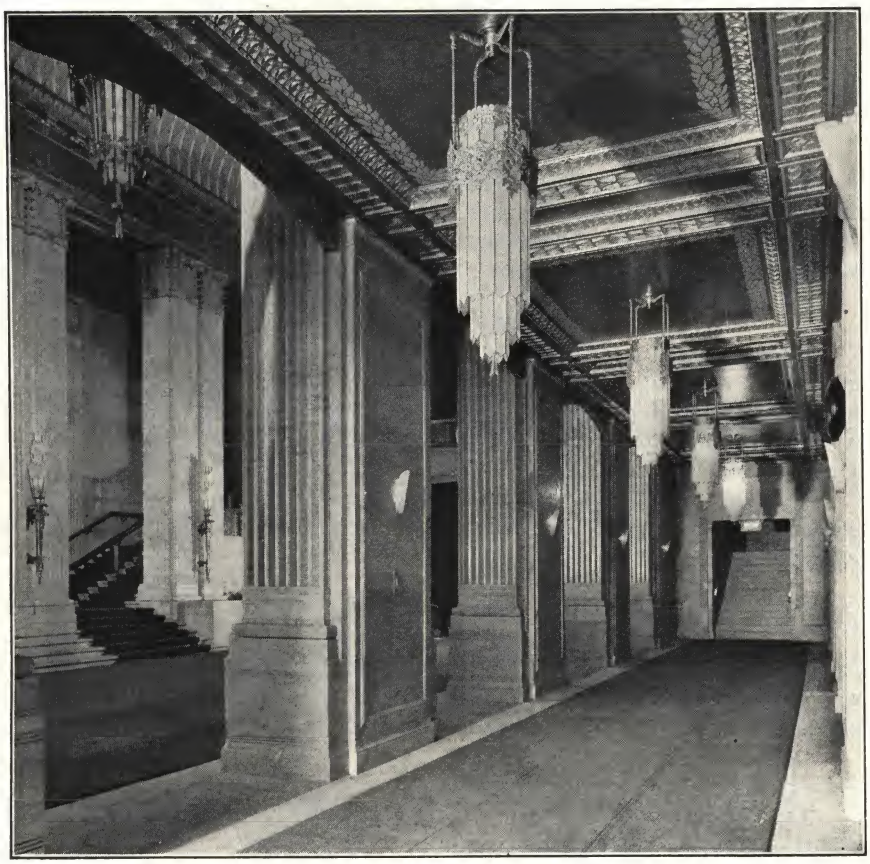
Drawings—Detailed drawings will be furnished by the architect for all work requiring them. Contractor shall make and submit for the architect's approval, shop drawings showing proposed jointing.

Measurements—Before proceeding to finish the interior work contractor shall verify all measurements at the building.

Cutting—The marble contractor shall do such necessary cutting and fitting to accommodate his work to other trades as is sanctioned by common usage in the trade.

Setting—All floor marble shall be set in a cement mortar of 1 part cement and 3 parts sand, adding a quantity of hydrated lime, not exceeding 10% of the volume of cement. Concrete fill must be swept and thoroughly sprinkled before setting is started. All stair treads and all standing marble shall be set in plaster of paris.

All wall marble shall be securely anchored with brass, copper or aluminum wire.



Civic Opera, Chicago—Vermont, Tennessee and Foreign Marbles
GRAHAM, ANDERSON, PROBST & WHITE, Architects

Section of Cornice, West Virginia Capitol Rotunda, Charleston—Vermont Marble
CASS GILBERT, Architect

When work is completed all marble shall be cleaned and left in good condition.

Foreign Marble

The VERMONT MARBLE COMPANY is ready at all times to provide, finish and install marble from European and other foreign quarries.

Classes of Work Supplied

Wainscot and interior decorative treatment generally: floor tile, stair treads, bank screens, counter tops, soda counters, electric switchboards, scale tops, lamp bases, and many other purposes.

Adaptability

Innumerable are the ways in which Vermont marble may be applied to building construction. Nor is it merely a beautiful product. It is thoroughly sanitary as well as fireproof, though it may be readily cleaned. It needs no refinishing.

Although initial cost of marble may be slightly in excess of certain other materials, in the end it is no more expensive.

Marble Exhibit in New York City

There is an exhibit of large-sized samples of our marbles at our New York office in the Architects' Building, 101 Park Avenue, to which architects, engineers, contractors and owners are cordially invited.

Composition

The composition of marble is less complex than almost any other stone. It is almost pure carbonate of lime, 98% or over in the form of the mineral calcite ($CaCO_3$).

A typical white calcite Vermont marble slightly mottled with gray, according to Geological Survey Bulletin 521, gives the following analysis:

Carbonates	99.174
Manganese and Aluminum Oxide	.005
Insolubles	.63
Organic Matter	.08
	99.889

Internal Structure

All Vermont marbles are made of tightly interlocked crystals. The crystals are interlocked more tightly in some marbles than others and vary in size in the different types. No other group of marble deposits in the world yields a greater range in size of crystal than those of Western Vermont.

Compressive Strength

The importance of crushing strength is greatly overestimated. Most stones on the market will support ten times as much weight as is ever required of them. Often rocks of high compressive strength are far less durable than others of lower test.

It means little to the average person to say that a stone will stand so many thousand pounds to the square inch. It is much simpler to say that the marbles we recommend for exterior building work could be used in the base of a tower 2½ to 3 miles high before failure from compression alone would result.

Marble is unusually flexible. Blocks of stone used in a building are often subjected to a bending strain due to improper setting. The movement necessary to relieve the strain may be imperceptible but it is enough to crack the average stone. Most marbles are flexible enough to allow readjustments to take place instead of fracture.

The weight of marble is approximately 170 lbs. to a cubic foot.

Hardness

Hardness in a stone simply means that it will resist abrasion, not that it will resist exposure to the weather.

The rock in which diamonds (the hardest known substance) occur is made of two minerals—one having a hardness of 6 to 7 Moh's Scale and the other a hardness of 5. The surrounding rock is made up largely of a mineral having a hardness of 2½. The diamond-bearing rock is much harder—yet it weathers and disintegrates so much more rapidly than the soft surrounding rock that circular depressions mark the place where it is found.

Absorption

The freezing of moisture, completely filling open spaces in a rock, is the most severe test to which that rock can be subjected. No stone has been found which is unaffected by this test. It follows, therefore, that

other factors being the same, the best stone is one which will exclude moisture most completely. Water expands when it freezes and forces the containing walls farther apart. Fracturing due to this cause increases greatly with the increase in absorption.

Other things being equal the stones which absorb the most water will be least likely to endure. The following statement was made by Dr. Hiram A. Cutting, the eminent geologist:

"I have no doubt that the capacity of a stone to absorb moisture is against its durability even in the warm climates, and vastly more so in a changeable and wintry climate where it is often frozen before any considerable part of the moisture from autumn rains can be evaporated."

In addition to the exceptionally low absorption of Vermont marble, all the pore space is not filled upon immersion.

The air that is locked in the micro-crevices is compressed under freezing conditions and acts as a cushion, saving the stone from the rupturing action of freezing.

In the flood of 1913 the Vermont marble interior of the City National Bank, Dayton, Ohio, was subjected to an unusual water test. Although it was submerged for three days, all that was needed to restore it to its original condition was a little cleaning.

Sculptured Head, Scott Fountain Cascades, Detroit—Vermont Marble
CASS GILBERT, Architect

Absorption Tests

Taken from bulletins issued by the United States Government:

Material—100 lbs.	Absorbs lbs. of water
Gray Vermont Marble	0.122
Brandon Vermont Marble	0.116
Pittsford Valley (Vt.) Marble	0.106
Danby (Vt.) Marble	0.102
Yule Colorado Marble	0.100

Weathering

Marble is the result of a sedimentary formation that has been metamorphosed by heat and pressure to a crystalline product. In this process any unstable constituents have been reduced to their ultimate condition and cannot decay further from atmospheric agencies alone.

The CO_2 fumes in the atmosphere of the modern city, when combined with rain water, have a solvent effect on natural building stones. The effect is in proportion to the freedom with which the acid may move through a rock. Marble is so impervious to moisture that the action is limited to the exposed surfaces of the stone.

In the process of weathering there is formed a protective coating which is nature's own best preservative.

That is one reason why we do not recommend the sandblast for cleaning.

Fire Resistance

Vermont marble will stand a heat of 1200° F. without injury.

The Security Savings Bank, San Francisco, a Vermont marble structure, was in the path of the great fire. Adjoining buildings of brick and stone were ruined by the intense heat, but the Security Bank remained intact. Several other cases of this kind might be cited.

Care and Cleaning of Marble

Marble is entitled at all times to the treatment which is given to any other fine product. It should be kept free from dirt and sources of stain, not alone while the building is in progress, but throughout its long and serviceable life.

Marble needs no redecorating or refinishing but does need occasional cleaning, and that work should be intelligently done.

A little book issued by the VERMONT MARBLE COMPANY, contains all the necessary instructions. This book will be sent to any one who will take the trouble to write for it.

"The Book of Vermont Marble"

A book of standard filing size giving condensed information relative to the quarrying, finishing, setting and detailing of marble. Furnished without charge to any architect on request.

ALBERENE STONE COMPANY

Spandrels and Exterior Trim

153 West Twenty-third Street, NEW YORK, N. Y.

BOSTON, MASS., 35 Stilling Street
CHICAGO, ILL., 1700 Elston Avenue
CLEVELAND, OHIO, 425 Schofield Building
NEWARK, N. J., 17 Academy Street
PHILADELPHIA, PA., 913 Liberty Trust Building
PITTSBURGH, PA., 506 Commonwealth Annex Building
RICHMOND, VA., 203 Builders' Exchange Building
ROCHESTER, N. Y., 29 Strathallan Park
WASHINGTON, D. C., 1757 K Street, N. W.

QUARRIES AND MILLS AT SCHUYLER, VA.

Products

ALBERENE STONE, natural quarried soapstone, is produced and fabricated for:

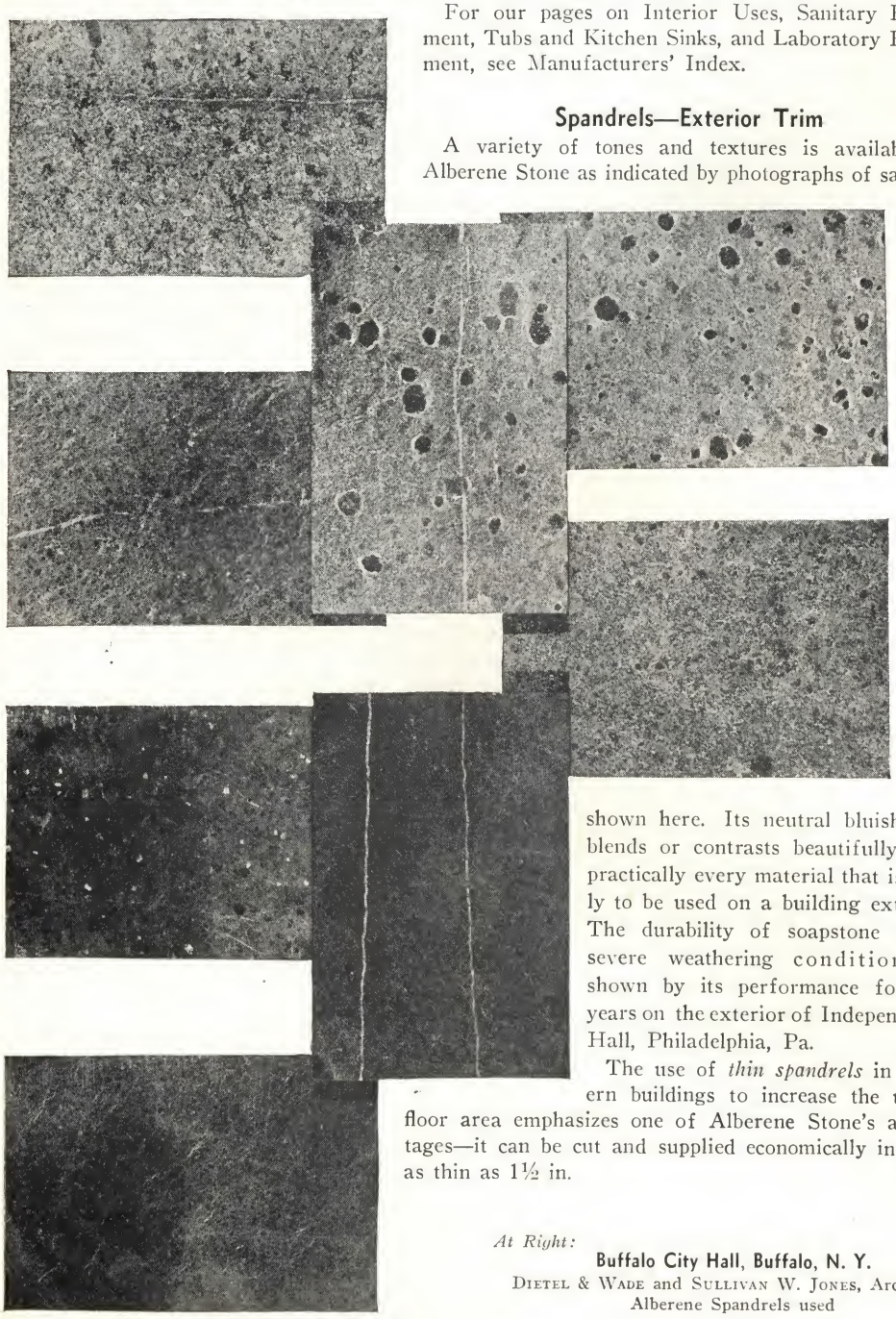
Exterior trim of all kinds, especially for spandrels where the beauty and advantages of a quarried stone are wanted and at the same time extreme thinness is a mechanical requirement.

Also Stair Treads and Landings; Flooring and Base Border; Door and Window Sills and Stools; Plinths, Wainscoting and Interior Trim; Fireplace Linings, Hearths and Mantels.

For our pages on Interior Uses, Sanitary Equipment, Tubs and Kitchen Sinks, and Laboratory Equipment, see Manufacturers' Index.

Spandrels—Exterior Trim

A variety of tones and textures is available in Alberene Stone as indicated by photographs of samples shown here. Its neutral bluish-gray blends or contrasts beautifully with practically every material that is likely to be used on a building exterior. The durability of soapstone under severe weathering conditions is shown by its performance for 200 years on the exterior of Independence Hall, Philadelphia, Pa.

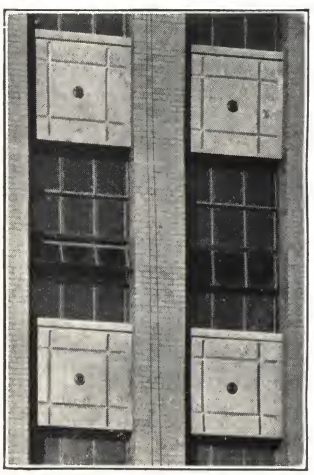


The use of *thin spandrels* in modern buildings to increase the usable floor area emphasizes one of Alberene Stone's advantages—it can be cut and supplied economically in slabs as thin as 1½ in.

At Right:

Buffalo City Hall, Buffalo, N. Y.
DIETEL & WADE and SULLIVAN W. JONES, Architects
Alberene Spandrels used

Newark and Essex Bank Building, Newark, N. J.
JOHN H. & WILSON C. ELY, Architects
Alberene Spandrels used



Alberene Spandrels, School of Education, New York University, New York, N. Y.
JAMES GAMBLE ROGERS, Architect

AMERICAN BLUE STONE COMPANY

Sole Producers of Genuine Genesee Valley Blue Stone

SALES OFFICES
101 Park Avenue, NEW YORK, N. Y.
QUARRIES AND MILLS: AMBLUCO, WYOMING CO., N. Y.

Products

GENESEE VALLEY BLUE STONE, a New York State blue stone from deep hard deposits for architectural exterior and interior building construction.

NATURCLEFT FLAGGING for Garden Walks, etc.

For AMBLUCO Non-slip Treads, Landings, Flooring, Thresholds and Wall Base for interior and semi-interior uses, see Manufacturers' Index.

Facilities

This company was organized and opened its first quarry in 1899. Later it purchased the Genesee Valley Blue Stone Company's property of about 200 acres and extensively developed the quarries which had been in operation since 1868 at what is now Ambluco, Wyoming County, N. Y. The blue stone is taken out to a depth of 100 ft. from the top of the ground.

Mills and yards are equipped with the most modern machinery so that large volumes of business can be shipped without delay. Sawed stock can be easily finished up by local cut stone contractors.

Genesee Valley Blue Stone

Color and Texture—A distinctive uniform shade of light blue, blending well with adjacent light colored surfaces, or giving a sharp clean contrast with dark materials. It is of a fine grain and even texture, being made up mostly of pure hard quartz as shown below.

MINERALOGICALLY CONSIDERED

Fine hard sand, mostly quartz	70%
Clay, as binding material	28%
Water	2%

In this blue stone, quartz, the essential constituent, being harder than the accessory minerals, is pre-eminent on the wearing surface, which makes the stone slip-proof and very durable.

Strength, Weight and Fire Resistance—Few, if any, stones have a greater crushing and transverse strength than this blue stone. Likewise, the stone has high tensile and shearing strengths.

The following table gives its crushing strength, as compiled from tests made by the United States Ordnance Department:

CRUSHING STRENGTH

Rockport granite (Kidder's Hand Book)	17,750 lb. per sq. in.
Vermont marble	Average 13,500 lb. per sq. in.
Genesee Valley blue stone	19,970 lb. per sq. in.

Although of great density it weighs only approximately 150 lb. per cu. ft. when cut ready to set.

It offers great resistance to extreme heat, and the dielectric strength test is among the highest of all natural stones.

Durability—Specimens of this blue stone have been critically and carefully analyzed by eminent mineralogists and pronounced one of the most durable of all stones. In abrasive tests it excels most other stones. Like all stones, it should be cut to set on its natural bed.

It is said by one who has been in the business all of his life and who has made careful study of the stone edifices in Europe, that this Genesee Valley Blue Stone is very much the same as the stone in the architecturally famous stairway of the court in the Bargello Palace, Florence, Italy.

CHEMICAL ANALYSIS

Silica	76.50%
Alumina	14.75%
Oxide of iron	6.35%
Water	2.00%
	99.60%

Adaptability—This blue stone has substantially all the good qualifications of the old genuine North River blue stone which has practically been out of the market since 1912, and has several advantages over such blue stones of the reedy rock character. Genesee Valley Blue Stone is a liver rock and does not produce natural split flagging and curbing. The sheets of stone in these AMBLUCO quarries, being of unusually low levels, represent early deposits and are, therefore, much harder and more compact than stone quarried from higher levels. The quarry blocks are from 2 to 4 ft. thick, permitting ashlar and base courses to be set on the natural bed with face against the grain, which condition rarely or never exists with other blue stones.

Cutter and Sawed Face Ashlar

Even more artistically effective than seam face granite, cutter face (vertical seam face) blue stone ashlar has been worked into buildings of the early American farm house and English Tudor styles. The cutter faces are permanently and beautifully stained many colors and soft shades, producing an old tapestry design when laid random. Also the combination of sand sawed and shot-sawed faces furnishes a pleasing relief from the smooth planed and rubbed finishes.

Foundation Beds, etc.

Genesee Valley Blue Stone is unexcelled for engine, motor, pump, etc., foundation caps. It is also especially good for shelves and uprights of underground vaults. Garden seats and sundials are frequently made of it.

Specification Suggestions for Exterior Use

It is essential that Genesee Valley Blue Stone be specified, and better to guard against the substitution of inferior blue stones, mention this company's name and address as producers.

Specifications should require all blue stone (as well as most other stones) to be thoroughly seasoned and to be cut so as to set on its natural bed, especially when used for grade courses.

The practical finishes, in order of their costs are: Sand sawed; shot sawed; rock face; wet sand rubbed; fine axed (6-cut); horizontally (machined) tooled; and vertically (hand) tooled. This blue stone also takes most any finish applied to a natural stone. The sand sawed finish, showing no saw marks, is very uniform and brings out the character of the stone. This is produced by a slow process and does not burn and bruise the surface of a stone as does planing and axing.

Naturcleft Flagging

A natural split flagstone of definitely known qualities from the finest quarries in Pennsylvania. Its many soft mellow color tones are unequalled by any other similar material. Specify Naturcleft Flagging as furnished by the AMERICAN BLUE STONE COMPANY, New York, N. Y., and be sure to get the genuine.

Co-operative Service

Our organization, through its members' lifelong experience with blue stone, offers its knowledge in an impartial manner, unbiased by thought of personal profit.

THE TAYLOR STONE COMPANY

Quarrymen and Fabricators of Harvest Hill and Sciota Sandstone

McDERMOTT, OHIO

Harvest Hill Sandstone

Harvest Hill Golden Grain Sandstone is furnished in rough blocks, sawed, split ashlar, or cut ready-to-set, as per plans and specifications. It is suitable for both interior and exterior use in buildings of every class. Obtainable in any desired dimension and a variety of finishes. Non-staining from ordinary Portland cements.

Color Classifications

(See illustrations on facing page)

Golden Buff Variegated—Has a predominating golden buff base with pronounced stripes, splotches and speckled markings of darker hue.

Royal Silver Marbled—Has base of radiant light silvery gray with beautiful markings of tan, buff and brown, giving it a marbled effect.

Bronzed Pink Mottled—The base is a rich golden buff with a decided pink tinge and big splotches of reddish brown, producing an effect of imported tapestry.

These color classifications have been established to assist the architect and builder in the selection of a GENERAL color scheme. Practically every glowing color of the harvest season has been deposited by Nature in this highly variegated, distinctive material. Certainly, in few other stones can be found the flare and subtlety, the richness and warmth of its wonderful color range.

Durability, Physical and Visual

The illustration on this page is of only one of the many buildings constructed of this stone 50 to 75 years ago, which stand today in a state of perfect preservation, silently attesting the unquestionable durability of the texture and color of Harvest Hill Sandstone.

Quarry and Mill Facilities

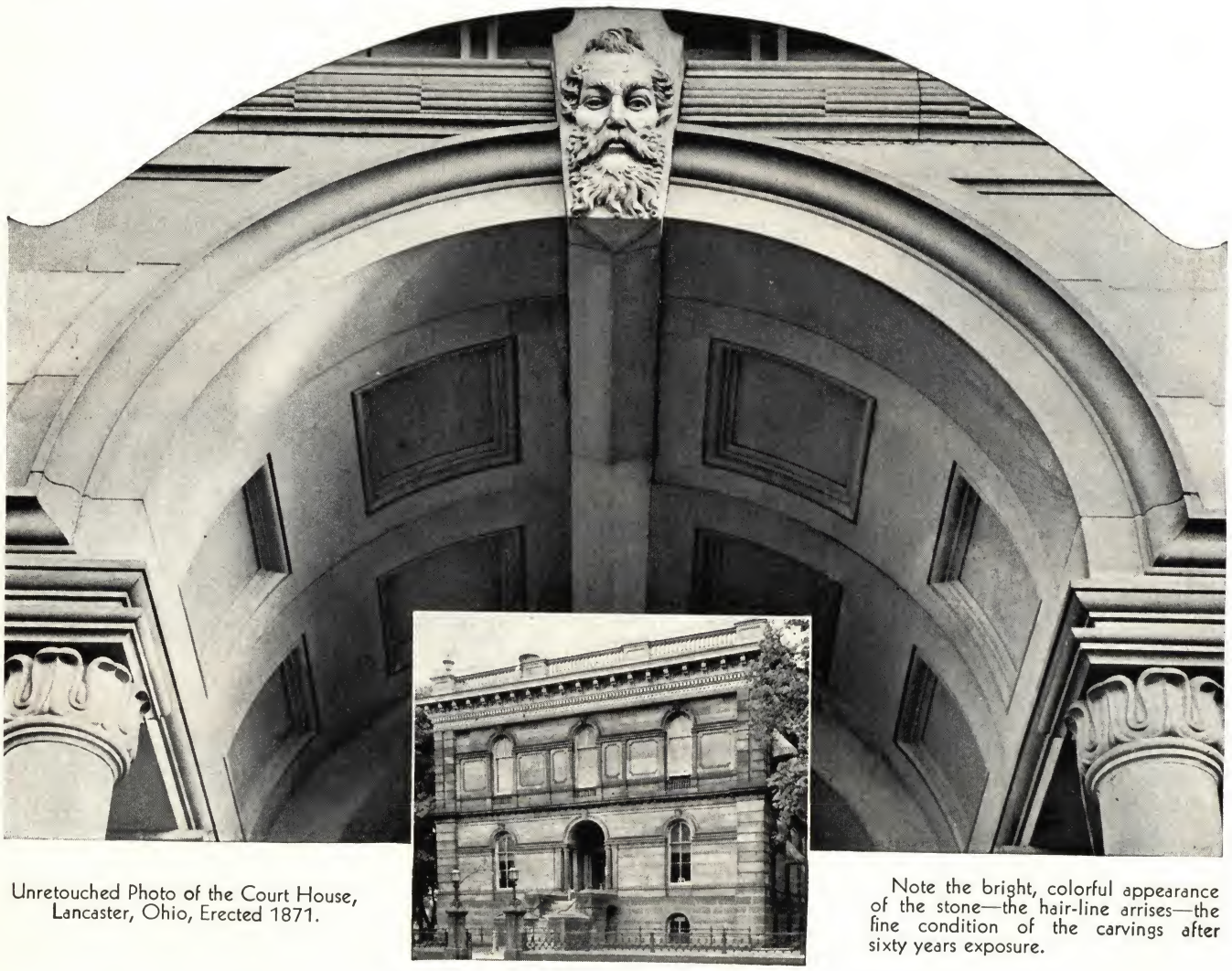
Produced at our Lancaster, Ohio, quarry where the supply is practically unlimited, insuring uninterrupted operations for hundreds of years to come. Fabricated at McDermott, Ohio, in one of the country's largest mills. Modern machinery, experienced employees and a capable organization, assure quality workmanship and service on jobs of any size.

Specification

"Harvest Hill Golden Buff Variegated (Royal Silver Marbled) (Bronzed Pink Mottled) (Full Color Range) as produced by The TAYLOR STONE COMPANY, McDermott, Ohio."

Samples, Tests and Service

Samples of any special size or finish, complete report of tests covering physical and chemical analysis and special architectural service will be gladly furnished upon request and without obligation.



Unretouched Photo of the Court House, Lancaster, Ohio, Erected 1871.

Note the bright, colorful appearance of the stone—the hair-line arrises—the fine condition of the carvings after sixty years exposure.

HARVEST HILL—GOLDEN BUFF VARIEGATED

HARVEST HILL—ROYAL SILVER MARBLED

HARVEST HILL—BRONZED PINK MOTTLED

SCIOTA STONE
DENSE STRONG COLORFUL

Albany Ave. Bridge—Atlantic City. A. H. Nelson—Supr. Engineer. Piers and operators' houses "Sciota" Pearl Gray stone.

Sciota Sandstone

Sciota Sandstone is a dense, hard, strong stone of uniform structure, obtainable in the rough block, sawed, split ashlar, flagging, or cut ready-to-set, as per plans and specifications.

Because of its great strength, Sciota Sandstone may be sawed very thin and used economically for interior ashlar construction. Its fine wearing quality makes it particularly adaptable for multiple book stack flooring, step treads, landings and window stools. Its adaptability to any design of ventilating and drainage system, its great strength, low cost and ease of installation, make it one of the best materials for community mausoleum crypt construction. Because of its great strength and low cost, it is an ideal stone for bridge construction. Its pleasing colors harmonize nicely with other exterior building materials, making it a desirable stone for general exterior trim. It is a very practical stone for spandrels. Because of its uniform, fine grained structure, it works freely and carves beautifully.

Heavenly Rest Church—New York City. Goodhue Assos.—Architects. Geo. Brown & Son—Cut Stone Contr. "Sciota" warm toned Buff stone used exclusively for interior construction.

Higgins Estate—Indianapolis, Ind. D. B. Johnson—Landscape Archt. Flagstone—steps—seats "Sciota" sawed and rustic stone.

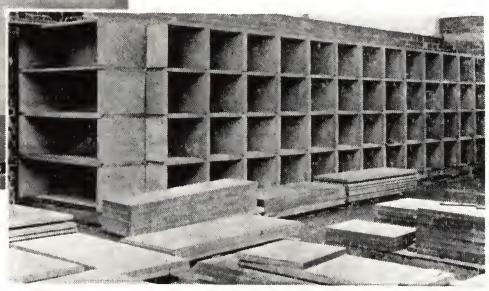
Color—Sciota Sandstone ranges in color from a blue or pearly gray, to a deep golden buff, the color classification being designated as Pearl Gray (Blue), Buff, Gray (Gray-Buff) and Tammany. The latter stone is so named because of its pronounced and distinctive stripes.

Analysis—Silica 88.5%; alumina 5.9%; iron oxide 1.7%; moisture 2.1%; magnesia and lime, traces; absorption 3.62%; crushing strength 10,500 lbs. per sq. in.

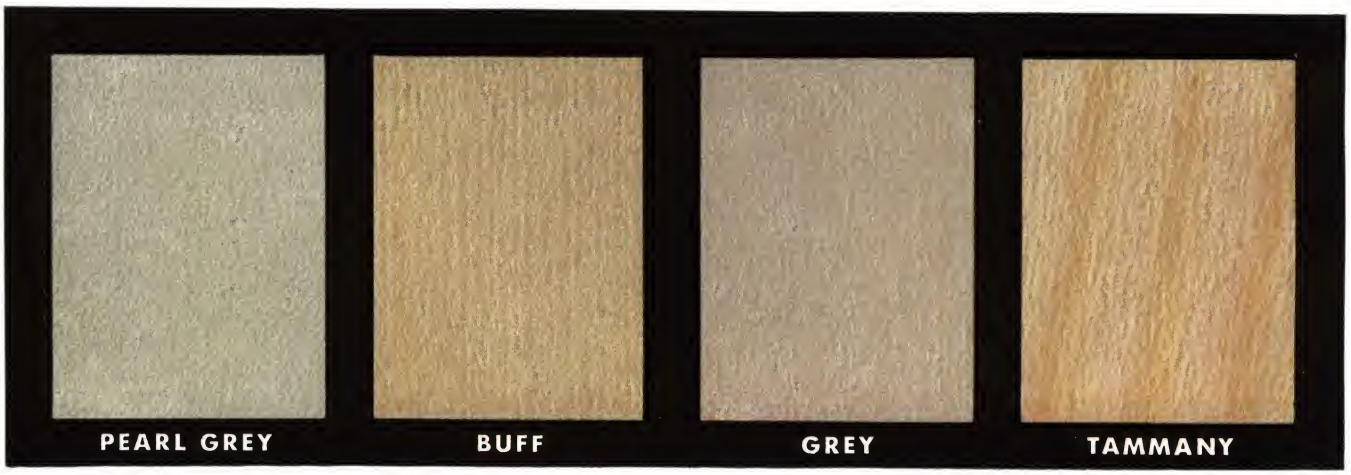
Quarry and Mill Facilities—A vast quarry insures an unlimited supply of stone for hundreds of years. Our mill is one of the country's largest and is equipped with every modern facility.

Specification—"Cut stone shall be Sciota Stone as produced by THE TAYLOR STONE COMPANY, McDermott, Ohio, or equal. It shall be a dense, hard, close grained sand stone of Buff (Pearl Gray)(Gray)(Tammany) color. It shall be free from stains, dull marks, loose grains, checks, seams or other defects that might impair its strength or detract from its appearance. It shall have a crushing strength of not less than 10,000 lbs. per sq. in."

One of the many installations of "Sciota" stone flooring, steps and wainscot in Bell Telephone Co. Buildings.



Mausoleum—Canton, Ohio. McClain Bros.—Archts.-Bldrs "Sciota" stone crypt construction.



THE BRIAR HILL STONE CO.

Golden Buff and Variegated Sandstone; Golden Tone Ashlar Wall Facing

GLENMONT, OHIO

Briar Hill Golden Tone Sandstone

Briar Hill Golden Tone Sandstone—rough blocks, semi-finished, ashlar, stone-brick, or cut and carved ready to set in accordance with plans and specifications.

Readily available in practically any locality.

Varieties—Golden buff, variegated in either light or dark shades, and "run of quarry" which comprises all colors. Each hue is tinged with an exquisite, subdued golden tone. Variegations consist of banded, mottled, speckled and clouded markings in an infinite variety of patterns and combinations. For this reason it is practical to select for color only in a very general way.

Adaptability—Suitable for all classes of buildings, both for interiors and exteriors; effective as trim for seam face granite, field stone, brick or stucco, and especially adapted to gothic architecture, because of its easy working qualities.

Durability—Briar Hill Sandstone is permanent in texture and color. Positive proof of this is offered by an old church at Glenmont, cornerstone of which is shown on next page. Built of stone from this quarry in 1857, the original tool marks remain clean cut and sound. Age merely mellows the beauty of this colorful stone.

Physical and Chemical Properties—Results of physical and chemical analyses, compression, freezing and absorption tests gladly furnished on request.

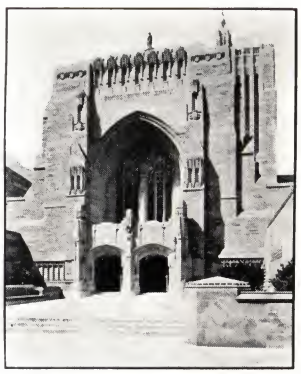
Quarry—Our vast quarry holdings insure a practically unlimited supply of this stone.

Facilities—Our quarries and mill are thoroughly equipped with modern machinery, capable of handling any size project. Prompt, efficient execution of contracts assured at all times.

Price—Although distinctive and yielding infinite color resources to the architect's skill, Briar Hill Stone is reasonable in cost. It is, therefore, economically available for all classes of buildings.

Briar Hill Golden Buff

Briar Hill Variegated (lighter shades)



Entrance Detail—
Sterling Memorial Library
Yale University
JAMES GAMBLE ROGERS, ARCHITECT

Briar Hill Variegated (darker shades)

San Diego Trust & Savings Bank, San Diego, Calif.
WM. TEMPLETON JOHNSON, ARCHITECT

Color Illustrations about 1/6 actual size

Dayton Art Institute
Dayton, Ohio
EDWARD B. GREEN & SONS AND ALBERT HART HOPKINS, ARCHITECTS

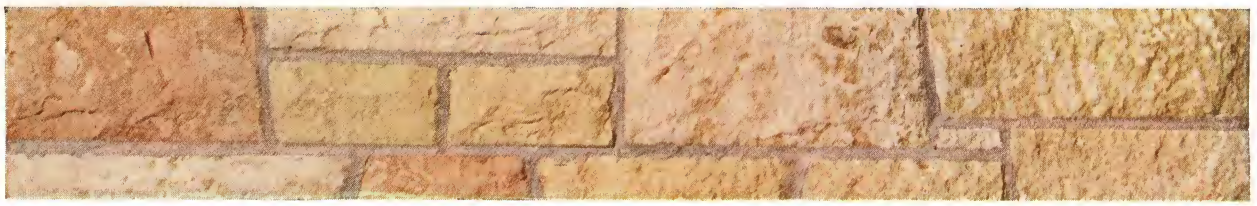
Edsel Ford Residence, Gaukler Pointe, Mich.
ALBERT KAHN, INC., ARCHITECT

Immaculate Conception Church, Waterbury, Conn.
MAGINNIS & WALSH, ARCHITECTS

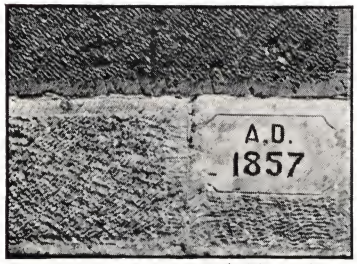
Payne Whitney Gymnasium, Yale University
JOHN RUSSELL POPE, ARCHITECT

Temple Beth Israel, Portland, Ore.
MORRIS H. WHITEHOUSE & HERMAN BROOKMAN, ASSOCIATE ARCHITECTS

Briar Hill Ashlar Adds Charming Individuality to Every Home



E. S. Warner Residence
Shaker Heights, Ohio
CHAS. R. GRECO, ARCHITECT.
EDWARD G. REED, ASSOCIATED



Cornerstone, Old Church
Glenmont, Ohio
Original tool marks remain clean cut and sound

NOW this virgin stone with its warm, friendly tones can be employed as exterior Ashlar Wall Facing. Usually furnished four inches thick, to give each home a well-built appearance at very reasonable cost. Its diversity of fine surface textures, rich variety of blending tints, convenient random lengths and variable course heights, offer a gloriously wide range for original and exclusive effects. It can be rapidly cut and laid in many charming effects by stonemasons or bricklayers without requiring any predetermined pattern. To harmonize with each type of architecture, this stone is available in sand, shot sawed, and split-faced finishes or textures.

Old Buildings Can Be Modernized in Appearance with *Colorful* Natural Stone—*at Moderate Cost*

Briar Hill Golden Tone Ashlar is also economically available everywhere for modernizing, renewing the youthful appearance of aged structures—as well as individualizing new ones—simply by covering the old exterior with this colorful stone facing four inches thick.

Architects Invited to Write for this Free Ashlar Booklet

Our new Ashlar Wall Facing Booklet illustrates numerous Briar Hill houses, pictures the stone in its own lovely coloring and contains many valuable suggestions. A copy will be sent to any architect for the asking. We will gladly estimate the cost of your buildings—individualized or modernized—with Briar Hill Golden Tone Sandstone. Just send us your blueprints—no cost or obligation.

CRAB ORCHARD STONE CO.

INCORPORATED

NASHVILLE, TENN.

JOHN OMAN, JR., President

CRAB ORCHARD QUARTZITE

"One of Nature's Most Beautiful Materials"

A building stone, everlasting as granite, with wide chromatic range. Practically a recent discovery among nature's treasure deposits.

Quartzite lies in separate strata ½ to 22 ins. in thickness. The thicker material is quarried into dimension stone and rubble. Write for details.

IN TONE, TEXTURE AND PERMANENCY, A MEDIUM WORTHY OF THE ARCHITECT'S VISION

In rich color variety and pleasing texture Crab Orchard Quartzite creates a new architectural vision.

Harmonizing intermediate autumnal tones, rich and charming as those of Old World Latin Tiles—together with its fine grain and impervious density—afford to modern construction full play of the highest artistic expression.

Flagging, treads, roofing, coping, stepping stones and such building accessories are obtained from the thinner ledges. Furnished from our five quarries promptly in any dimensions up to transportation limits.

While our quarries produce a wonderful variety of colors—less brilliant, quiet tones can be furnished when desired.

Special Decorations and Designs

Crab Orchard Stone is well adapted for sand blast process in the execution of intaglio or sunken relief designs and reredos altar pieces and chancel furnishings.

For special decorations and designs write

STONECRAFT, INC.
Rockport, Illinois

SAMPLES OF STONE SENT ON REQUEST

THREE OUTSTANDING FEATURES OF CRAB ORCHARD QUARTZITE

Wide Chromatic Range

Pleasing Texture

Great Durability

Special Decorations and Designs Made to Specifications

A very beautiful material lending itself to a wide variety of uses. Its fine grain, impervious density and remarkably true surface make it especially well suited for roofing, coping, exterior and interior wall surfaces, wainscoting, floors, treads, flagging and stepping stones.

Specified by many of the best architects for the construction of buildings of outstanding character.

A Few of the Notable Structures in Which Crab Orchard Quartzite Has Been Employed

Building and Location	Architect
Academy of Arts, Honolulu, H. I.	Mayers, Murray & Phillip
Church of Heavenly Rest, New York, N. Y.	Mayers, Murray & Phillip
Lucian H. Tyng Group, Southampton Beach, N. Y.	Peabody, Wilson & Brown
Harkness Memorial Dormitories, Cambridge, Mass.	Coolidge, Shepley, Bullfinch & Abbott
St. Paul's Episcopal Church, Winston-Salem, N. C.	Cram & Ferguson Harold Macklin
Beard Residence, Tuxedo, N. Y.	McKim, Mead & White
Georgia School of Technology, Aviation Building, Atlanta, Ga.	Bush, Brown & Gailey
William H. Schuchardt, Residence, Los Angeles, Calif.	William H. Schuchardt
Cleveland Heights Bank, Cleveland, Ohio.	Andrew J. Thomas
Legal Research Building, University of Michigan, Ann Arbor, Mich.	York & Sawyer
D. B. Phillips Residence, Butler, Pa.	Janssen & Cocken
Internal Revenue Building, Washington, D. C.	James A. Wetmore (Supervising)
Cathedral of the Queen of the Holy Rosary, Toledo, Ohio	William Richard Perry

In addition to the colorings shown we are able to supply subdued tones of gray and tans, and to ship promptly in sizes up to transportation limits. Our Crab Orchard Quartzite lies in the quarry in separate strata ½ to 22 ins. in thickness. The thicker material is used for dimension stone and rubble. Write for complete information.

CRAB ORCHARD *Quartzite*

SAMPLES OF STONE SENT ON REQUEST

CLOSTER STONE QUARRIES, INC.

ENGLEWOOD, N. J.

OFFICES AND SHOWROOMS

NEW YORK, N. Y., 101 Park Avenue, A. V. Jones

Closter Stone—The Stone of Character

For the finer residences, churches, schools and institutions Closter Stone is ideal in every respect.

It is a stone of dignity and superior quality, being hard and durable, while of free, even grain and easy cleavage which results in labor economy.

Closter stone is available in a variety of colors: warm pastel shades, salmon, light pink, rust, light buff, light grays and heather browns.

Furnished in all heights and lengths; may be used for setting varying patterns in straight courses, broken or random ashlar. It is highly desirable in garden or landscape work for walls, coping, steps, water pools, etc.

Closter Stone possesses remarkably low moisture absorption qualities and high compressive strength. It is recommended for its impenetrability to storms and its longevity.

Samples of Closter Stone will be furnished to architects upon request. Quotations from plans gladly furnished for any project. Setting estimates also submitted on request.

Facilities and Supply

The plant is equipped with up-to-date quarrying and dressing machinery, rendering adequate despatch in production. Advantageous shipping location convenient to transportation centers, means speedy handling of the finished stone. We provide truck delivery within 100 miles of the metropolitan district.

Recent Installations

Dennison Residence, Saddle River, N. J.
Aymer Embury, 2nd, Architect, New York, N. Y.
Presbyterian Church, Englewood, N. J.
Hobart Upjohn, Architect, New York, N. Y.
St. Cecelia Auditorium and High School, Englewood, N. J.
Raphael Hume, Architect, New York, N. Y.
St. Cecelia Priory, Englewood, N. J.
Neil Convery, Architect, Newark, N. J.
First National Bank, Westwood, N. J.
Demarest Motors Building, Ridgewood, N. J.
Robert J. Jahelka, Architect, New York, N. Y.

THE DEXTONE COMPANY

THE DECORATIVE STONE CO. (CONSOLIDATED 1930) THE ECONOMY CONCRETE CO.

Producers of Cast Stone

NEW HAVEN, CONN.

NEW YORK OFFICE: 101 Park Avenue

PHILADELPHIA OFFICE: 238 Cherry Street

Product—Dextone

A cast building stone of high strength and durability for the treatment of masonry buildings of all types.

Great variety of colors and surface textures, tooled, plain, sawed, polished or otherwise textured as desired.

Extensively used for schools, churches, banks and buildings of monumental character.

The service of our experimental laboratory is available to architects for the development of special color and texture effects.

The Company Offices

The Company

THE DEXTONE COMPANY is a consolidation, effected in 1930, of The Decorative Stone Company and The Economy Concrete Company of New Haven, Conn. Both were pioneers in the development and manufacture of cast stone and bring to the industry a combined experience of over 45 years. The consolidation now operates the largest and most adequately equipped plant of its kind in the country with a capacity of 35,000 cu. ft. per month.

METHODS USED IN PRODUCING DEXTONE

Importance of Sizing and Proportioning Aggregates

In making cast stone where the aggregate will be uniformly distributed throughout its entire mass, it is necessary to separate the sizes and reproportion them so that the proper amount of each size is used in each mix.

The illustration shows the various sizes of aggregate which are used in the manufacture of Dextone. A battery of electrically vibrated screens makes it possible to use the exact amount of each size necessary to form a uniformly dense mixture. By means of this scientific proportioning the voids are reduced to a minimum and the stone materially strengthened.

The use of crusher-run aggregate should never be permitted. Where crusher-run (ungraded) aggregates are used it is not possible to obtain the uniform density and hardness which is a characteristic of Dextone.

Note: A large percentage of dust (60-mesh and under) is found in all crusher-run aggregates. Manufacturers without screening facilities are, of course, unable to separate out this undesirable size.

Fig. (1) Coarse
Suitable for mixtures where granite effect is desired. Stones in which this size is used show marked increase in strength

Fig. (2) Standard
The body aggregate of all standard mixes, the smallest coarse aggregate allowable in any full strength cast stone

Fig. (3) Fine
A clean, sharp, fine aggregate which gives the mixture necessary workability. It is sized to close limits

Fig. (4) Dust
Worthless as an aggregate and unsuitable for any full-strength cast stone. None of this size is used in the composition of Dextone

REPRESENTATIVE SAMPLES OF DEXTONE

DEXTONE 65 O. R. MATT RUBBED

A variegated color effect, pigments are integral and are non-fading. The surface texture illustrated develops the effect to best advantage.

DEXTONE 1050 BUSH HAMMERED

Colors produced in various tints of pink, buffand gray.

DEXTONE 652 MATT RUBBED

A semi-smooth finish, suitable for work where a pronounced textured effect is not desired.

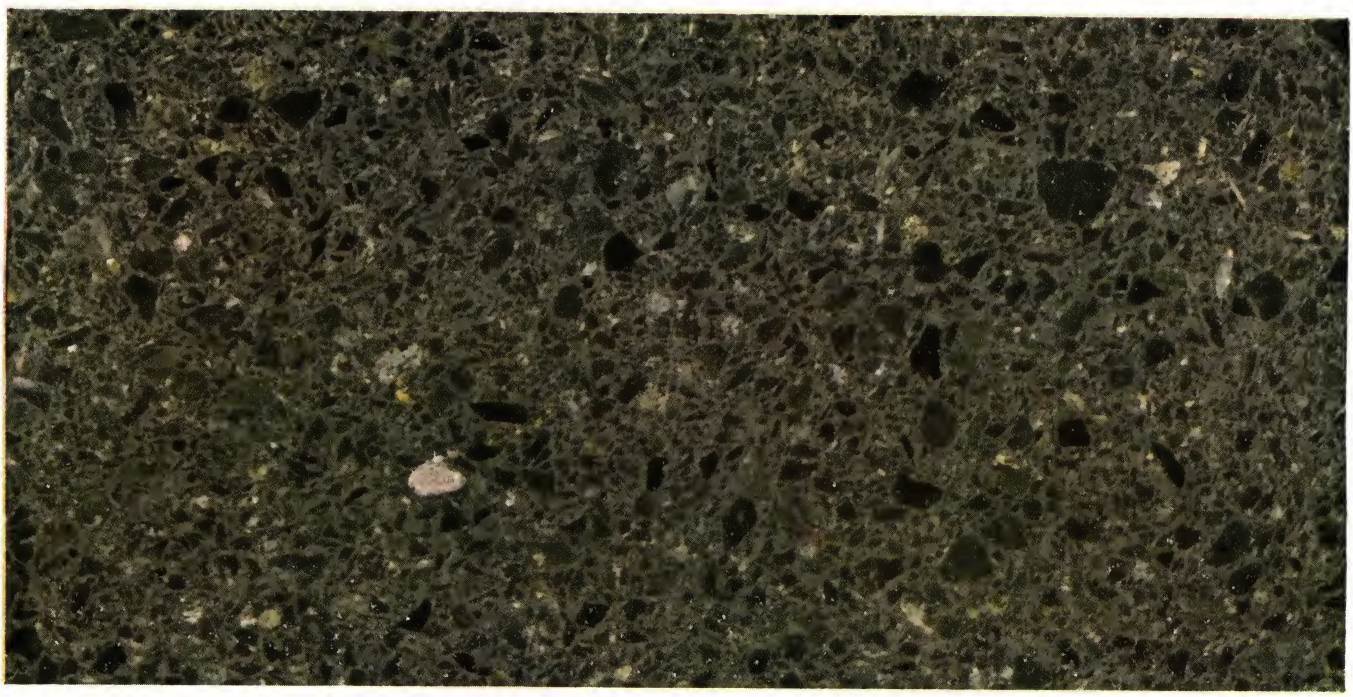
Continued on next page

REPRESENTATIVE SAMPLES OF DEXTONE

Dextolite is a special process cast stone made of colored marble and granite aggregates and non-fading pigments. Its high gloss polish emphasizes its natural color. Generally made in 4″ slabs but can be reduced in thickness if desired.

DEXTOLITE 1742 POLISHED

Century Apartments, 62nd St. and Central Park West, New York City, is a notable installation of this material.



DEXTOLITE 2600 POLISHED

Continued on next page

Privately Operated Quarry

Sized aggregates are produced at our own privately operated quarry. It is maintained for the sole purpose of making aggregates of sizes and degree of accuracy which are best suited for cast stone manufacture. In quarries where these materials are made as a by-product these ideal sizes are compromised in favor of other products. Our crushers and electrical vibrator screens are of the most modern and efficient type. The stone itself was selected because of its hardness and durability. It is grayish white in color and of sparkling crystal formation.

Dextone Is Cast in Sand Moulds

By this method any excess water is immediately taken up in sand and, within a few moments after casting, a mixture is in place in which water content has been reduced to a minimum without having lost, until that time, its workability. This conforms to the best practice recommended by the American Concrete Institute.

Importance of Control in Water Content and Weight of Aggregate

Accurate control of the amount of water used is an important factor in obtaining hardness and density in cast stone. In the production of Dextone, the water cement ratio for each mix is carefully controlled. Proper equipment and proper supervision in this step is vital to the excellence of the finished product. All aggregate is measured by weight, thus eliminating the usual fluctuations caused by volume changes occurring from moisture content in aggregates. When aggregate is measured by volume, instead of by weight, the fluctuation is often as high as 40%. Note in the color plates the perfect distribution of the aggregate as a result of this water and weight control. This experience and care is typical of the precise methods employed in the production of Dextone.

Facts to Be Considered When Specifying Cast Stone

The essential points to cover in a specification for cast stone are as follows:

(1) Aggregates must be sized by screening and proportioned to produce maximum density. Crusher-run aggregates not to be used.

(2) Minimum 5000 lbs. compression. Minimum 3%, maximum 7%, absorption.

(3) Must be made by the wet-poured process and in sand moulds.

(4) Stone must be of the same composition throughout.

(5) Mixed materials must be constantly agitated until placed.

(6) Specify method of setting carefully.

(7) Quotations to be based on Dextone—manufactured by THE DEXTONE COMPANY, New Haven, Conn. (Insert color and finish desired.)

Note: Complete architect's working specifications covering manufacture and setting of any first quality cast stone are made up for your convenience and will be mailed on request.

The following pages illustrate a few of the important operations most necessary in the manufacture of cast stone of the highest quality.

THE DEXTONE ORGANIZATION

Sales

The sales organization is made up of technically trained men who thoroughly understand the use and cost of Dextone. These men can render a genuine service in specification writing, selection of stone and in the best and most economical use of Dextone.

Drafting

Drawings of your stone job will be refreshingly clear and exact. Your design will be carefully and sympathetically developed. Special anchorage, unusual flashing problems, load bearing stones requiring special reinforcing will all come to you detailed at large scale and correctly designed. A practicing architect is retained to advise in all matters of design.

Models

Experienced architectural modelers are in the regular employ of the Dextone organization. Architects are urged to visit the studio during the preparation of models to better convey their intention to the modeler. After casting, all modeled work is carved by skillful stone carvers and under the supervision of the modeler.

Laboratory

Constant testing of all materials used in the manufacture of Dextone is only one of the precautions taken to make it the best. This department is always ready to work with architects to develop some special aggregate or color effect which may be desired. Strength and absorption tests are conducted at regular intervals to guarantee that Dextone is meeting all requirements.

Servicing and Expediting Department

As soon as a contract is made this department is acquainted with all agreements and delivery schedules made by the salesmen. Their business is to expedite the work through all detailing and manufacturing processes to assure these deliveries being made. The contractor is kept informed as to progress at all times.

Supplementing this department an outside job service is maintained to make closer contact with the actual job. This service includes a check-up of job conditions, advice in matters of handling, setting, mortar, equipment, repairs and anything to protect the interest of the job. Architects are requested to make use of these men. A letter to the Company is sufficient. When so requested detail reports will be made to the architect. No charge is made for this service.

Plant Inspection

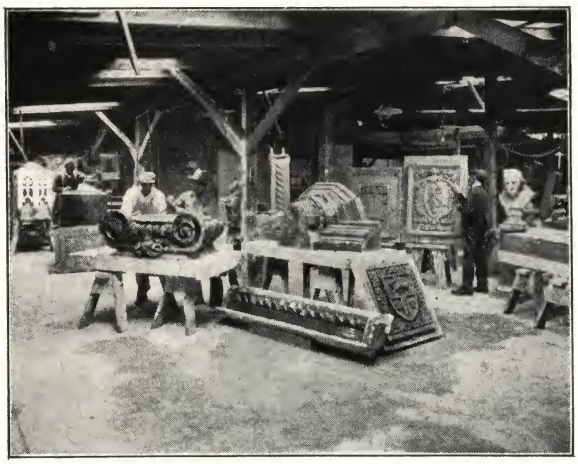
Architects and contractors are invited to visit the plant in company with their clients to inspect the complete facilities which are maintained.

MANUFACTURING PROCESSES

An idea of the extensive plant and equipment and the numerous operations required in the manufacture of Dextone may be gained from these illustrations.

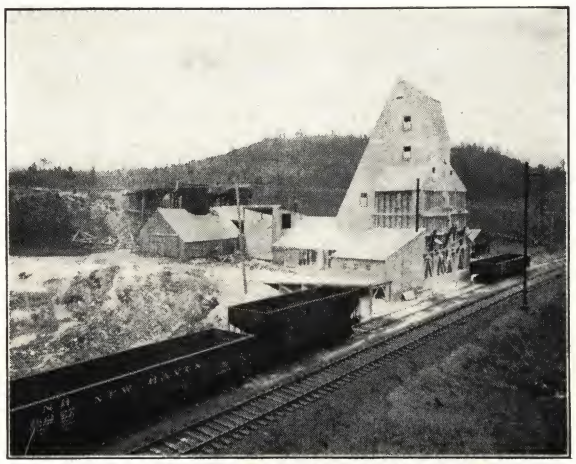
Improvements, both in the facilities and the product, are continually being introduced. Individual judgment has, in the majority of operations, been replaced by established modern practices.

Architects and builders are invited to visit the premises with their clients. An officer of the Company will accompany you and explain the processes, and their relation to your individual problem, in detail.



Studio and Plaster Shop

A regular staff of architectural sculptors is maintained. After models are cast in stone they are subsequently carved under the direction of this department

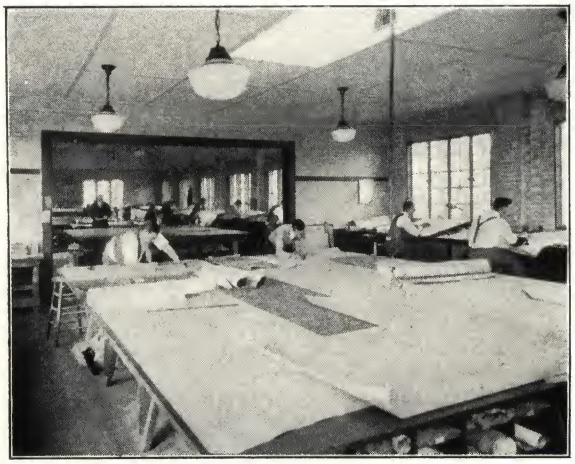


Crushing and Screening Plant, Redding, Conn.

This plant is located at the quarry site and produces aggregate solely for our own purposes. Equipped throughout with modern heavy duty machinery for economical production far in excess of present requirements

Pattern Shop

Every stone is made in the form of a wooden pattern precisely reproducing the architect's detail. The sections are checked carefully with the full size details, allowing a maximum tolerance of $\frac{1}{64}$ in.



Engineering and Drafting Department

In addition to making regular shop drawings, all sections, mouldings, arches, doorways, tracery windows, etc., are laid out at full size. This is a highly specialized department and requires specially trained men

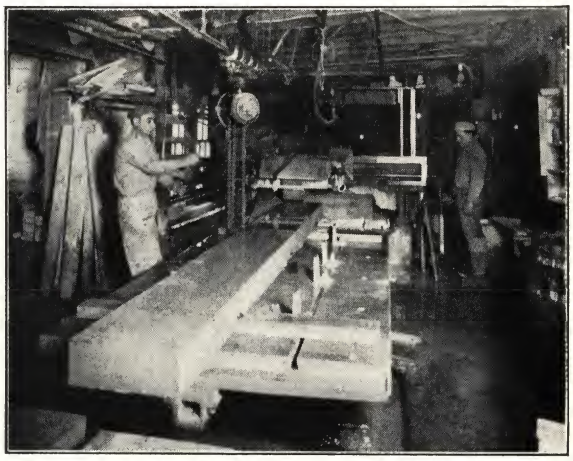
Casting Shop

Each mould is inspected for steel reinforcing, anchor slots, lifting rings, and mixture number before it is filled. The temperature and moisture content of these beds are controlled at all times

MANUFACTURING PROCESSES

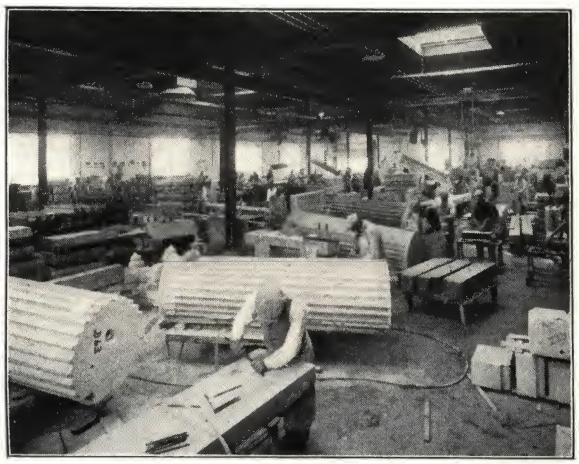
Electrical Agitator

Mixed materials are conveyed from the central mixing plant to the moulds in this agitator. The mixing operation is continued until the material is placed in the mould



Carborundum Planer

This is one of the several specially built machines which are used for making straight cuts on either moulded or flat surfaces. On moulded work the carborundum wheels are shaped in reverse to the required moulding. It is one of the facilities which Dextone offers at but a slight increase in cost

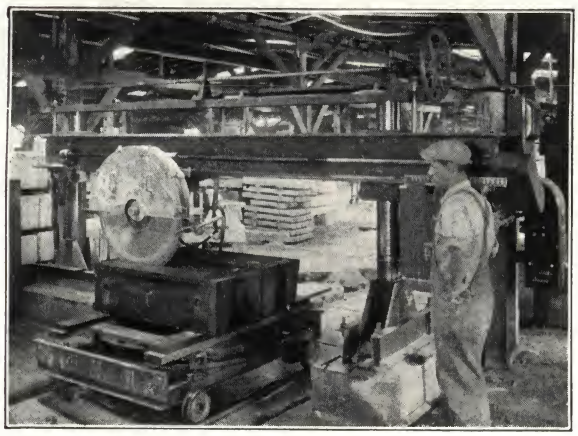


Finishing and Stone Cutting

Note that all operations are carried on in well-lighted, heated buildings. Each department is under the supervision of a trained foreman. A final inspection of each stone is made before it leaves this department

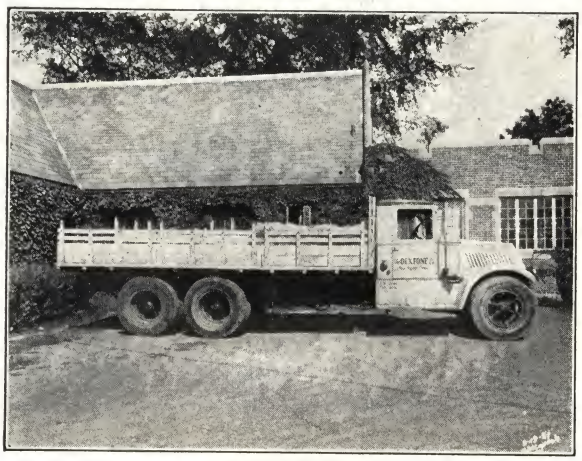
Polishing Machine

This machine is used after the process of cutting by planer has been performed. Cutting heads of different degrees of fineness are used to secure honed or polished surface as desired



Carborundum Saw

The results obtained on this machine illustrate particularly well the difference between ordinary cast stone and cut cast stone. It will cut with equal facility a ¼-in. groove or a depth of 12 in.



Trucking Facilities

One of the fleet operated by this Company. Note the specially constructed chassis enabling these trucks to carry a 15-ton load at high speed

THE DEXTONE LABORATORY

Since its inception THE DEXTONE COMPANY has taken an advanced position in all matters pertaining to the quality of its product. One of its most important steps in this direction has been the establishing of a technical laboratory whose principal function is the conducting of a line of independent research. This Company is the first in this industry to undertake an extensive research program of this nature.

A secondary function, but of no less importance, is the testing of the run of production.

The work of this department is under the personal direction of a technical expert in collaboration with a member of the faculty of Sheffield Scientific School, Yale University.

As an indication of the scope of the independent research being conducted, we cite a few of the most important:

(1) Determination of merits of various standard brands of cement.

(2) Investigation of effect on aggregate sizes and combinations.

(3) Investigation of effect of time of mixing and type of mixers.

(4) Investigation of effect of time and condition of curing.

(5) Investigation of effect of temperature, moisture content and character of sand moulds.

(6) Investigation of admixtures.

The run of production is tested at regular intervals for compression, absorption and other properties.

General View of Laboratory

At the extreme background left, suspended from trolley, may be seen the portable mixer which is equipped to operate at variable speeds. In the investigation of this factor, mixing times have been tested ranging from 2 minutes to 3 hours.

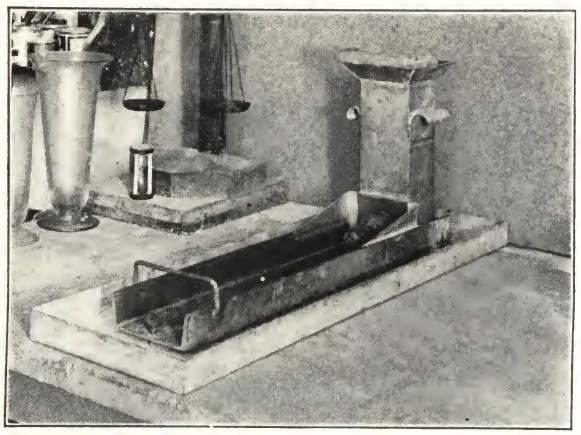
In the middle left foreground note also the vibrating table (octagonal) on which countless specimens are being manufactured and tested, determining the most desirable type of vibrator, severity of vibration and period of vibration.

At the rear right is the steam compression chamber in which examination of the claims which are being made for steam curing are now under observation.

At the right is shown the apparatus by which the aggregates are aerated and reduced to a constant water content.

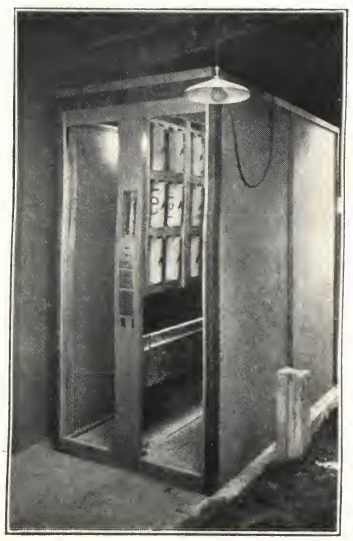
Test Rack

A portion of the specimen rack in which samples are stored in preparation for subsequent tests and measurements is shown at the left. Every factor which might in any way influence the results of tests is known and controlled.



Flow Meter

Workability is a term in wide current use in reference to concrete mixtures. Various instruments have been devised by which this property can be measured. The device illustrated above was developed in the Dextone Laboratory to meet our own peculiar requirements. It is used both by the laboratory and in the control of production at the central mixing plant.



Constant Temperature Room

In making certain measurements it becomes necessary to eliminate the variation of expansion and contraction by heat and cold. In this room (which is shown at the right, with doors removed) the temperature is automatically maintained at an absolutely known point. Measurements are made daily and over long periods of time.

REPRESENTATIVE SAMPLES OF DEXTONE

DEXTONE 4 PLANER CUT

A carborundum machine cut finish made from oversize castings and fully exposed aggregate.

DEXTONE 65 VARITEX 5 F

A fine textured cast stone made by the Varitex process and obtainable in various color combinations.

DEXTONE VARITEX—RXM

Another Dextone product for use where color and texture are paramount, possessing a distinctive irregularity of surface.

Continued on next page

A color photo showing an installation of COTSWOLD ASHLAR in combination with DEXTONE TRIM No. 65 O. R. with random cut surfaces.

Cotswold Ashlar

PATENT APPLIED FOR

Manufactured exclusively by The Dextone Co., New Haven, Conn.

COTSWOLD ASHLAR is a random ashlar possessing the sound structural qualities of all Dextone products. It is manufactured by a newly developed process which allows the free use of a large variety of sizes and bondings. It is made in a number of different color ranges and can readily accommodate any special colors or combinations desired.

Architect's Service

Advisory service covering all phases of its use. Sketches of typical bonding arrangements for use at the job will be supplied if desired. Samples will be supplied for erection at the job to check bondings and colors.

Specification

Face all walls where indicated on plans with COTSWOLD ASHLAR made by THE DEXTONE CO., New Haven, Conn.

Color as selected by the architect.

Bond with 15% stones 8 in. thick. Sizes and bonding arrangement to be selected.

(State if possible in specification whether coursed ashlar, coursed with occasional interruption, or entirely random no coursing.)

Joints ¾ in. Where adjoining cut stone trim ⅜-in. joint.

Setting mortar: 1 part cement, 1 part cold lime putty, 5 parts clean sand.

Joints raked out 1 in. and pointed with 1 part cement, ¼ part cold lime putty and 3 parts sand, colored as required.

REPRESENTATIVE WORK

Larchmont Avenue Church, Larchmont, N. Y. *Photo by Samuel H. Gottsche*
JOHN RUSSELL POPE, Architect
Trimmed with a special Antique Textured Stone

Schools and Colleges

St. Mary's Hall, Boston College, Boston, Mass.
McGinnis & Walsh, Architects
High School, Orange, N. J.
Ernest Sibley, Architect
High School, Port Chester, N. Y.
Tooker & Marsh, Architects
High School, Floral Park, N. Y.
Knappe & Morris, Architects
Hartford Seminary Foundation, 6 buildings, Hartford, Conn.
Allen & Collens, Architects
Junior High School, New Rochelle, N. Y.
Starrett & Van Vleck, Architects
Eastview School, White Plains, N. Y.
Starrett & Van Vleck, Architects
Gymnasium, Princeton University, Princeton, N. J.
Aymar Embury II, Architect
Peabody Museum, Yale University, New Haven, Conn.
Day & Klauder, Architects
Bingham Hall Tower, Yale University, New Haven, Conn.
Walter B. Chambers, Architect
Yale University Theatre, New Haven, Conn.
Blackall, Clapp & Whittemore, Architects
Medical School Group, Yale University, New Haven, Conn.
Henry C. Pelton, Architect
Wheelock Dickinson Dormitory, Yale University, New Haven, Conn.
James Gamble Rogers, Architect
Roosevelt High School, Yonkers, N. Y.
G. Howard Chamberlain, Architect
Hunter College, New York, N. Y.
Thompson, Holmes & Converse, Architects
Central High School, Rye, N. Y.
Woolsey & Chapman, Architects
All Hallows Institute, Bronx, N. Y.
James W. O'Connor, Architect

Banks

First National Bank, Palmerton, Pa.
Ernest Strassle, Architect
Hamden Bank & Trust Co., Hamden, Conn.
Norton & Townsend, Architects

Banks (Continued)

Sunrise National Bank, Baldwin, L. I., N. Y.
H. T. Jeffrey, Architect
Union Center National Bank, Union, N. J.
F. A. Elsasser, Architect
Lodi Trust Co., Lodi, N. J.
Rocker & Strassle, Architects

Churches

St. Paul's Church, Yonkers, N. Y.
Cram & Ferguson, Architects
Presbyterian Church, Bryn Mawr, Pa.
Karcher & Smith, Architects
First M. E. Church, Bridgeport, Conn.
Allen & Collens, Architects
Larchmont Avenue Church, Larchmont, N. Y.
John Russell Pope, Architect
St. Coleman's Church, Ardmore, Pa.
Frank R. Watson, Architect
Chapel, St. Lawrence University, Ardmore, Pa.
B. G. Goodhue Associates, Architects
Monastery of the Immaculate Conception, Albany, N. Y.
Gander, Gander & Gander, Architects

Miscellaneous

Medium Security Prison, Wallkill, N. Y.
Alfred Hopkins & Associates, Architects
Federal Penitentiary, Lewisburg, Pa.
Alfred Hopkins & Associates, Architects
Hampshire House, Apartment Hotel, New York, N. Y.
Caughey & Evans, Architects
Century Apartments, New York, N. Y.
Irvin S. Chanin, Architect
Westchester County Office Building, White Plains, N. Y.
Morris & O'Connor, Architects
Union County Courthouse, Elizabeth, N. J.
Oakley & Son, Architects

Additional Information

Additional information and complete architectural specifications may be obtained from our New Haven or New York offices.

COLONIAL CUT CAST STONE CORPORATION

TELEPHONE
MUrray Hill 2-5235

51 East 42nd Street
NEW YORK, N. Y.

FACTORY AND GENERAL OFFICES: 722 Nepperhan Avenue, YONKERS, N. Y.
TELEPHONES: NEpperhan 3670-1 for Westchester Co. Subscribers; Marble 7-7622 for New York City Subscribers

Member of Cast Stone Institute

Madison Trust Company, Madison, N. J.
ERNEST F. STRASSLE, Architect, 6 E. 46th Street, New York, N. Y.

Products

We produce a Wet Poured Cut Cast Stone. Made by skilled artisans who have received their training and experience with the leaders of the industry.

The direction of a practical management insures a consistently standard quality.

Simulation of entire range of natural Granites, Marbles, Limestone and Sandstones can be obtained.

Where textured and special color effects are desired we welcome the opportunity of co-operating directly with the Architect to secure the results desired.

We have a modern well equipped plant, with water, rail, and trucking facilities and have been established 10 years.

Specifications, estimates, technical and practical information furnished without obligation.

Our Sales and New York office is in charge of an architect who will co-operate with you to the full extent.

Partial List of Recent Jobs

Administration Building and (8) Hangars, Floyd Bennett Airport, Brooklyn, N. Y.
Dunn & Gilson, Architect
St. Francis De Chantel Church and School, Bronx, New York, N. Y.
Dept. of Docks, New York, N. Y.
Calco Chemical Co., Office Building, Bound Brook, N. J.
Joannes & Marlow, Architects
Group of Buildings, Sarah Lawrence College, Bronxville, N. Y.
Bates & How, Architects
Various Buildings for New York Edison Co., New York, N. Y.
Engineering Dept., New York Edison Co., Engineers
Various Buildings, New York Central R. R. Co., New York, N. Y.
Engineering Dept., New York Central R. R. Co., Engineers
Roosevelt School, New Rochelle, N. Y.
Tooker & Marsh, Architect
Young Men's Lyceum Building, Tarrytown, N. Y.
Benton S. Russell, Architect
Group of Buildings, Consolidated Gas Co., New York, N. Y.
Bartlett-Hayward Co., Engineers
Elks Club House, White Plains, N. Y.
Theodore Richards, Architect
John Wanamaker Distributing Depot, Yonkers, N. Y.
Engineering Dept., John Wanamaker
St. Benedict's School, Bronx, New York, N. Y.
G. E. Steinback, Architect
Hitchcock Memorial Church, Scarsdale, N. Y.
Renwick, Aspinwall & Guard, Architects
Mrs. Ormsby Mitchell's Residence, Greenwich, Conn.
Alfred Hopkins and Associates, Architects
Pelham National Bank, Pelham, N. Y.
Holmes & Winslow, Architects
First National Bank & Trust Co., Tuckahoe, N. Y.
Holmes & Winslow, Architects
St. Anthony's R. C. Church, Hawthorne, N. J.
T. John Folks, Architect
Masonic Temple, Mt. Kisco, N. Y.
Raymond J. Martin, Architect

ESTABLISHED 1870

THE GEO. RACKLE & SONS CO.

Station D
CLEVELAND, OHIO

A PRECAST CONCRETE UNIT OF SUPERB BEAUTY AND PERMANENT WEATHER RESISTANCE

Description

Rackle Artstone—a precast concrete unit—is an attractive, everlasting and economical building material for ashlar, sills, cornices, balustrades, and all kinds of building trim, including Gothic window frames, for exterior and interior work. It is exceptionally strong, a quality which is not only inherent in the material itself, but is augmented by steel reinforcing. Such reinforcing is of especial value in Gothic window tracery and in all work of delicate detail.

Difficult ornamentation is a specialty. The use of Rackle Artstone in this class of work enables the architect to effect economies of considerable importance.

Artstone Colors and Finishes

An almost endless variety of colors is available. White, buff, gray, red and brown in various shades and combinations are used the most.

As to finishes, while smooth and tooled surfaces are still supplied, a distinct improvement has been brought about recently by the introduction of Artstone that is hand-finished while in a plastic condition. This results in a more artistic material, varying in appearance according to the method of finishing, a product that is surprisingly dense and durable. Samples of colors and finishes sent on request.

Artstone

National Town and Country Club, Cleveland, Ohio, Decorated with Artstone
GEO. B. POST & SONS, Architects
THOMPSON-STARRETT CO., INC., Contractors

Reasons for Architects' Confidence in Artstone

During the past decade, the art of making concrete has been improved immensely. Through taking advantage of recent developments, a progressive concrete products manufacturer may pre-determine the desirable qualities of his finished materials. This is precisely the procedure of THE GEO. RACKLE & SONS CO., where all new discoveries are carefully analyzed. Where applicable, these are incorporated in Artstone, but only after intensive research and experiment have proved their positive value. Thus, the confidence of conservative architects is founded upon the inherent merits of Artstone and is maintained through such characteristics of Rackle practice as:

A well-equipped laboratory in which all materials are rigidly tested and research is always in progress.

Aggregate grading which reduces to a minimum the cement requirements for concrete made to meet the Cast Stone Institute specifications.

Restriction of fine materials (passing a 100-mesh sieve) to less than 2%, including the mineral oxides used for producing colors.

Control of the water-cement ratio by accurately calibrated measuring tanks to produce the best results in the process used by the company.

Close supervision of each manufacturing detail, which insures a much more uniform concrete than is possible in any field operation.

Careful maintenance of standards until research has caused suspension and replacement.

Periodic tests to check the uniformity of Artsone in strength, in absorption and in weatherability.

Co-operation with the Architect

The manufacturers of Rackle Artstone have always been careful to carry out with exactness an architect's ideas, and so it is always preferable to have complete information on all points from the designer of the building; but if the architect is not in a position to furnish every detail required by the contractor, the Rackle organization will often be found of service. Also, on occasions when the architect feels the necessity for consultation—perhaps regarding an estimate, or the quality and tests of the material, or its adaptation to certain designs—the co-operation of this firm may be depended upon.

Other Products

For our page on Rackle Roof Tile, see Manufacturers' Index, and for Macotta, a metal-covered concrete, see Products Index.

COWING PRESSURE RELIEVING JOINT CO.

Manufacturers of Pressure Relieving Joints

TELEPHONE
Superior 0346

226 West Superior Street
CHICAGO, ILL.

Product

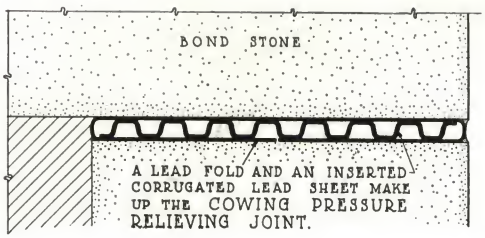
COWING PRESSURE RELIEVING JOINT.

Purpose

This joint gives positive protection against cracks and spalls in buildings of stone, terra cotta, marble or granite.

Description

The Cowing Pressure Relieving Joint is a corrugated sheet lead filler enclosed in a sheet lead envelope the thickness of the bed joint, and used in the place of one mortar joint in each story height. The Cowing Joint is made to the templet of the piers and is placed in the wall some place within the window opening, 3 to 7 ft. below the shelf angle. It carries, at all times, the dead load from the joist to the shelf angle above, which is 3 to 7 lbs. to the sq. in.



Structural Feature

This joint zones a building into story heights and prevents the breaking or spalling of stone, terra cotta, marble or granite facing blocks. It delivers exact and automatic compensation for all destructive stresses thrown on the facing material due to shortening of steel caused by temperature changes, compression of steel vibration, wind stress and imposed loads.

It permits the shelf angles to function, which they cannot do in a building where mortar only has been used. It allows the building to find its level and adjust its load without injury to the facing material.

The Cowing Joint will carry the normal load of the facing material until superimposed pressure accumulates. Under such pressure the joint compresses and relieves the stress from the facing material. The load imposed by such stress is kept on the steel as intended and the facing material and mortar are preserved.

Permanency

Once installed in a building, the Cowing Joint remains permanent. It will not squeeze out. Being lead, time and weather have no effect on it. It preserves the mortar joints and practically eliminates future tuck pointing. It is practically unnoticeable in the facade.

Penobscot Building, Detroit, Mich.
SMITH, HINCHMAN & GRYLLS, Architects

Causes of Cracks and Breaks

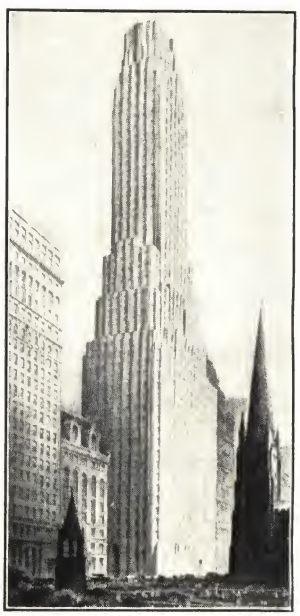
In tall structures, regardless of the rigidity of the structural steel or reinforced concrete frame, there are movements which occur that will create an overstressing of the facing material at various points. These movements may be caused by compression of the steel, wind action or unequalized expansion or contraction between the frame and the facing material due to temperature changes.

Where these movements occur—if there is not some elasticity in the face of the building—there is sure to be some cracking due to overstress.

The facing under such conditions is obviously called upon to support not only a large measure of its own weight for the total height of the building, but loads of backing masonry, and also some weight of the structure itself, that are transmitted to it by any shortening of the columns or other destructive stresses.

While it is true there is a compensating factor in the fact that extremes of temperature must strike and act upon the facing material first, and must naturally be more intense in the facing material than in the column section protected by its envelope of masonry, it is nevertheless a fact that the difference in the co-efficient of expansion of steel and stone is such that in a building 260 ft. high a change of 60° temperature in the exterior walls would cause the columns to shorten about ½ in. more than the face of the building.

The action described, which in a structure has the effect of a vise, is the only logical way of accounting for the cracking of perfectly sound facing blocks. Tests of facing blocks, after they had been so cracked, have been found to have a crushing strength equal to the average product of their particular grade, which is always many times more than sufficient to carry any possible load that could come upon them from the evident manner in which they were designed to be used. It is clear, therefore, that the cracking is not due to defective material, but to an overstrain or stress it was not intended to bear.



One Wall Street, New York, N. Y.
VOORHEES, GMELIN & WALKER, Architects

Specifications

Buildings Faced with Stone, Terra Cotta, Marble or Granite—In all steel skeleton buildings entirely faced with the aforementioned materials, use one course of Cowing Joint to each story height. Install the joint across the columns and weight-carrying mullions to the full depth of the regular facing block at the sill course level or at some point within the window opening. (See chart below.)

Buildings with Ashlar on Lower Floors Only—On tall buildings with 2, 3 or 4 stories of stone, terra cotta, marble or granite, use Cowing Joints the full depth of the regular facing block across the column and weight-carrying mullions at the sill course or some point within the window opening at the second and at the top floor of the ashlar.

For Solid Masonry Walls—Install one course of Cowing Joint 4 in. deep placed on bed, at intervals of 12 or 15 ft. in height, to provide for surface expansion. Explanatory chart sent on request.

Strike Joints As Set—All joints may be struck as set, eliminating the initial tuck pointing. Where the Cowing Joint is installed, bed mortar joints will also be protected against the destructive stresses and their life increased, resulting in a saving of future tuck pointing.

Specify—Cowing Joint, 226 West Superior Street, Chicago.

Instructions for Setting Cowing Joint

Level up with mortar any unevenness or holes that may be in the stone or terra cotta. Always pick up the lead joint edgewise with both hands to prevent buckling or bending. This will insure a smooth even bed to receive the stone. Butt ends together in mortar. Joint will be fitted to profile of column and shipped ready to install.

Merchandise Mart, Chicago, Ill.
GRAHAM, ANDERSON, PROBST & WHITE, Architects

Compression Test

The following report was made by Robert W. Hunt Co., Laboratory No. 12176, after testing a sample lead joint:

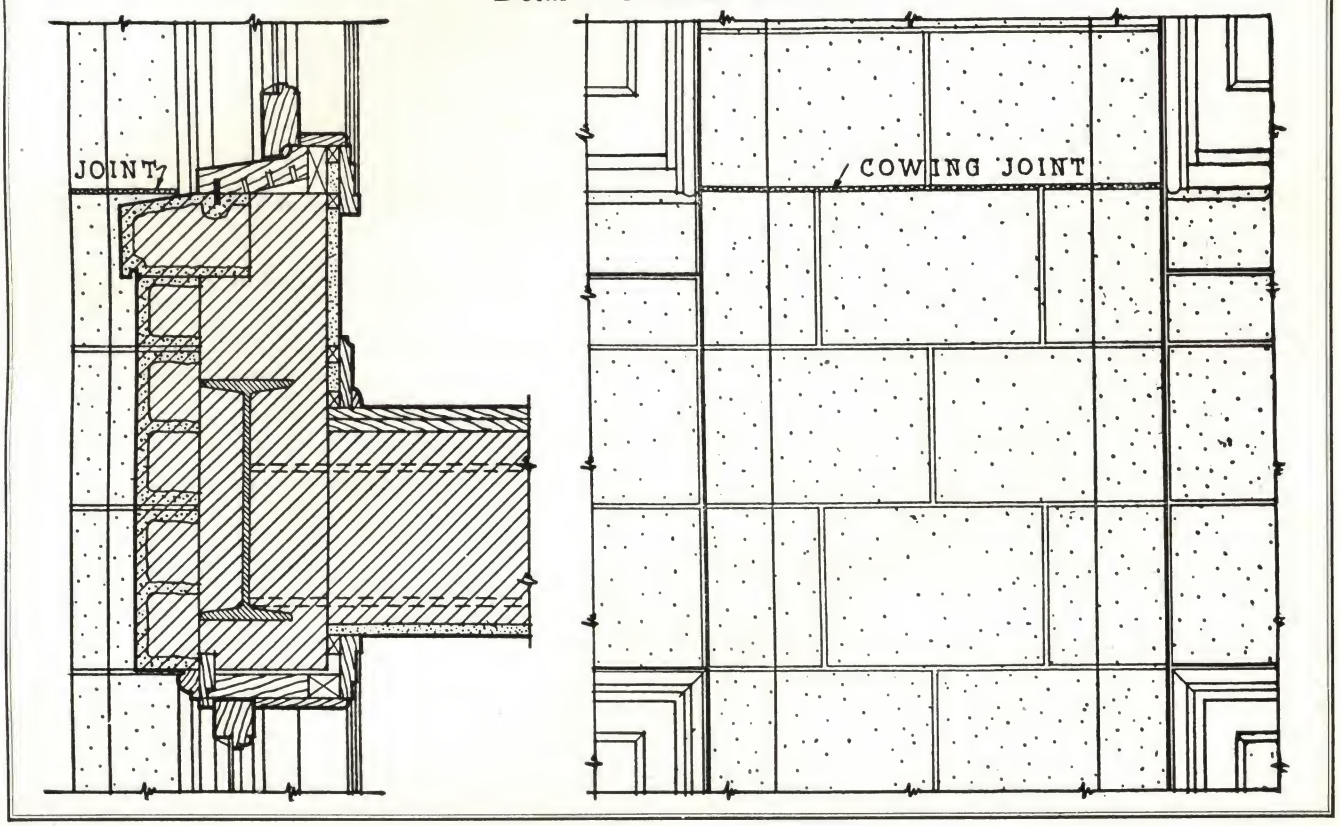
Dimension under compression, 4x2¾.
Area under compression, 11 sq. in.
Original thickness, 0.179 in.
Thickness after test, 0.101 in.
Total permanent set, 0.078 in.

Actual load, lb.	Load, lb.	Total compression, in.
1. 100	100	0.025
1. 650	150	0.035
2. 200	200	0.050
2. 750	250	0.068
3. 300	300	0.075
6. 600	600	0.094

Partial List of Installations

BUILDING	ARCHITECT
First National Bank Bldg., Detroit (2 units)	Albert Kahn, Inc.
Jackson Michigan Union Bank, Jackson	
Union Trust Bldg., Detroit	Smith, Hinchman & Grylls
Union Depot Tower, Cleveland (4 units)	Graham, Anderson, Probst & White
Foreman Bank, Chicago	
N. W. Bank and Office Bldg., Minneapolis	
First National Bank, St. Paul	
Pennsylvania R. R. Terminal, Philadelphia	
Mather Tower, Chicago	Herbert Hugh Riddle
Carbide and Carbon Building, Chicago	Burnham Brothers, Inc.
One North La Salle Bldg., Chicago	K. M. Vitzthum & Co.
Foshay Tower, Minneapolis	Magney and Tusler
Yeates Medical Arts Bldg., Minneapolis	Long & Thorshov
Rand Bldg., Minneapolis	Holabird & Root
Nebraska State Capitol, Lincoln	Mayers, Murray & Phillip
McGraw-Hill Bldg., Chicago	Thielbar & Fugard
Santa Fe Office Bldg., Amarillo, Tex.	E. A. Harrison
New York Trust Bldg.	Cross & Cross
City Bank Farmers' Trust, New York	
Waldorf Astoria Hotel, New York	Schultze & Weaver
Empire State Building, New York	Shreve, Lamb and Harmon
Omaha Union Depot	Gilbert, Stanley & Underwood
New William Oliver Bldg.	Pringle and Smith
State Office Bldg., Buffalo	Hopkins and Haugaard

ONE INCH SCALE DETAIL OF TERRA COTTA FRONT
Detail for Stone Similar



NATIONAL TERRA COTTA SOCIETY

230 Park Avenue, NEW YORK, N. Y.

FOR ESTIMATES ADDRESS INDIVIDUAL MEMBERS—LIST ON REQUEST

TERRA COTTA—ITS IMPORTANT ADVANTAGES AND POSSIBILITIES

Moderate Cost—In terra cotta, it is possible to build exclusively with large masonry units, giving dignity and impressiveness to the structure. A liberal use of terra cotta trim in connection with other masonry materials is not inconsistent with economy and may greatly enhance the design.

Ornament—This may be used freely, as it can be modeled in clay at a fraction of the cost of laborious hand carving. The designer in terra cotta is not forced by economic pressure to a barren and uninteresting architecture.

Color—This is universally recognized today as a vital element in architectural design. The virtually unlimited terra cotta palette permits any desired application of color, ranging all the way from the polychromy of intricate detail to the coloring of an entire skyscraper en masse.

Textures—All of the conventional toolings are reproduced in terra cotta. Other highly individual textures have been created that are possible only in terra cotta, which is shaped while plastic.

Glazes—Terra Cotta is made with a dull glaze or "eggshell" finish in addition to the better-known highly lustrous glazes. For work where complete absence of gloss is desirable "standard" finish should be specified.

A distinctive treatment, characteristic of terra cotta, is obtained by spraying two or more colors on the same piece in such a way that in firing they fuse together. This gives a softly mottled effect with a "pebbled" surface which has considerable life and interest.

Lighting—The rougher terra cotta surfaces possess high light reflecting properties. Terra cotta walls in areas, courts, light shafts, etc., insure maximum daylight under all conditions. Scientific tests showed 50% to 100% more daylight in a narrow city street opposite a terra cotta building than in an adjoining block where terra cotta was not used. Rough textured terra cotta buildings floodlight better.

Cleanliness—The dense, impervious terra cotta surface, being slowest to collect dust and soil, is also most easily cleaned. Original newness is restored as often as desired by simply washing with soap and water. Light reflecting surfaces are easily maintained at maximum efficiency.

Interiors—Terra cotta is an ideal material for permanent decoration for vestibules, foyers, elevator halls, corridors and public rooms generally.

Low Upkeep—Expensive repainting and redecorating are eliminated as terra cotta interiors can be washed as often as deemed desirable, without fear of injury to fine modeling or delicate colors.

STANDARD SPECIFICATIONS FOR THE MANUFACTURE, FURNISHING AND SETTING OF TERRA COTTA

These Specifications were prepared with the assistance of representatives of the Structural Service Committee of the American Institute of Architects and of the National Bureau of Standards, U. S. Department of Commerce, Washington, D. C.

Note: The Architect or Specification Writer will find it convenient to follow the Short Form Specifications beginning with Section 63.

The Short Form incorporates all the provisions of the Standard Terra Cotta Specification, but eliminates the necessity of mentioning them in detail.

Reference to the Glossary, Sections 50-62, will supply the surface finish, ceramic finish, and color data necessary to specify surface and color correctly.

The Corollary Clauses, Sections 85, 86, explain the setting option between mason and manufacturer.

Sections 87-91 under Corollary Clauses explain the specifications for flashing, sheet metal, structural steel, structural concrete and rough carpentry. These specifications form a part of the Terra Cotta Specification, although the materials are supplied and set in place by different contracting parties.

A—General Information

Drawings and Schedules

1. The Terra Cotta manufacturer shall be furnished with all drawings, details and other information necessary for the manufacture of Terra Cotta, including drawings for all classes of work with which the Terra Cotta engages.

2. Wherever Terra Cotta is required to match in contour, color, finish and surface treatment, existing Terra Cotta, as for example in connection with alterations or additions to existing work, the Terra Cotta manufacturer shall be furnished with the required profiles and samples of the original work, and other needed information.

3. The Terra Cotta manufacturer shall, before proceeding with manufacture, submit to the architect for his correction and approval, shop drawings showing jointing and construction of the Terra Cotta and provision made for all flashing and counter flashing. These drawings must conform as nearly as practicable to the architect's drawings, but shall be in accordance with good Terra Cotta structural practice.

4. All pieces of Terra Cotta shall be numbered. The Terra Cotta manufacturer shall provide two copies of the completed scale shop drawings to be used for setting and showing the piece numbering of the Terra Cotta, and the size of the joints to be used for setting the various portions of the work clearly indicated. These drawings shall be designated as the setting drawings.

5. The Terra Cotta manufacturer shall furnish, as promptly as possible, a schedule of all special anchors, hangers, etc., necessary to secure and support the Terra Cotta in a manner approved by the architect.

B—Material

Quality, Tests

6. *Note:* In view of the researches now being conducted by the National Bureau of Standards at the instance of the National Terra Cotta Society, it seems inadvisable to attempt, at this time, to write either quality clauses in terms of crushing strengths, densities and elasticity, or specifications for tests. Clauses descriptive of the desirable physical characteristics and of tests to prove compliance of the material with such physical requirements will be prepared as soon as the necessary data are available and inserted in a later edition of this standard specification.

Modeling

7. All ornament shall be artistically modeled by the Terra Cotta manufacturer's staff artists. (Or, models made to Terra Cotta shrinkage scale will be furnished to Terra Cotta manufacturer, without cost to him, securely crated for shipment f.o.b. modellers' studio at .)

8. Photographs in duplicate of all ornament shall be submitted to the architect for his approval or correction, or, if he so desires, he may inspect all modeling at the factory. Such approval or inspection by the architect shall be made promptly. No ornamental work shall be burned until modeling has been approved.

Surface Finish, Ceramic Finish and Color

9. The surface finish, ceramic finish and color of all exposed surfaces of Terra Cotta shall be as indicated by the architect's drawings or as specified. For surface and ceramic treatments, see Glossary of Terms relating to Terra Cotta, which is hereby made a part of this specification.

10. The ceramic finish shall be applied to the Terra Cotta in such a manner as thoroughly to coat the exposed surfaces.

Samples

11. The Terra Cotta manufacturer shall submit samples of the color or colors of the ceramic finish to the architect for his approval, and all Terra Cotta shall conform without marked variation to the sample or samples so approved.

C—Design and Structure

Ends, Walls and Partitions

12. Walls shall not be less than one inch thick and partitions shall be of such thickness and so spaced as to perform their proper functions with regard to form and structure. Each piece of Terra Cotta shall be provided with the necessary anchor holes and hand holes and shall be so formed as properly to engage the structure. Beds generally shall be not less than 4 in. deep.

Washes, Weep Holes and Drips

13. Projecting courses, cornices and heavy ornamental detail may have washes, drips and weep holes, where shown on the approved shop drawings.

Preparation for Flashing

14. Where so shown the washes of all projecting cornices and other exposed horizontal surfaces shall have provision made for flashing. All surfaces where the wash pitches inward toward the structure and stops against superimposed work; all balcony floors, and all gutter grades shall have provision made for flashing.

15. Raggles shall be provided to receive gutter linings and flashings when the joints can not be used for the purpose. Raggles shall be not less than ¾ in. deep.

16. All capping courses, copings and sills except of the "slip" type, shall have stools and lugs at intersections with vertical surfaces.

Joints

17. All joints shall be straight and true and of an approximate uniform width of ¼ in. All Terra Cotta shall be laid out at the factory to test it for uniformity of joint widths and over-all dimensions. Where necessary to secure accurate dimensions and uniform joint widths, the material shall be sized straight and true.

D—Transportation, Storage and Protection

Shipment, Delivery and Care

18. Unless otherwise specifically agreed, all Terra Cotta shall be furnished by the manufacturer f.o.b. cars factory, with freight allowed to destination. All Terra Cotta shall be carefully packed in hay, straw, excelsior or other suitable material.

Replacements

19. If any pieces of Terra Cotta are damaged in transit, the manufacturer shall be immediately notified in writing by the setting contractor and proceed with the remaking of the pieces. The responsibility for the cost of such replacements shall be determined by the point of delivery fixed by the contract under which the Terra Cotta is delivered. If the point of delivery is beyond the immediate control of the manufacturer, the setting contractor shall assume responsibility for the necessary proof of damage.

E—Erection

Handling

20. The setting contractor shall receive the Terra Cotta on arrival at the freight yards and shall transfer it without damage from the cars to the building. When the Terra Cotta manufacturer delivers on trucks at the building the setting contractor shall unload and store the Terra Cotta. Terra Cotta shall be stored under cover not in contact with the ground, stacked without inflammable packing on wood laths or strips, so as to protect it from injury.

Mechanics

21. All Terra Cotta shall be set by mechanics experienced in the handling and setting of the material.

Cutting and Fitting at the Building

22. Notice of errors in the manufacture of the Terra Cotta shall be given to the manufacturer immediately upon discovery. Cutting or fitting due to such errors shall be done by the Terra Cotta manufacturer or shall be paid for by him if he fails to do the necessary cutting or fitting promptly upon receipt of notice.

23. Other necessary cutting and fitting of the Terra Cotta that may be required at the building, including all fitting around anchors, steel and iron work and reinforced concrete, shall be done by the contractor for setting Terra Cotta.

Supporting Metal Work and Anchors

24. *In Connection with Structural Steel*—Beams, channels, angles, T's, plates and fabricated members for supporting Terra Cotta and which are not secured to the structural steel by rivets or short bolts, as shown on the architect's drawings, together with all anchors, hangers, bolts, clips, straps, rods and pins for securing Terra Cotta, shall be furnished and set by the contractor for setting Terra Cotta.

25. *In Connection with Structural Concrete*—The contractor for structural concrete shall furnish and set all supporting metal work inbedded in the concrete and all shelf angles and continuous rods. All such metal work shall conform to the requirements of the setting drawings prepared by the Terra Cotta manufacturer.

26. All other loose iron such as clamps, hangers, clips, straps, and pins shall be furnished and set by the Contractor for setting Terra Cotta.

27. All anchors, hangers, bolts, clips, straps, rods and pins for securing Terra Cotta shall be of wrought iron or noncorroding soft steel.

28. Anchors, hangers, bolts, clips, straps, rods and pins for securing the Terra Cotta, except where otherwise shown or specified, shall be of the following minimum sizes:

29. Anchors:—(a) For ashlar or courses balanced on the wall, shall be ¼x¼ in. or ⅛x⅝ in., or No. 6 gauge galvanized wire.

30. (b) For projecting courses not balanced on the wall, shall be not less than ⅝-in. round or square bars or equal cross section.

31. Hangers shall be ⅝-in. diameter round bars or other shapes of equal cross section area.

32. Clips and straps shall be ⅜x2 in.

33. Pins shall be ½-in. diameter round bars.

34. Continuous rods on concrete wall faces to which Terra Cotta ashlar is clipped, shall be ⅝-in. diameter round bars which shall be secured to the masonry with ½-in. diameter round anchors placed not more than 2 ft. 0 in. on centers.

35. All steel or iron supporting metal work shall be clean and thoroughly protected with two coats of pure red lead and linseed oil paint, asphaltum applied hot, or other approved protective compound.

Protection of Supporting Metal Work

36. Metal work of every description, supporting Terra Cotta, shall be imbedded thoroughly in the masonry backing and when not so imbedded, metal work shall be protected against corrosion by encasing with cement mortar or in cement mortar masonry.

37. When the back of a Terra Cotta course comes in con-

tact with iron or structural concrete in such manner as to prevent the encasing of supporting iron from the rear, an opening shall be made in the top to admit of the placing of the encasing mortar as required above.

Mortar

38. All cement used for setting mortar shall be a standard brand of Portland cement fulfilling the requirements both physical and chemical of the standard specifications for Portland cement adopted by the American Society for Testing Materials.

39. All sand used for setting mortar shall be clean, sharp and well graded in size.

40. All mortar for setting and pointing shall be composed of one volume of Portland cement to three volumes of sand. Hydrated lime, not to exceed 9 pounds to the sack of cement, shall be added.

41. The sand and cement and lime, if any, shall be thoroughly mixed dry before any water is added. The use of retempered mortar shall not be permitted.

Setting

42. All Terra Cotta shall be set true to a line and carefully laid in a solid bed of mortar. All rebates in bed and cross joints from front to back and top to bottom, shall be filled solid with mortar leaving no voids. Each piece of Terra Cotta shall be tamped into place, excess mortar cut off and struck with a jointer or trowel. All sills, wall copings and other capping courses, shall be set in a thick bed of mortar and well pounded down so that the mortar fills all spaces around bottom of webs of Terra Cotta.

43. All Terra Cotta projecting courses shall be so set that the arris casting a shadow shall be true to line.

44. When the Terra Cotta work is of such scope or character that the proper handling and setting of the Terra Cotta require special skill and knowledge, the Terra Cotta manufacturer shall, if required by the contract, furnish a competent Terra Cotta setter to assist in the sorting, selecting and handling of the Terra Cotta, to co-operate with the setting contractor, to assist him when cutting or fitting of the Terra Cotta is necessary, to advise as to interpretation of setting drawings, and to help generally in securing rapid, efficient progress during the setting of the Terra Cotta. For such service the setting contractor shall pay such setter full time at his regular wage rate. When the furnishing of such a competent setter involves traveling expenses, the setting contractor shall pay the same and also make an allowance for his board.

45. When the services of such a competent setter are not required under the contract, the Terra Cotta manufacturer may, at his own option and expense, send such a representative to the work who shall perform the above services, and the setting contractor shall co-operate with and aid and facilitate the performance of such services by such representative.

Pointing

46. All joints in Terra Cotta shall be pointed and struck as the setting progresses except in freezing weather. In freezing weather and when re-pointing is necessary, all joints shall be raked or cut out to a depth of ½ in. and the pointing mortar driven into the joint and struck with a jointing tool.

47. All joints in overhanging Terra Cotta, balustrades, parapets and free standing features shall have joints raked out one-half (½) inch, and pointed with an approved elastic cement.

Protection

48. All uncompleted walls including Terra Cotta and backing shall be protected by waterproof covering at night and at any time when liable to injury from storms or freezing.

(Note: All other protection required for projecting courses, jambs of openings, etc., is provided for under the work of other trades.)

Cleaning Down

49. Upon completion of the work, mason's wedges, shoring, supports and centering and all other false work and protections shall be removed and the Terra Cotta cleaned down. If satisfactory results can not be obtained by the use of abrasive soap or washing powder, a solution consisting of 1½ pints of muriatic acid to a gallon of water may be used. In the use of acid solutions only wooden pails and fibre brushes shall be employed.

Glossary of Terms Relating to Terra Cotta

Surface Finish

50. Surface Finish designates the texture of the surface of the clay body prior to application of Ceramic Finish.

51. It may be:

(a) *Smooth.*

(b) *Tooled or Drove.*

(b1) Eight lines to the inch.

(b2) Six lines to the inch.

(c) *Light irregular drag or combing.*

(d) *Heavy irregular drag or combing.*

(e) *Special.*

52. A special Surface Finish like "bush-hammered," "pitted," "vermiculated," etc., involves extra expense and, if required, should be clearly specified.

53. *Surface Finish for unglazed surfaces* may be smooth or may be tooled with a light or heavy drag. Flat surfaces of sufficient width may be tooled, while the curved surfaces of mouldings may be left smooth.

Surface Finish for glazed Ceramic Finish (whether lustrous or mat) is usually made smooth.

54. *Granite Colors,* if unglazed, may be made smooth or with irregular drag, or pitted. A bush-hammered or special surface involves extra expense, and if required should be clearly specified. If glazed Ceramic Finish is used for Granite Colors the surface treatment is usually smooth.

Ceramic Finish and Color

55. Ceramic Finish designates the surface and color applied by the ceramic processes of coating, glazing, burning, etc.

56. (1) *Unglazed Terra Cotta:* Terra Cotta with a Ceramic Finish producing an unglazed finish made in various shades of buff, gray, salmon, red and brown. Most colors thus made are vitreous.

57. (2) *Glazed or Enameled Terra Cotta:* Terra Cotta having an impervious Ceramic Finish of a glassy texture which may be either lustrous or mat (sometimes designated as full or dull glazes or enamels) made in various colors.

58. (3) *Granite Color Terra Cotta:*

(a) Unglazed Granite Color:—A mottled Ceramic Finish similar to unpolished granite.

(b) Glazed or Enameled Granite Color:—A mottled Ceramic Finish similar to polished granite, made either lustrous or mat.

59. (4) *Polychrome Terra Cotta or Faience:* Terra Cotta having two or more colors on the same piece.

(a) Polychrome, Unglazed:—Unglazed Terra Cotta having two or more colors on the same piece.

(b) Polychrome, Glazed:—Glazed Terra Cotta having two or more colors on the same piece.

(c) Polychrome, Blended Colors:—Made only in glazed Terra Cotta. If, in polychrome glazed work, the colors are not to be separated by definite lines or contours of ornaments, but are to be blended together by brush treatment, or the like, the term "Polychrome, blended colors" shall be used. The character of work expected should be explicitly described.

(Note: For polychrome work always clearly specify the work to be done and the number of colors on a single piece.)

60. (5) *Special:* There are a number of Ceramic Finishes used by individual manufacturers the processes for which are patented or the names copyrighted which are not included in this Glossary.

61. (6) *Semi-Glaze:* An ambiguous term which should never be used.

62. (7) *Fire-Gilding:* A coating of gold glaze either mat or lustrous, fixed by an additional burning. (The area of surface to be gilded should be clearly described.)

Short Form Specification for Incorporation in the Architect's Specifications

To be used in connection with Standard Specifications and the Standard General Conditions of the American Institute of Architects.

63. *Note to Architect:*—The Standard Specification does not state who shall set the Terra Cotta, who shall provide wood centering, scaffolding, hoists, cover boards and protection (except tops of walls against weather). It does not include any cement or concrete work in connection with forming gutter grades and washes on projecting courses and features, or the furnishing or setting of sheet metal flashings and gutter linings. It does not include the furnishing and erection of metal supporting members which are riveted or bolted with short bolts to the structural steel or structural concrete. It requires the architect to show on his drawings the sizes and arrangement of rolled or fabricated structural shapes used for supporting Terra Cotta. (See notes on corollary clauses at end of this specification for the work of other trades to take care of such omissions.)

General Conditions

64. The general conditions of the American Institute of Architects, Third Edition, shall form a part of this specification and contract and all work shall be subject to the provisions thereof.

Work Included

65. The work included in the contract comprises the manufacture, (and) delivery (and setting) of all Terra Cotta in accordance with the contract drawings and these specifications.

66. All (here insert a complete description of work) shall be of Terra Cotta.

Work Not Included

67. The following items are not included as a part of the contract for furnishing (and setting) Terra Cotta.

(a) Masonry backing. See specifications for (.....).

(b) The furnishing and erection of metal supporting members which are riveted or bolted with short bolts to the structural steel. See specifications for (.....).

(c) Cement or concrete grading for gutters, washes, floors, etc. See specifications for (.....).

(d) Furnishing and setting sheet metal, see specifications for (.....).

Materials and Workmanship

68. All Terra Cotta work under this contract, except as hereinafter specified, shall be executed in strict conformity with the Standard Specification for the Manufacture, Furnishing and Setting of Terra Cotta, adopted by the NATIONAL TERRA COTTA SOCIETY; which Standard Specification is hereby declared and made a part of this specification with the same force and effect as if written herein in full.

Surface Finish, Ceramic Finish and Color

69. All Terra Cotta

(Note: If several textures or finishes are to be used give location of each.)

shall be

70. (1) *Unglazed.*

Surface Finish or flat members shall be

(a) *Smooth.*

(b) *Tooled or Drove.*

(b1) Eight lines to the inch.

(b2) Six lines to the inch.

(c) *Light irregular drag or combing.*

(d) *Heavy irregular drag or combing.*

(e) *Special.*

(Note: Special surface finishes like "bush-hammered," "pitted," "vermiculated," etc., should be described.)

71. The surface finishes of mouldings and curved surfaces generally shall be

(Note: Unless otherwise specified these surfaces are generally made smooth.)

72. (2) *Unglazed Granite Colors*—Surface finishes of flat members generally shall be (a, b, c, d, e). The surface finish of mouldings and curved surfaces generally shall be

(Note: Unless otherwise specified these surfaces are generally made smooth.)

73. (3) *Lustrous or Full Glazed or Enameled*—Surface finish shall be

(Note: Unless otherwise specified these surfaces are generally made smooth.)

74. (4) *Mat or Dull Glazed or Enameled*—Surface finish shall be

(See Note 3.)

75. (5) *Lustrous or Full Glazed or Enameled Granite*—Surface finish shall be

(See Note 3.)

76. (6) *Mat or Dull Glazed Enameled Granite*—Surface finish shall be

(See Note 3.)

77. The color of the Terra Cotta generally shall be (.....) as per approved sample or samples.

78. (7) The Terra Cotta comprising....(described here in detail....) shall be (two, three, four) color polychrome. Colors (....specify where....) shall be blended.

79. (8) The surface finishes of (....specify where....) shall be fire gilded with (mat or lustrous) gold glaze.

(Note: Sections 1, 2, 3, 4, 5, 6 are alternates. If there is no polychrome work or no fire gilding omit sections 7 and 8. Sections a, b, c, d, e, are alternates for surface finish.)

Delivery

80. The Terra Cotta manufacturer shall furnish and deliver (f.o.b. cars factory with freight allowed to destination) (on trucks at the site of the building) (and set) all the Terra Cotta as indicated on the drawings or as here described.

Setting

81. All Terra Cotta shall be set by (Terra Cotta manufacturer) (mason.....). For such anchors and metal work as are to be furnished by the setting contractor see Standard Specification.

(Note to Architect: If the Terra Cotta manufacturer is to set his material include the following clause in the Terra Cotta specification. See also suggested clauses at end of this specification to take care of these omissions and for incorporation in the specifications for the work of other trades.)

82. "Hoisting service, storage space, setting mortar delivered on the scaffold, outside and inside scaffolds, runways and platforms, water, temporary light and removal of refuse, shall be furnished to the Terra Cotta manufacturer free of charge by the (....mason contractor....)."

Terra Cotta Setter

(Note to Architect: If the work is of such scope or character that the proper handling and setting requires special skill, the following clause may be inserted:)

"The Terra Cotta manufacturer shall furnish at the expense of the setting contractor a competent Terra Cotta setter to assist in the sorting, selecting, handling and setting of the Terra Cotta."

Joints

83. (The Standard Specification does not require any joints to be rubbed. If rubbed joints are to be required it should be so stated here.)

84. (The Standard Specification requires all joints to be approximately ¼ in. wide. If joints of a different width are desired it should be so stated here.)

Suggestions for Corollary Clauses

85. 1.—If the Terra Cotta is to be set by the Terra Cotta manufacturer, a clause similar in purport to the following should be included in the general requirements relating to masonry or brick work:

86. "Terra Cotta will be furnished and set by the Terra Cotta manufacturer. Hoisting service, storage space, setting mortar delivered on the scaffold, outside and inside scaffolds, runways and platforms, water, temporary light and removal of refuse shall be furnished to the Terra Cotta manufacturer, free of charge, by the (mason contractor)." A provision should also be included to the effect that the (mason contractor) shall construct the brick (concrete) backing for the Terra Cotta and "The backing shall proceed simultaneously with the setting of Terra Cotta. Each piece of Terra Cotta shall be backed up solid with brick and mortar, so as to make a perfect bond and homogeneous mass between wall lines. This backing shall extend beyond the wall line when necessary to structural stability. If concrete is used it shall not be stronger than a 1 to 9 mixture."

Also a provision under which the (mason) contractor shall place all concrete or cement grading for gutters, washes and balcony, loggia or other floors.

87. In the case of parapet walls specifications should state that flashing if used shall be carried through the wall, or if flashing be not used the back of the parapet wall shall be damp-proofed and the waterproofing carried through the wall.

88. 2.—In the specifications for sheet metal work there should be included a clause similar in purport to the following:

"The washes on all cornices and other exposed surfaces, where shown or specified, shall be covered with ( ) which shall be turned up against vertical surfaces (cap flashed) and cemented into the raggles provided for the purpose in the Terra Cotta."

89. 3.—Structural Supports.

Under "Structural Steel," a clause similar in purport to the following should be included:

"Beams, channels, angles, T's, plates and fabricated members for supporting Terra Cotta, and which are secured to the structural steel with short bolts or rivets, shall be furnished and erected by the contractor for (structural steel.)"

90. Under "Structural Concrete" a clause similar in purport to the following should be included:

"Steel beams, channels, angles, T's, plates, fabricated brackets and outlookers and other members, bolts, rods, wires, anchors, and sleeves for supporting Terra Cotta, which are inbedded in the structural concrete, also shelf angles and continuous rods attached to structural concrete shall be furnished and set by the contractor for structural concrete, in strict accordance with setting drawings prepared by the Terra Cotta manufacturer." (For information as to the sizes and character of bolts, rods, anchors, etc., see Section E paragraphs 24 to 35 inclusive on "Supporting Metal Work and Anchors" of Standard Specification for the Manufacture, Furnishing and Setting of Terra Cotta. Such supports should be clearly shown on the drawings.)

91. 4.—Under "Rough Carpentry" or other suitable division of work, there should be included a clause providing that the contractor shall furnish, set and maintain all centering, cover boards, boxing and protection for Terra Cotta, and remove the same upon completion of the work.

ATLANTIC TERRA COTTA COMPANY

19 West 44th Street, NEW YORK, N. Y.

PLANTS

TOTTENVILLE, S. I., N. Y. — PERTH AMBOY, N. J. — ROCKY HILL, N. J.

PHILADELPHIA DISTRICT OFFICE: 1003 Architects' Building, PHILADELPHIA, PA.

ATLANTA TERRA COTTA COMPANY

Glenn Building, ATLANTA, GA.

PLANT: EAST POINT, GA.
(Eight miles from Atlanta)

SOUTHWESTERN DISTRICT OFFICE: 807 Praetorian Building, DALLAS, TEX.
REPRESENTATIVES IN THE LARGER CITIES OF THE UNITED STATES AND CANADA

General

The Atlantic Terra Cotta Company is one of the largest manufacturers of Architectural Terra Cotta in the world. The especially high quality of its products and the various supplementary services to the architect and contractor plus a real spirit of co-operation in the development of any project, have gained for this company an enviable reputation in its field.

Products

Atlantic Terra Cotta is a handmade, burned clay structural material of the widest adaptability for exterior and interior construction and decoration, made in plain ashlar and any form of modeled and sculptured ornament and in any color or combination of colors.

Wall Units of Atlantic Terra Cotta—A new mechanically made Terra Cotta for the construction or facing of any type of interior walls or partitions. (See following page for details.)

Chimney Pots—An exceptionally large and attractive line obtainable in any size and any color. (See second page following.)

Fountains and Garden Pottery—Reproductions of rare and artistic vases, urns, jars, fountains, etc. (See second page following.)

Roof Tile—Classic roof tile in large sizes for monumental buildings, such as used on the Philadelphia Museum of Art, Asheville City Hall and others. Also Mission, Spanish and Moorish Roof Tile made to order in any color for special requirements. (Send for complete information.)

Catalogues

Monthly Magazine, "Atlantic Terra Cotta"—Printed for Architects and Draftsmen, fully illustrated, describing the most recent developments in Atlantic Terra Cotta as applied to modern buildings. Twenty pages and cover. Subscription free. A.I.A. Standard File No. 9C.

Wall Unit Catalogue—Containing 50 full page plates, this catalogue completely describes our new line of Wall Units for interior walls and partitions. Of great use to the designer in the architect's office. Sent on request. A.I.A. File No. 9C.

Wall Unit Catalogue Supplement No. 1—A 20-page booklet which by photographic illustrations and brief text describes several recent installations of Atlantic Wall Units. A colored insert shows some of the more popular Abbochrome colors used in conjunction with this type of Terra Cotta.

Garden Pottery Catalogue—A small booklet showing our attractive line of vases, urns, etc.

Construction Drawings—A set of 10 drawings illustrating Terra Cotta construction.

HANDMADE ARCHITECTURAL TERRA COTTA

Description

Every piece of Atlantic Terra Cotta is made by hand in accordance with the architect's drawings and specifications, and is designed to occupy a definite place in the building. The price is based on quantity only. There is no other unit for estimating purposes.

On every contract complete setting drawings are prepared which show the size and shape of every piece, its location and its attachment to the frame. These drawings are subject to the architect's approval. A complete set is sent to the contractor for guidance in the actual work of construction.

Detail, Triforium Tracery, Central Methodist Episcopal Church, Brooklyn, N. Y.
Halsey, McCormick & Helmer, Architects

The Atlantic Modeling Studios and Ceramic Laboratories at each plant are headed by sculptors and chemists of training, education and experience. Color samples will be sent on request. Photographs of modeling on definite orders are submitted for the architect's approval.

Uses

Atlantic Terra Cotta can be used for the facing or lining of an entire building or of any part of it as in the spandrels, parapets, copings, cornices, inserts—in fact, wherever the beauty of color or extensive modeled design is wanted. Atlantic Terra Cotta is particularly adaptable to present day architectural requirements as it is available in large light pieces, easy to install and with the maximum of insulation value.

It is being used for office buildings, apartment houses, public buildings, hotels, theatres, schools and churches, as well as for the smaller shops, loft buildings and factories.

Shop Model, Modern Design
William E. Lehman, Architect

HANDMADE ARCHITECTURAL TERRA COTTA (Continued)

Colors

The trend of modern architecture is toward the extensive use of color and Terra Cotta is outstanding in the field of colored building materials. Atlantic Terra Cotta can be obtained in over 150 standard shades of buff, brown, red, blue, green, gray, etc., and new tones are being developed constantly.

Abbochrome Colors—Are almost unlimited. These are produced automatically by a method which allows a number of colors to be applied simultaneously in harmonious mottled combinations. The texture, slightly rough, avoids glare and evenly diffuses light, giving a softly luminous effect. Abbochrome colors are particularly appropriate for exterior ashlar surfaces as well as for interior walls and partitions.

Spandrel Treatment, 500 Fifth Avenue Building, New York, N. Y.
Shreve, Lamb & Harmon, Architects

Conglomerate Colors—Are somewhat different in character and are usually similar to natural geological formations.

Special Colors—*Atlantic Gold*—Is real gold burnished to any degree of color from dull matt to brilliant glaze.

Atlantic Silver—Is a real silver color made on a platinum base. This color as well as the Atlantic Gold is particularly effective when combined with brilliant jet black glazed Terra Cotta.

Atlantic Scarlet Vermillion—An exclusive Atlantic color, is the brightest color in architectural polychrome.

Decorative Panel of Sun Room, Angeline Elizabeth Kirby Memorial Health Center, Wilkes-Barre, Pa.
T. H. Atherton, Architect

Glazes and Textures

"Standard" or Unglazed Finish—This is characterized by a complete absence of gloss or sheen. This finish is obtainable in a great variety of textures, ranging from comparatively smooth to very rough or irregular.

Matt or Dull Glaze—Is a smooth glazed surface without brilliant gloss.

Full Lustrous Glazes—Are smooth and brilliant, and are often used for polychrome treatment or where distinctive effects are wanted.

Abbochrome Finish—(Described above.) Is available in either Matt or Lustrous Glazes. Both glazes are absolutely impervious to the effects of weather and are not easily soiled. However, when in time they do need cleaning, they can be very easily washed with soap and water.

WALL UNITS OF ATLANTIC TERRA COTTA

Description

Atlantic Wall Units, a comparatively recent development of this Company, are a mechanically made Terra Cotta block obtainable in standard (8x16 and 9x14 in. rectangular), and other geometrical patterns with bonds of 2, 4, 6 and 8 inches. Base and cap pieces, miters, jambs, sills and lintels are also shown in our catalogue so that the designer can easily assemble walls of any type on his drawing.

The Atlantic Terra Cotta Company is always willing to co-operate by suggesting methods of construction and advice regarding economy of installation. This service is gratis, not obligatory, and applies to all Atlantic Terra Cotta.

Corridor, Carew Tower, Cincinnati, Ohio
W. S. Ahlschlager, Architect
Delano & Aldrich, Associate Architects

Advantages and Uses

Atlantic Wall Units have all the advantages of handmade Atlantic Terra Cotta including absolute permanence—fire resistance, imperviousness to the effects of weather—an unlimited range of colors, low maintenance expense, plus the very important advantage of being very low in installation costs due to their light weight, comparatively large unit size and the fact that each block is accurately ground on all four sides insuring easy and exact construction.

Their pleasant jointing scheme and their large range of colors give them a beauty which in addition to their obvious economy is causing them to be used for walls, partitions and wainscots in buildings of every description: churches, schools, factories, banks, railroad stations, theatres and hospitals. They are also being used in conjunction with handmade Atlantic Terra Cotta for exterior use, particularly on small buildings, such as service stations, stores, residences, etc. There is actually no limit to their possibilities, and new uses are being discovered daily.

Corridor, Newtown High School, Elmhurst, L. I., N. Y.
W. C. Martin, Architect

Atlantic Wall Units are made with open and closed backs, the latter scored to take plaster if desired. With the former type a partition wall with a finished Terra Cotta facing on each elevation is easily erected.

Price

A lump sum is quoted for all Wall Units required for a specified project in accordance with the architect's drawings.

CHIMNEY POTS OF ATLANTIC TERRA COTTA

Atlantic Chimney Pots serve both a practical and decorative purpose inasmuch as they increase the draft of a chimney and add a colorful or decorative touch to the roof line. They are appropriate for all types of residences and the garden type of apartment houses, and are absolutely necessary on all buildings of an Old English character if the design is to be complete architecturally.

Tudor Design Chimney Pot, CP "04" Series
ROBERT D. EDWARDS, Architect

Atlantic Chimney Pots are reproductions of authentic Tudor and Elizabethan models and are unique in the fact that they are obtainable in any desired color beside the standard colors illustrated in our catalogue.

They are made in 31 different designs and each design has several sizes to satisfactorily cover all standard flues. Of course, special sizes and designs can be made in accordance with the architect's specifications.

Although usually giving the effect of antiquity, chimney pots are sometimes made in an ultra-modern design to fit in with the style of some of the newer residences.

Where an age-old effect is desired immediately, we sometimes blacken the tops of the chimney pots at the same time the body color is applied. The black is allowed to fade gradually into the ground color giving the impression of generations of use. The effect is quaint and attractive—the additional cost slight.

Elizabethan Design Chimney Pot, CP "08" Series
JULIUS GREGORY, Architect

Atlantic Chimney Pots are made to order because, due to the great variety obtainable, it is considered inadvisable to keep them in stock with the exception of a very few popular models and sizes. Manufacturing time averages about four weeks.

A catalogue and price list will be sent on request.

GARDEN POTTERY OF ATLANTIC TERRA COTTA

Atlantic Garden Pottery are reproductions of rare and artistic Grecian, Etruscan and other classical pieces, made by hand with all the craftsmanship that such work requires. They can be made in any of the Atlantic colors, or in harmonious combination of these, in either Standard or Lustrous Glazed Finishes. The colors and surface textures are absolutely permanent as of course they are made exactly the same as Atlantic Architectural Terra Cotta.

The illustrations on this page are of clay models and do not give any real picture of the beauty and color of the finished Terra Cotta pieces.

Vase Z101
This reproduction of an antique Florentine Oil Jar is extremely beautiful in the classic simplicity of its lines

Garden pottery of this type is appropriate not only for garden use but also in many ways as a decorative adjunct in entrance lobbies and other parts of buildings. We have several sand jar designs which are not only beautiful but extremely useful in office buildings, public, buildings, department stores, etc.

Special Pottery also can be made to individual design or specifications. *Send for catalogue.*

Jar Z106
Grecian in its concept, this would be appropriate not only as a plant receptacle but as a sand jar for office building use

Wall Fountains

The ATLANTIC TERRA COTTA COMPANY manufactures several standard designs of wall fountains which are appropriate for either interior or exterior uses. Absolutely impervious to the effects of water or weather, they will preserve their beauty and usefulness forever.

An exquisitely modeled free standing fountain is also available.

Send for photographic illustrations, and prices.

Our garden pottery and fountains should not be confused with the ordinary clay product on the market. They are possessed of a beauty and richness that make them entirely distinctive in their field.

Wall Fountain 442
Attractive in design, this wall fountain is further beautified when manufactured in polychrome colors

CONKLING-ARMSTRONG TERRA COTTA CO.

"Build with Architectural Terra Cotta"

SALES OFFICE

Architects' Building, 17th and Sansom Streets
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(Works, Wissahickon Avenue and Juniata Street)

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BALTIMORE, MD., Frank E. Black, 1116 Lexington Building
CHARLOTTE, N. C., W. Fred Casey & Co., 507 No. Tryon Street
CLARKSBURG, W. VA., Thornton Fire Brick Co.
CLEVELAND, OHIO, Mars Co., Keith Building
COLUMBUS, OHIO, B. M. Freeman Co., Buckeye Building, 42 E. Gay Street
DETROIT, MICH., The Dresden Brick Co., 843 Holden Avenue
ERIE, PA., Dunn Brick & Tile Co., 12th Street near Harrison Avenue
NORFOLK, VA., Southern Building Material Co., 235 Monticello Arcade Building
PITTSBURGH, PA., J. Willis Dalzell Co., 725 Grant Bldg.
RICHMOND, VA., Earnest Bros., 805 E. Franklin Street
SCRANTON, PA., A. D. Parsons, Inc., Cedar Avenue
TAMPA, FLA., Stovall & Archer, Peninsular Telephone Building
TOLEDO, OHIO, Toledo Plaster & Supply Co., 1402 W. Bancroft Street
WILKES-BARRE, PA., William H. Pierce, 905 Second National Bank Building

Product

ARCHITECTURAL TERRA COTTA of highest quality.

Our machine made Architectural Terra Cotta Tile may be had in a wide variety of sizes. This tile is made either single or double faced and is adaptable for lining interiors, foyers, corridors, vestibules, banks, churches, restaurants, etc. Furnished glazed or unglazed. Pulsichrome or mottled finishes in colors that will please the most artistic and exacting architects and owners. Write for our catalogue.

Services

Our technical departments are always at your service, without obligation.

Norris Theatre, Norristown, Pa.
W. H. LEE, Architect FRANK R. HEAVNER, Contractor

Use of This Material

Schools, colleges, churches, theaters, office buildings, banks, store buildings, garages and factory buildings, trimmed with Architectural Terra Cotta, become neighborhood beautifiers.

This material, which has stood the test of time and the elements, with all its color and surface treatment possibilities is the logical building material where durability, decorative qualities and color are required to make a complete and permanent design.

Representative Exterior Work

LOCATION AND BUILDING	ARCHITECT
Philadelphia, Pa.	
Benjamin Franklin Hotel	Horace Trumbauer
Robert Morris Hotel	The Ballinger Co.
Scottish Rite Temple	Horace W. Castor
Atlas Storage Warehouse	George S. Kingsley (New York)
Drake Apartment Hotel	Ritter & Shay
John H. McClatchy Building	Wm. Steele & Sons Co.
Pittsburgh, Pa.	
Clark Building	Hoffman-Henon Co.
Stanley Theatre	Hoffman-Henon Co.
Reading, Pa.	
Embassy Theatre	W. H. Lee
Atlantic City, N. J.	
Hotel Blenheim and Central Pier	Price & McLanahan (now Ralph B. Bencker)
Warner Theatre	Hoffman-Henon Co.
Stanley Theatre	Hoffman-Henon Co.
Washington, D. C.	
Almas Temple	Allen E. Potts
Miami, Fla.	
Security Building	Robert Greenfield
Tampa, Fla.	
First Baptist Church	Chas. M. Hart

Representative Interior Work

LOCATION AND BUILDING	ARCHITECT
Philadelphia, Pa.	
Convention Hall	Philip H. Johnson
Horn & Hardart Restaurants, Broad and Chestnut and Market and Jupiner Streets	Ralph B. Bencker
New York, N. Y.	
Public School No. 98	Walter C. Martin
Kelsey's Restaurant	Stuckert & Co.
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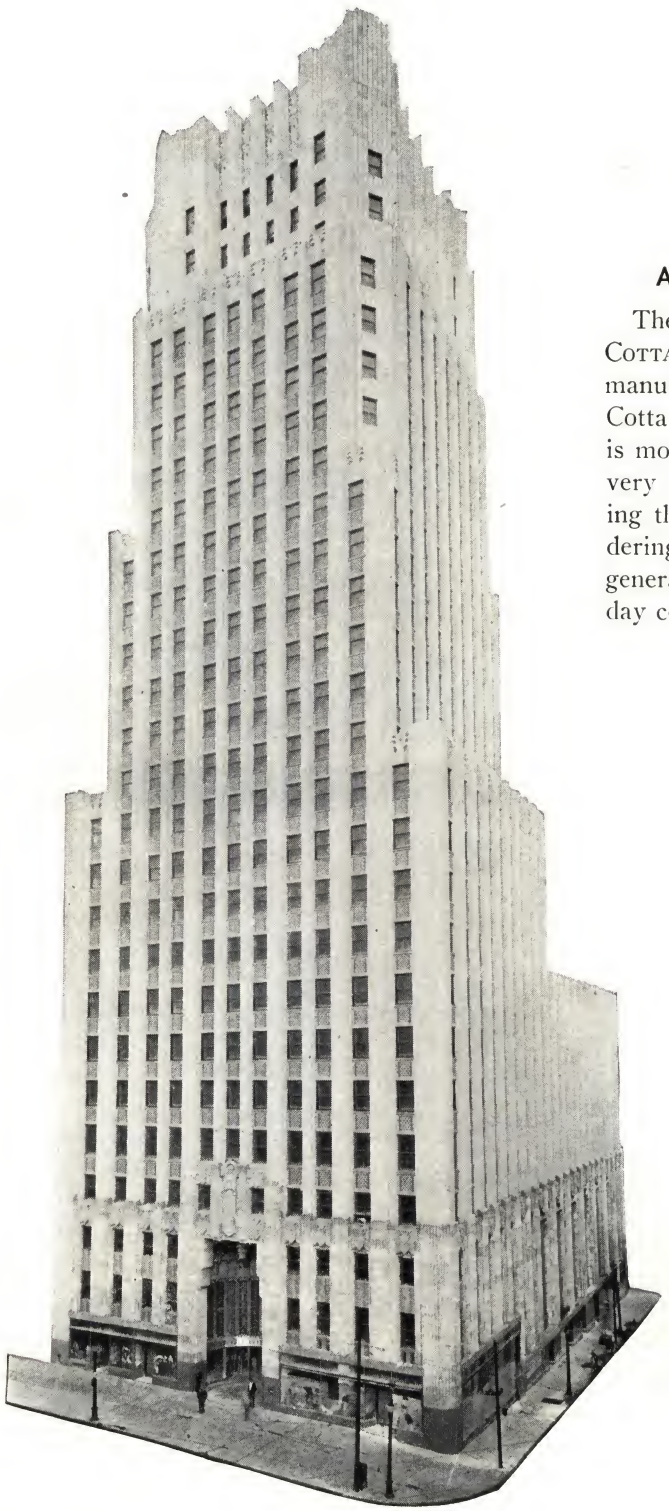
ESTABLISHED 1887

CORNING TERRA COTTA CO., INC.

Architectural Terra Cotta

MAIN OFFICE AND FACTORY
CORNING, N. Y.

AGENCIES IN ALL PRINCIPAL CITIES



Architectural Terra Cotta

The staff of CORNING TERRA COTTA CO., INC., having been manufacturing Architectural Terra Cotta for more than forty years, is most cognizant of the need of a very close co-operation in executing the architects' desires and rendering the very rapid service to the general contractors which present day conditions demand.

Central Depositors Bank Building, Akron, Ohio
WALKER & WEEKS, Architects
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ARCHITECTURAL TERRA COTTA: Hand made, for both exteriors and interiors.

MACHINE MADE TERRA COTTA ASHLAR, SILLS, COPINGS, MOULDINGS, etc.

TERRA COTTA WALL TILE.

BAS-RELIEFS and SCULPTURED TERRA COTTAS in polychrome or monotone colors.

Also Vases, Garden Ware and Chimney Pots.

Color

Ceramic colors and finishes of proved merit cover such a wide range that the variety of selection presented to architect and owner is almost limitless. EASTERN TERRA COTTA COMPANY presents the results of forty-five years of constant research in this department. EASTERN TERRA COTTA COMPANY applies these ceramic finishes to terra cotta which has been fabricated to outlast the building of which it will form a part.

Quality

For forty-five years the EASTERN TERRA COTTA COMPANY personnel has manufactured terra cotta of the highest quality only. Its product meets the most exacting requirements of architect and owner.

Service

EASTERN TERRA COTTA COMPANY has at its command most complete facilities for the rendering of steady and dependable service to its customers.

Tympanum in One Piece for St. Raymond's Rectory, Base Dimension, 48 In.
GEORGE H. STREETON, Architect

Background is a shaded blue, figures in white matt glaze and border in gray unglazed limestone color with manganese speckle to tone with terra cotta trim used throughout the building

Fundamentals

Only the highest grade of selected clays, scientifically mixed and thoroughly pugged, tempered and aged, enter into the construction of Eastern Terra Cotta.

With solidly pressed faces, sides and ends, all of honest thickness, and with heavy struts adequately placed, each piece of Eastern Terra Cotta has fabricated into it the guarantee of permanence.

From Series of Panels, Each 45 Ins. High, Occurring as Jamb Feature in Samuel Gompers Industrial High School
WALTER C. MARTIN, Architect

ESTABLISHED 1810

GALLOWAY TERRA COTTA COMPANY

Manufacturers of Galloway Pottery

3200 Walnut Street, PHILADELPHIA, PA.

Products

GALLOWAY GARDEN and DECORATIVE POTTERY and TERRA COTTA, including: Flower Pots, Boxes, Vases, Bird Baths, Sun Dials, Tables, Benches, Hermes and Statuary.

Also Architectural Terra Cotta.

For Galloway Hand Made Chimney Pots, see Manufacturers' Index.

Catalogue

Our latest catalogue of Galloway Pottery and schedule of Chimney Pots will be sent on request.

Galloway Pottery for Garden and Interior Use

The Galloway organization has been making pottery for over a hundred years. The artistic worth, fine workmanship and durable quality of materials embodied in Galloway Pottery are all endorsed by our hundreds of pleased customer-friends.

The Galloway Pottery shown herewith represents only a few of the many original designs and replicas from antique art which we carry in stock or make to order. Careful workmanship makes Galloway Pottery a welcome addition to the finest interiors; its durability GALLOWAY POTTERY is an essential feature for out-of-doors decoration.

Galloway Pottery Finishes

We find that the most popular finish is the light stony gray. Red, buff and other colors can be made to order as well as a variety of glazes, which finish is especially well suited to jars.

Jars

Jars have a fascinating interest in a decorative treatment that no other object seems to possess. A pair of shapely, colorful jars will give a sparkling touch to an otherwise drab spot in the garden, sunroom or house.

Color

Jars are usually carried in the glaze finish, though the high-fired red unglazed terra cotta is a pleasing tone for many settings. Light stony-gray can also be had. Our high-fired glazes range through blues and greens of varying hues. In ordering state if you prefer the blue or green tone to predominate. Other colors will be made on order.

Pot or Well Curb No. 713, 32 Ins. Wide

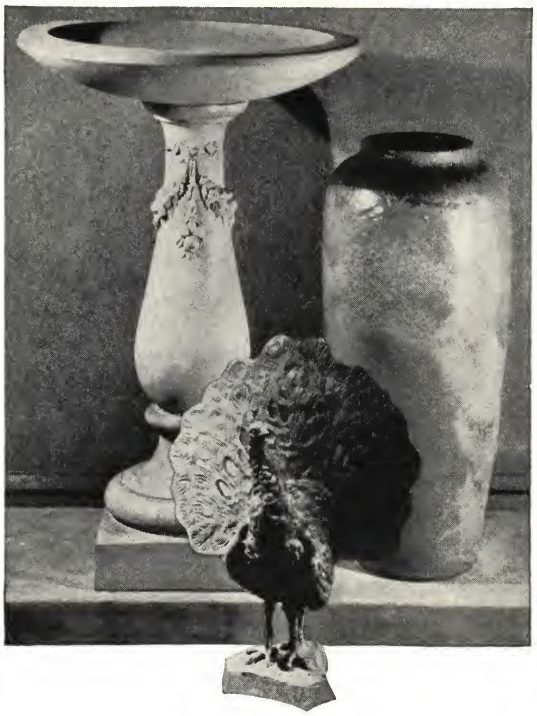
Jar No. 278, 36 Ins. High

Large Jar in a Beautiful Setting
BENJAMIN W. MORRIS, Architect

Pot No. 714, 32 Ins. Wide

Jar No. 275, 45 Ins. High

No. 480, 21x17½ Ins.



No. 826, 25x17 Ins.

No. 829, 25x20 Ins.

GALLOWAY POTTERY
ESTAB. 1810

No. 284, 30x17½ Ins.

No. 466, Bowl Only, 19x17½ Ins., Opening, 14½ Ins., Total Height, 24 Ins.

Wall Font, No. 418 Dolphin, 24 Ins. High, No. 419 Bowl, 12x29 Ins.

No. 73 Jar Only, 22x19 Ins., Total Height, 28 Ins.

FEDERAL SEABOARD TERRA COTTA CORPORATION

Manufacturers of Architectural Terra Cotta

TELEPHONE
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10 East 40th Street, NEW YORK, N. Y.

FACTORIES: PERTH AMBOY, WOODBRIDGE, and SOUTH AMBOY, N. J.

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ARCHITECTURAL TERRA COTTA for exteriors and interiors of buildings of the permanent type.

Also Solid Back Machine Made Clay Building Blocks, glazed in all ceramic colors, particularly adapted to interiors, school corridors, power stations, hospitals, and all places where a fire-resisting, light reflecting, sanitary wall is desired.

Quality

Federal Seaboard Terra Cotta is in every sense of the word a quality product. Graduate ceramic engineers, trained in correct terra cotta technique, are constantly adding new color glaze combinations and textures to a palette which even now possesses a wonderful range of richness—giving the designer an almost unlimited choice of imperishable colors, backed by the qualities gained through many years of achievement in the production of terra cotta.

Modeling

Directing this department is an artist of exceptional ability and training, and under his guidance is a group of artists eminently qualified to create with stylistic correctness decorations in relief, ranging from the accepted classic forms to the modern art.

Production

FEDERAL SEABOARD TERRA COTTA CORPORATION owns and operates three large and modern factories in New Jersey, each with a personnel technically equipped to efficiently produce in large quantity the finest terra cotta.

Price

For definite price, send us architects' elevations and floor plans and specifications, if available.

Approximate estimates of costs can be furnished from sketches.

Service

Technical information on construction, design and color possibilities is promptly available upon request.

Buffalo Courier Building, Buffalo, N. Y.
MONKS & JOHNSON, Architects
JOHN W. COWPER, Contractor

RCA-Victor Building, 51st Street and Lexington Avenue, New York, N. Y.
CROSS & CROSS, Architects
A. L. HARTRIDGE, Contractor

Representative Work

BUILDING AND LOCATION	ARCHITECT
Fisher Building, Detroit, Mich.	Albert Kahn
Williamsburg Savings Bank, Brooklyn, N. Y.	Halsey, McCormack & Helmer
Hotel New Yorker, New York, N. Y.	Sugarman & Berger
National City Building, New York, N. Y.	McKim, Mead & White
Hecht Stores, Washington, D. C.	Jarvis Hunt
Chase National Bank, New York, N. Y.	Graham, Anderson, Probst & White
Roxy Theatre, New York, N. Y.	Walter W. Ahlschlager
Barlum Building, Detroit, Mich.	Bonnah & Chaffee
Cathedral of the Sacred Heart, Newark, N. J.	I. E. Ditmars
Theatre (Loew), Kansas City, Mo.	Thomas W. Lamb
Library, Cleveland, Ohio	Walker & Weeks
Read House, Chattanooga, Tenn.	Holabird & Roche
Medical Arts, San Antonio, Tex.	Ralph H. Cameron
Hotel Roosevelt, New Orleans, La.	Favrot & Livaudais
Alamance County Courthouse, Graham, N. C.	Harry Barton
Packard Building, Philadelphia, Pa.	Ritter & Shay
Biltmore Hotel, Atlanta, Ga.	Schultze & Weaver
Keith Memorial Theatre, Boston, Mass.	Thomas W. Lamb
Mastbaum Theatre, Philadelphia, Pa.	Hoffman-Henon
Polsky Store, Akron, Ohio	Starrett & VanVleck
Lefcourt Newark, Newark, N. J.	Frank Grad
Grove Arcade, Asheville, N. C.	C. N. Parker
Asbury Park Casino, Asbury Park, N. J.	Warren & Wetmore
Medical Arts, Knoxville, Tenn.	Manley & Young
Bank of Manhattan, New York, N. Y.	H. Craig Severance and Yasuo Matsui
Midland Bank, Medical Arts and Builders Exchange Buildings, Cleveland, Ohio	Graham, Anderson, Probst & White
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ARCHITECTURAL TERRA COTTA; HAND MADE "AGEART" TERRA TILE; CHIMNEY POTS.

FACE BRICK; ENAMELED BRICK; SALT GLAZED BRICK; FLOOR BRICK.

HOLLOW TILE FIREFROOFING.

Also Paving Brick.

Services

Architects desiring expert advice on architectural terra cotta construction, brick or fireproofing may feel free to call upon us for such service.

Extensive exhibits of our products may be seen in all our offices.

Descriptive booklets or samples may be had on request.

Architectural Terra Cotta

We manufacture all kinds for exterior and interior work, decorative or plain of all colors and finishes, as well as polychrome.

Face Brick

Our line consists of all colors and finishes, together with moulded brick. The most intricate shapes and design.

Salt Glazed Brick

With radius jamb and sill moulds. Also moulded base and cap, and special sanitary floor brick.

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In different sizes, glazed and unglazed, for use in packing houses, battery rooms, milk dairies, etc.

Enameled Brick

These can be had in all colors, sizes and shapes.

"Ageart" Terra Tile

Special hand made roofing tile made of any form, finish or color or blended colors.

Hollow Tile

Made in standard sizes, shapes and different weights for exterior and interior construction.

Red Chimney Pots

Red Chimney Pots of various sizes and designs carried in stock.

Other colors and special designs made to order.

West Side Y. M. C. A., New York, N. Y.
Dwight James Baum, Architect

LA LUZ CLAY PRODUCTS COMPANY

52 East 52nd Street
NEW YORK, N. Y.
WORKSHOPS AT ALAMOGORDO, NEW MEXICO

The Story of La Luz Clay

At La Luz in New Mexico, in the process of a general survey of a property of considerable extent, a clay was found of such unusual composition, according to the research of experts, as to challenge the beauty of color and texture of Italian ware. Moreover, the clay possesses strength and durability which permit its being worked into vases five feet high, qualities which are seldom found. It has been submitted to some extraordinary tests which assure the durability of La Luz Clay Products.

La Luz has an individual coloring of warm pink and pastel shades. It is truly typical of the name La Luz "The Light", for its rich coloring has life and light and its soft tints react delicately to atmospheric conditions, causing the pottery and tiles to change in color,—now deepening, now paling in a most interesting manner. The strength and durability of La Luz Clay and its decorative color effect render it particularly suitable for large vases and jars for ornamental purposes and tile roofs where the softer shades, combined with the unreproducable effect of the hand-made product, are desired.

La Luz Pottery—Fashioned by Hand

At the workshop in La Luz, New Mexico, La Luz Clay is fashioned into distinctive pottery and other products on hand wheels by artist potters. Each piece represents a translation of the art of ancient potters. Through these skillful artisans working the wet clay by hand, some of the finest examples of primitive design are re-created in the appropriate medium of La Luz Clay.

Because each piece is an individual creation made by hand they vary slightly in thickness, width and height. This individuality is a feature of La Luz—the same clay worked in mass production by modern machinery would lose its distinctiveness and inherent beauty.

The designs illustrated here are representative of our complete collection, a catalogue of which will be gladly furnished upon request.

Special Designs and Measurements to Order

We specialize in the execution of original designs and special measurements on order. Estimates as to cost and delivery will be submitted in advance.

100 A. Cretan Jar
5 feet high by 40 inches wide

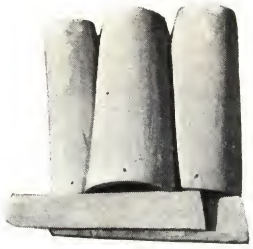
55. Vase
31 x 22¼ in.

29. Tree Jar
13½ x 20 in.

116-B. Sand Jar
18 x 9 in.
Opening 8 in.

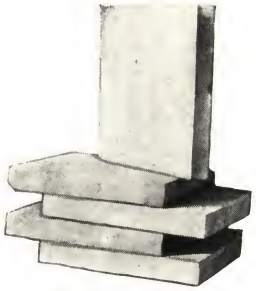
35. Large Vase
37 x 29 in.

9. Strawberry Jar
16½ x 13 in.



89. Roof Tile

95. Chimney Pot
29 x 11 in.
4½ in. openings



88. Floor Tile
4 x 4 in. squares and special sizes

A roof of La Luz Tile with a Chimney Pot to Match

34. Flower Bowl
16½ x 18 in.

Showing the Effective Use of La Luz Floor Tile

Hand-Made Floor and Roofing Tile

At La Luz are also being made, with a very wide range of similar colors, genuine hand-made floor and roofing tiles possessing an immediate appeal to the discerning architect of discrimination who is seeking for his client the unusually beautiful and individual combined with good taste.

These tiles are being made in the Spanish, Mission and Shingle types and floor tiles of various dimensions but, as they are a hand-made product, we are equipped to consult with anyone desiring other than stock patterns or dimensions. Full details gladly furnished upon request.

The weathering and wearing qualities of La Luz Tiles adapt them to all climatic conditions.

Glazes

Any La Luz product, if desired, can be furnished in glaze in a very comprehensive range of colors. The glazes are effected in the Company's own chemical Laboratory at the Workshops.

20. Large Vase
36 x 23 in.

33. Jar
29 x 19 in.

8. Strawberry Jar
6½ x 12 in.

15. Jar
28 x 23 in.

71. Tree Jar
16¼ x 16 in.

49. Large Vase
33½ x 19 in.

4. Large Vase
41 x 14 in.

THE NORTHWESTERN TERRA COTTA COMPANY

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OTHER PLANTS: Chicago Heights, Ill. Denver, Colo. St. Louis, Mo.

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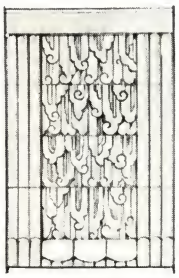
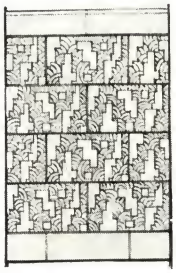
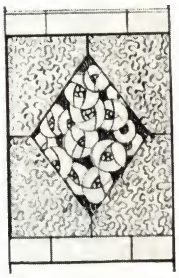
Terra Cotta Spandrel

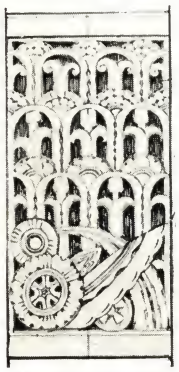

Terra Cotta Spandrel


Terra Cotta Spandrel


Terra Cotta Spandrel

Terra Cotta Spandrel

Terra Cotta Spandrel


Terra Cotta Spandrel

NORTHWESTERN PRODUCTS

Architectural Terra Cotta for exteriors and interiors, in plain, ornamental or sculptured design, in all finishes, and in any desired color or combination of color.

Northwestern Terra Cotta in stock designs; Northwestern Multi-Unit Sills for steel sash windows; Northwestern Chimney Pots; Northwestern Garden Pottery; Northwestern Faience and Northwestern (Art-I-San) Wall Blocks.

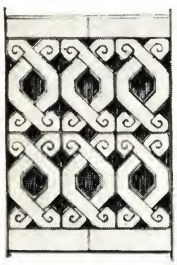
NORTHWESTERN SERVICE

More than Fifty years of practical experience has equipped this Company with both personnel and plants that insure a service unsurpassed in the industry.

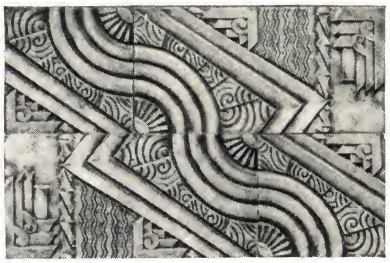
NORTHWESTERN SPECIFICATION

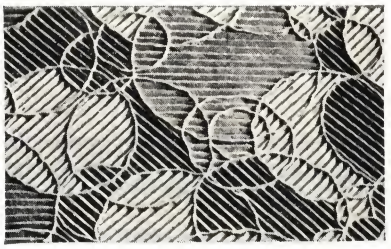
We suggest that architects write direct for information about our product — color treatment, mechanical texture, construction and design, for all types of buildings.

Terra Cotta Spandrel


Terra Cotta Spandrel

Terra Cotta Spandrel

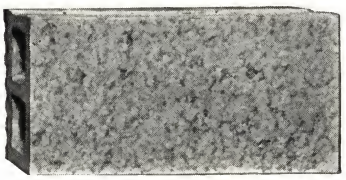


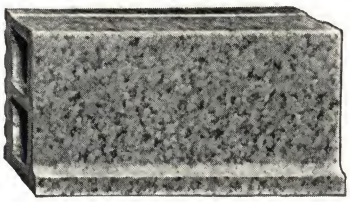


Northwestern Terra Cotta can be obtained in a variety of textures, ranging from the shallow relief to rugged or modeled surfaces. Broken surfaces are now widely used for decorative effects, as well as for the reason that the light reflecting qualities of rough textured Terra Cotta make floodlighting economical in that less equipment and current are required than for smooth surfaces.

Northwestern Wall Blocks are produced to meet the demand for a high-grade fire-resisting material of architectural merit and possibilities suitable for interior and exterior walls, where light, economy, durability, beauty or cleanliness should be considered.

The impervious glazed ceramic surface requires no maintenance and will last indefinitely. The walls can be kept clean and sanitary at all times simply by washing with soap and water.





We offer a wide range of beautiful high fire impervious ceramic finishes, either in mottled or plain glazes.

Our Designing and Ceramic Departments will gladly cooperate with architects and owners in developing any special color effects desired.

Our Sales Department will gladly furnish quotations for all material required. Architects' plans and specifications should be forwarded to us for this purpose.

BLOCK CONSTRUCTION

THE AR-KE-TEX CORPORATION

NATIONAL DISTRIBUTORS FOR AR-KE-TEX TILE
MANUFACTURED BY CLAY PRODUCTS CO., INC., OF
INDIANA AND CONTINENTAL CLAY PRODUCTS CO.

REPRESENTED LOCALLY BY

THE AR-KE-TEX CORPORATION

National Distributors of AR-KE-TEX *Tile*

Made by CLAY PRODUCTS CO., INC. OF INDIANA *and*

CONTINENTAL CLAY PRODUCTS CORPORATION

GENERAL OFFICES: 17 N. MERIDIAN ST., INDIANAPOLIS, INDIANA

REPRESENTATIVES IN PRINCIPAL CITIES

Products

A structural clay tile with a finely finished face, known as AR-KE-TEX Tile.

Also Velveduct, a vitrified glazed clay conduit for underground electrical transmission; Building Conduit, a jumbo building block for foundations, barns, etc.; Filter Bed Tile and Raggle Block.

AR-KE-TEX ART-KERAMIC-TEXTURE

Trade Mark Reg.

Sizes

AR-KE-TEX Tile is made in 5″x12″ or 5″x8″ face sizes with a full complement of shapes and fittings as shown in this catalog to build any type of bearing or partition wall, exterior or interior, with a permanent, impervious, sanitary finish.

Textures and Colors

Cream Buff Stippled, a light color blend of Cream Buff, adaptable to a wider range of architectural effects than any shade ever developed.

Insul-Glaz, a finish that combines all the qualities that have ever been demanded of a salt glazed product with imperviousness of face and a close color range in either light tan or dark mahogany.

Mottled Tile in several mottled finishes including Cream Brown, Cream White, Green, Blue and Blue Green.

Flat Colors of Black, Blue, Green and Cream Tinted White.

Caentile, unglazed, buff gray in color and thoroughly impervious.

Insets for decorative effects such as borders, panels, pilasters, etc., in a wide variety of colors in geometric designs.

Special Colors. We will be pleased to consult with any architect or engineer without obligation, in an endeavor to meet his particular needs in color or textures that can be produced in high fire glazes on vitrified clay bodies for any individual project.

Construction Features

AR-KE-TEX Tile combines many exclusive features of quality and construction.

Thorough vitrification of glaze and body.
Imperviousness of face.
Fire, acid, oil and grease resistant.
Insulating qualities.
Sanitary finish.
High bearing strength.
Low dead weight.
Indestructability and attractiveness of finish.
Wide choice of colors and textures.
Economy and rapidity of erection.
Permanence of color.
Readily cleaned with low maintenance cost.
Low relative cost.
Permanent beauty.

Wall Thicknesses

Wall Thicknesses which can be built with AR-KE-TEX Units:

Veneer: 3/4″, 1 3/8″, 1 7/8″ (exclusively of mortar backing).

Single-faced: 3 3/4″, 6″, 8″.

Double-faced: 4 1/4″, 6 1/4″, 8″, 10 1/4″, 12 1/4″, 16 1/2″.

Three-quarter inch Veneer is finished in flat stretchers only. All walls 4 1/4″ or thicker may be built of one color and texture on one face and of a different color and texture on the other face. The 5″x8″ Series will build only the thicknesses underlined.

Facilities and Service

AR-KE-TEX Tile is made in four plants with a total of 86 kiln capable of producing more than 40,000,000 tile or 8,000 carloads per year. All plants are located on trunk line railroads.

Ample stocks of standard units are maintained for prompt shipment.

The Company maintains at Indianapolis an Engineering Department ready at all times to assist the architect, engineer or contractor with quantity surveys, typical coursing layouts, or the solution of any construction problem, where AR-KE-TEX Tile may be involved.

Special sizes and shapes can be manufactured to meet unusual conditions.

Principal Uses

AR-KE-TEX Tile has been widely used for the interiors or exteriors of many different types of buildings, including:

Schools, for Auditoriums, Basements, Cafeterias, Class Rooms, Corridors, Domestic Science Rooms, Gymnasiums, Swimming Pools, Laboratories, Locker Rooms, Play Rooms, Shower Rooms, Toilets, Work Shops and Power Plants;

Field Houses
Office Buildings
Filtration Plants
Factories
Packing Houses
Dairies
Printing Plants
Service Stations
Comfort Stations
Country Clubs
Y. W. C. A.'s
Arenas
Airports
Penal Institutions
Infirmaries
Funeral Homes
Convents
Greenhouses
Granaries
Telephone Exchanges
Natatoriums
Steam Plants
Warehouses
Creameries
Bakeries
Department Stores
Laundries
Filling Stations
Tourist Camps
City Clubs
Armories
Municipal Buildings
Fire Stations
Insane Asylums
Hospitals
Cathedrals
Apartments
Refrigerating Plants
Hotels
Sub-stations
Boiler Rooms
Food Handling Plants
Ice Cream Plants
Restaurants
Store Buildings
Garages
Battery Rooms
Community Buildings
Y. M. C. A.'s
Theaters
Zoological Buildings
Police Stations
Homes for Aged
Orphanages
Churches
Residences
Abattoirs

Mottled Cream White

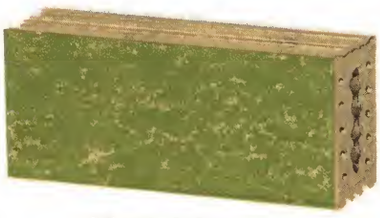
Cream Tinted White

Cream Buff Stippled

Insul-Glaz Light

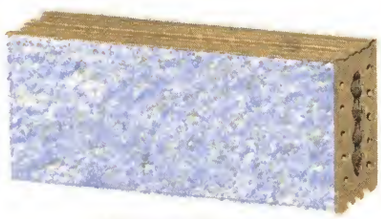
Caentile (Unglazed)

Dark Brown Insul-Glaz



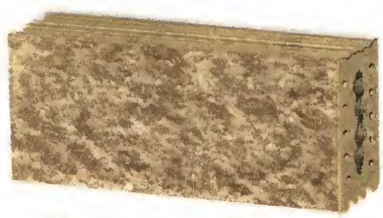
Mottled Green

Green Matt



Mottled Blue

Blue Matt



Mottled Cream Brown

Black Matt

STANDARD TEXTURES OF AR-KE-TEX TILE

Brick Displacement

AR-KE-TEX Tile displaces brick as follows:

one 5 x 8 x 12 equals 6 brick.
one 5 x 4 x 12 equals 3 brick.
one 5 x 4 x 8 equals 2 brick.

Crushing Strength: Approximately 3400 lbs. per sq. in. of gross bearing area.

WEIGHT OF WALL FOR COMPUTING DEAD LOADS

Wall Thickness in inches	AR-KE-TEX Weight per Sq. Ft. in Pounds	Brick Weight per Sq. Ft. in Pounds
4	35	43
8	60	84
12	95	125

The use of AR-KE-TEX Tile in place of brick makes possible a very considerable saving in reinforcing of floor, columns and footings.

Mortar Clinch

The half-inch round holes in the exterior webs of all horizontal cell stretchers, assure a definite mortar clinch in the vertical joints, an important factor in facing tile construction.

Mortar and Mortar Colors

AR-KE-TEX Tile may be laid in any kind of mortar made according to good practice with joint size and color to suit the individual taste of the designer or his client.

Cutting Tile

The installation of a portable electric saw with an abrasive disc for cutting AR-KE-TEX when necessary, is recommended on every project of any size. Our representative in every locality will gladly furnish any contractor with data on saws which have been found satisfactory. The use of these power saws has saved time and money for contractors on many recent projects, besides assuring excellent tile installations because of the precision with which mortises, mitres and odd lengths may be cut.

Double-Faced Walls

It is not recommended that double-faced walls be built of one tile unit extending through the wall, but rather of two units as shown in details on pages following. This procedure will permit of alignment of both faces at a cost no higher than would be necessary with two-faced sorting and gauging.

Tests

The testing laboratory of the University of Wisconsin has made a series of tests on AR-KE-TEX Tile. Copies of reports of these tests will be mailed on request.

Sorting, Packing and Shipping

AR-KE-TEX Tile are sorted for one face only, except shapes which are sorted for faces as marked on details. AR-KE-TEX Tile are packed in cars with extreme care, wrapped in indented paper or in corrugated strawboard cartons one or more to a package. Minimum carloads comprise:

2,800 pieces—5 x 8 x 12, or
5,000 pieces—5 x 4 x 12, or
6,500 pieces—5 x 4 x 8.

Samples

Full size or miniature samples of any standard texture of AR-KE-TEX Tile will be sent without charge to architects on request.

New Developments

The AR-KE-TEX Tile line is being constantly improved and increased with new colors and textures and new units. To supplement the information contained in this catalog and to keep architects and engineers up-to-date on our developments, a technical bulletin known as "BETTER WALLS," is published each month. To insure that you have this additional data, during the life of this catalog, The AR-KE-TEX Corporation or any of our distributors, will be pleased to put you on the mailing list for "BETTER WALLS," without obligation. When you are designing or specifying a project on which textured tile may be used, be sure you have the latest information.

When Specifying

Name areas where AR-KE-TEX Tile is to be used, whether interior or exterior or both.

State to what height tile is to be carried.

Designate color or combination of colors desired.

Mention face sizes that are desired, 5 x 12 or 5 x 8 or Random Ashlar.

State size of joint desired (we recommend ⅜"—see Course Height table.)

Designate whether closures (jambs, corners, sills and lintels) are to be square or bullnose.

State whether cove base and wainscot cap are desired and where.

Also if insets are desired, by pattern number and color combinations.

It is well to detail internal wall bond, either for two-faced AR-KE-TEX Tile walls or where AR-KE-TEX Tile is used in combination with other materials.

Quotations on Square Foot Basis

Quotations on square foot basis are now available as well as at unit prices or on lump sum guarantee.

By the square foot method, the contractor can price his quantity survey in his own construction terms and we then adapt our units to his requirements. This method eliminates any confusion for the contractor, and he avoids the differential that is necessary to include in lump sum guarantees. Furthermore, this method of selling permits the architect to specify AR-KE-TEX Tile at a definite price per square foot of the several types of walls in his project. (The differential for closures, caps, coves, etc., is the same for all textures.) The choice of texture, color and even quality is then his or his client's at a definite cost or saving. This is similar to the method most generally used in specifying our contemporary, face brick.

RANDOM ASHLAR COURSING

To those architects who may consider standard brick or tile coursings monotonous in larger wall areas or whose project demands the unusual in wall effects, Random Ashlar Coursing offers a pleasing diversification.

The illustration above shows a wall in Random Ashlar Bond VI, with two inset designs in colors. In Random Ashlar Bond VI, the introduction of occasional double-height tile in 12, 8 and 4-inch lengths, together with 4 and 8-inch lengths of standard height stretchers, is all that is necessary to produce this unusual wall effect in AR-KE-TEX Tile.

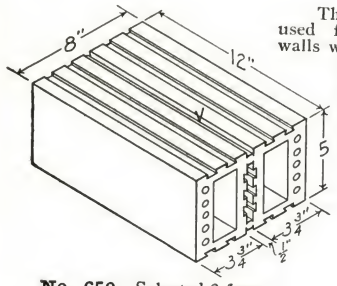
Original and striking wall effects may be created economically with this material, because unlimited combinations are possible using only standard stock units.

SOME RECENT PROJECTS USING AR-KE-TEX TILE

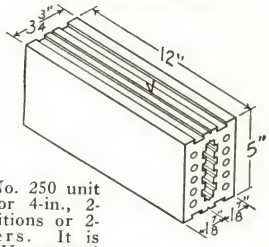
BUILDING AND LOCATION	ARCHITECT
Power Plant, U. S. Bureau of Standards, Washington, D. C.	W. I. Deming
11 Substations, Duquesne Light Co., Pittsburgh, Pa.	Byllesby Engineering & Management Corp.
Power Plant, Wisconsin Power & Light Co,. Sheboygan, Wis.	Sargent & Lundy
Cleveland Electric Illuminating Co., Power Plant, Avon, Ohio	Private Plans
Power Plant, Ashtabula, Ohio	Dickerson & Rhoads
Indianapolis Power & Light Co., Power Plant and Substations	Management & Engineering Corp.
Beauharnois Power Co., Ltd., Montreal, Que.	W. S. Lee Engineering Co.
Safe Harbor Waterpower Corp. Plant, Safe Harbor, Pa.	M. R. Baker
New York Times Printing Plants	Albert Kahn, Inc.
Michigan Bell Telephone Co., Detroit, Mich., West Fort Street Substation	Smith, Hinchman & Grylls
LaCrosse Telephone Co., LaCrosse, Wis.	Wells E. Bennett
Campbell Soup Co., Manufacturing Building and Power House, Camden, N. J.; Manufacturing Building, Warehouse and Power House, Chicago, Ill.	Battey & Kipp
Hercules Powder Co. Laboratory, Hercules, Del.	Hercules Power Co.
DuPont Powder Co. Cafeteria, Wilmington, Del.	DuPont Engineering Co.
York Filtration Plant, York, Pa.	Palmer & Lamdin
Sewage Pumping Station, Dayton, Ohio	Dayton City Architect
Public Baths, Winnipeg, Man.	Pratt & Ross
Swimming Pool, Bellerive Country Club, St. Louis, Mo.	W. J. Knight & Co.
Park Plaza Hotel, St. Louis, Mo.	Lawrence & Schopp and Edwin T. Bauman
Charlotte Country Club, Charlotte, N. C.	Aymar Embury
Boys Club, Portland, Me.	John Calvin & John Howard Stevens
Michigan State Hospital, Urania, Mich.	Albert Kahn, Inc.
Grace Hospital, Detroit, Mich.	Albert Kahn, Inc.
St. Joseph Hospital, Milwaukee, Wis.	E. Brielmaier & Sons Co.
Veterans Hospital, Norman, Okla.	Albert S. Ross
Hospital, Newton, Conn.	Walter P. Crabtree
Tuberculosis Hospital, Waltham, Mass.	James H. Ritchie & Assoc.
Edwin Denby Memorial Home, Detroit, Mich.	Geo. W. Graves
St. Joseph Nurses' Home, Detroit, Mich.	Donaldson & Meier

BUILDING AND LOCATION	ARCHITECT
Hospital and Training School, Manchester, Conn.	Towner & Sellew
Middlesex County House of Correction, Billerica, Mass.	Charles R. Greco
Franklin & Marshall College, Engineering Building, Lancaster, Pa.	Chas. Z. Klauder
LaFayette College, Engineering Building, Easton, Pa.	Chas. Z. Klauder
Villa Nova College, Commerce Building, Villa Nova, Pa.	Paul Monaghan
Phillips Exeter Academy, Science Building, Exeter, N. H.	Cram & Ferguson
Brooklyn Technical High School, Brooklyn, N. Y.	Walter C. Martin
Harbord & Humberside Collegiate Institutes, Toronto, Ont.	C. E. Dyson
Horace Mann High School, Gary, Ind.	Wm. B. Ittner, Inc.
Roosevelt High School, Gary, Ind.	Wm. B. Ittner, Inc.
Lew Wallace High School, Gary, Ind.	Wm. B. Ittner, Inc.
5 Public Schools, Springfield, Mo.	Wm. B. Ittner, Inc.
Lansdown and State Street High Schools, East St. Louis, Ill.	N. S. Spencer & Son and J. W. Kennedy
Thomas Jefferson High School, San Antonio, Tex.	Adams & Adams
Woodrow Wilson High School, Middletown, Conn.	Towner & Sellew
Charles Sumner School, Brighton, Mass.	Dana Somes
Super-Service Station, Colonial Oil Co., Grand Rapids, Mich.	Pierre Lindhout
Woodside School, Bay City, Mich.	Jos. C. Goddeyne
Hillsdale School, Hillsdale, Mich.	Warren S. Holmes Co.
Smouse School, Des Moines, Iowa	Proudfoot, Rauson & Souers
Southern Dairies, Milk Plant, Asheville, N. C.	Ronald Greene
High School, Albert Lea, Minn.	Nedved & Fellows
Brooklyn Technical High School, Brooklyn, N. Y.	W. C. Martin
Bronx Continuation School, New York, N. Y.	W. C. Martin
Office Building, Union Gas & Electric Co., Cincinnati, Ohio	Garber & Woodward
Eaker Street Steam Station, Dayton, Ohio	Columbia Engineering & Management Co.
Swedish Hospital, Minneapolis, Minn.	Magney & Tusler
Escanaba Junior High School, Escanaba, Mich.	Henry H. Turner

5x12 SERIES



The No. 650 unit is used for 4-in. partition walls which must be plastered on back face. The tile are double kerfed for splitting at point marked V, top and bottom



The No. 250 unit is used for 4-in., 2-faced partitions or 2-in. veneers. It is kerfed at V, top and bottom

No. 650—Selected 2 faces.
No. 800—Selected 1 face.
Standard Stretcher.

Standard Short Lengths

2	in. L—	652	Selected 2 faces
		802	Selected 1 face
3⅞	in. L—	654	Selected 2 faces
		804	Selected 1 face
5⅞	in. L—	656	Selected 2 faces
		806	Selected 1 face
8	in. L—	658	Selected 2 faces
		808	Selected 1 face
10	in. L—	650	Selected 2 faces
		810	Selected 1 face

No. 250—Selected 2 faces.
No. 400—Selected 1 face.
Standard Stretcher.

Standard Short Lengths

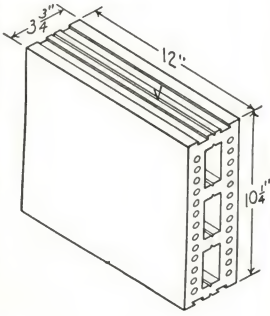
2	in. L—	252	Selected 2 faces
		402	Selected 1 face
3⅞	in. L—	254	Selected 2 faces
		404	Selected 1 face
5⅞	in. L—	256	Selected 2 faces
		406	Selected 1 face
8	in. L—	258	Selected 2 faces
		408	Selected 1 face
10	in. L—	250	Selected 2 faces
		410	Selected 1 face

No. 900
Double Height Stretcher

This tile is designed principally for use in Random Ashlar Coursing, but can also be furnished for solid coursings for wainscots, etc. by special arrangement.

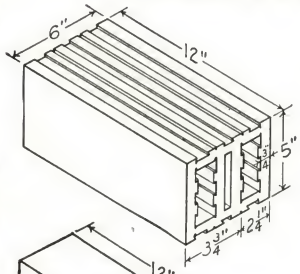
This unit is furnished kerfed at V for 2-in. veneer, but is selected for 2 faces on special arrangement only.

Closure units marked with * shown in this catalogue are also furnished in 10¼-in. heights



Standard Short Lengths

3⅞ in. L—No. 904
5⅞ in. L—No. 906
8 in. L—No. 908



No. 60
5x6x12-in. Stretcher

Nos. 64, 66, 68, standard 4, 6, and 8-in. short lengths.

Selected for one 5x12-in. face.

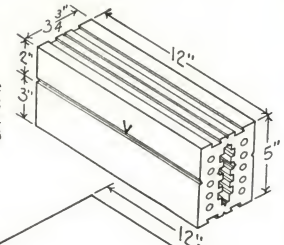
From this unit can be split 5x12x¾-in. slabs for extra thin veneer when specially required.

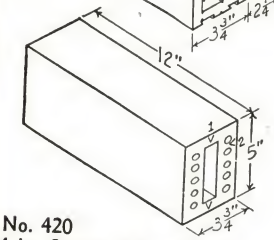
2-face selection is obtainable by special arrangement

No. 400 S. H.
Short Height Stretcher

(Kerfed for splitting at V)

For use in the occasional place that standard stretchers will not fit; for instance under beams the depth of which does not permit full courses to conform to adjacent walls



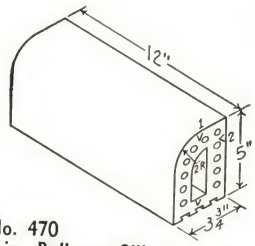


No. 420
4-in. Square Sill or Lintel

Nos. 424, 426, 428, standard 4, 6 and 8-in. short lengths.

No. 420K, kerfed at V-V1.

No. 420SK, kerfed at V-V2

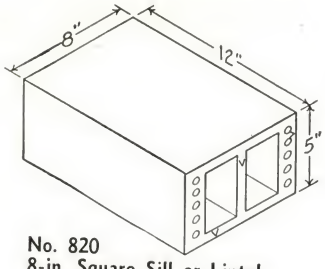


No. 470
4-in. Bullnose Sill or Lintel

Nos. 474, 476, 478, standard 4, 6, and 8-in. short lengths.

No. 470K, kerfed at V-V1.

No. 470SK, kerfed at V-V2

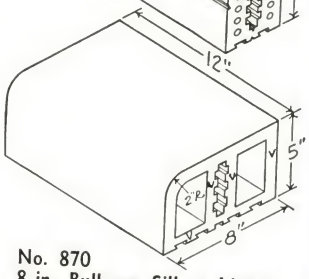


No. 820
8-in. Square Sill or Lintel

Nos. 824, 826, 828, standard 4, 6, and 8-in. short lengths.

No. 820K, kerfed at V-V.

Selected for 2 adj. faces

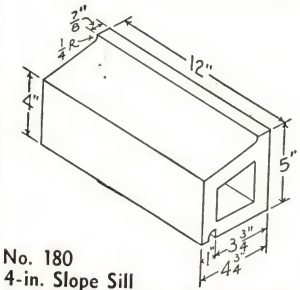


No. 870
8-in. Bullnose Sill or Lintel

Nos. 874, 876, 878, standard 4, 6, and 8-in. short lengths.

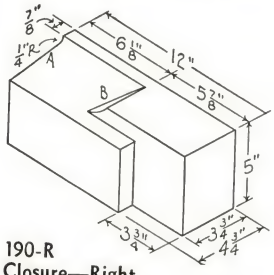
No. 870K, kerfed at V-V.

Selected for 2 faces adj. to B/N only



No. 180
4-in. Slope Sill

Nos. 184, 186, 188, standard 4, 6, and 8-in. short lengths.

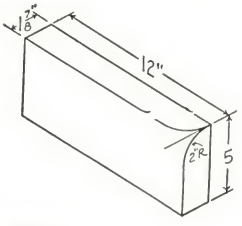


No. 190-R
Lug Closure—Right

(For projecting slope sill.)

No. 190-L, left hand.

By cutting this unit between A and B, short lengths of No. 180 can be eliminated.

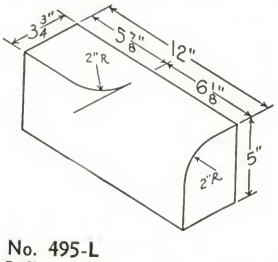


No. 490-L
Bullnose Starter—Left

(Use where B/N Jamb meets B/N Sill or Lintel.)

No. 490-R, right hand.

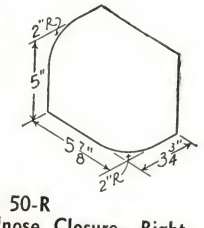
Selected for 1 face shown.



No. 495-L
Bullnose Starter—Left

(Joins B/N Jamb with B/N Sill or Lintel)

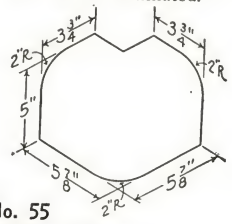
No. 495-R, right hand



No. 50-R
Bullnose Closure—Right

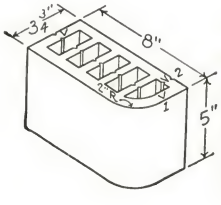
(Use for Bullnose Stretcher or for sill or lintel tile when used as coping or cap.)

No. 50-L, left hand



No. 55
Bullnose Corner

(Use for Bullnose tile when used as coping or cap)



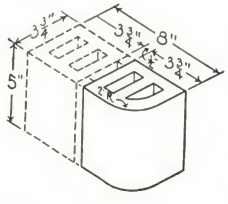
No. 105*
Header Bullnose

No. 100*, square.

Selected for faces adj. to B/N.

No. 105K, No. 100K, kerfed at V-V1.

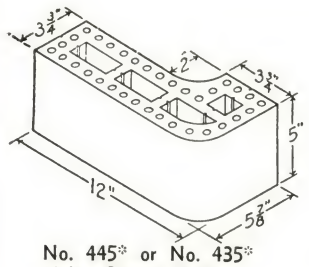
No. 105SK, No. 100SK, kerfed at V-V2



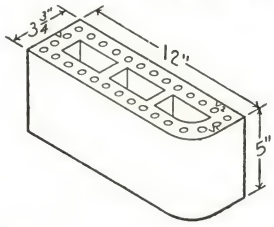
No. 165*
Half Header Bullnose

No. 160*, square.

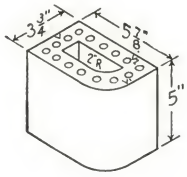
5x12 SERIES



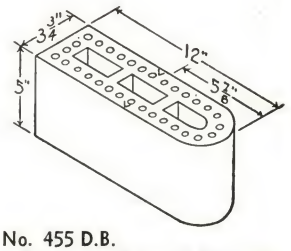
No. 445* or No. 435*
4-in. Corner Bullnose
No. 445 for External.
No. 435 for Internal.
No. 440*, External Square



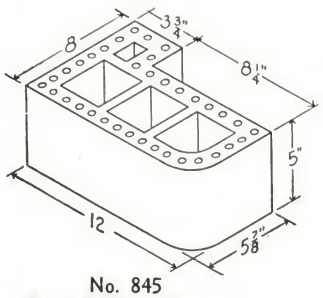
No. 455*
4-in. Full Jamb Bullnose
No. 450*, 4-in. Full Jamb Square.
Nos. 455K, 450K, kerfed at V-V1.
Nos. 455SK, 450SK, kerfed at V-V2



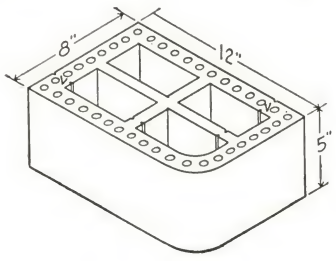
No. 465*
4-in. Half Jamb Bullnose
No. 460*, 4-in. Half Jamb Square.
Nos. 465K, 460K, kerfed at V-V1.
Nos. 465SK, 460SK, kerfed at V-V2



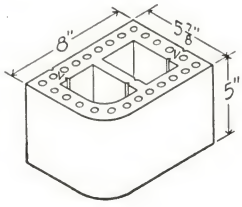
No. 455 D.B.
Double Bullnose 4-in. Full Jamb
Selected for 3 faces adj. to B/N.
No. 465 D.B. for Half Jamb (kerfed at V-V for splitting).
Use for 4-in. 2 faced walls without jamb frames or casings



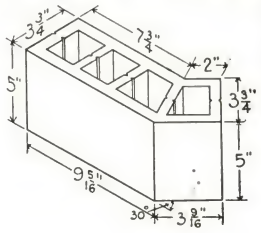
No. 845
8-in. Bullnose Corner
No. 840, Square Corner.
Selected for 2 faces adj. to B/N



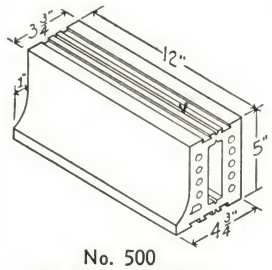
No. 855
8-in. Full Jamb Bullnose
No. 850, 8-in. Square Full Jamb.
Nos. 855K, 850K, kerfed at V-V.
Selected for 2 faces adj. to B/N



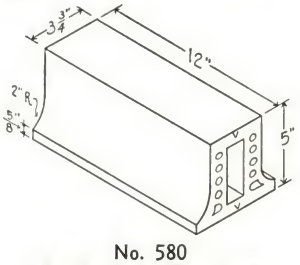
No. 865
8-in. Half Jamb Bullnose
No. 860, 8-in. Square Half Jamb.
Nos. 865K, 860K, kerfed at V-V.
Selected for 2 faces adj. to B/N



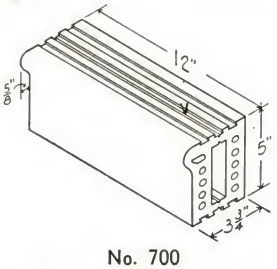
No. 480—Ext. or Int.
Octagon Corner
Selected for either external or internal as specified



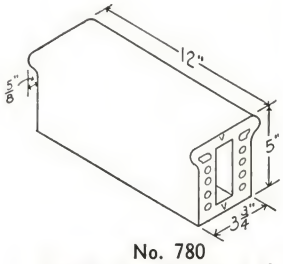
No. 500
Cove Base Stretcher
Nos. 502, 504, 506, 508, standard 2, 3⅞, 5⅞ and 8-in. short lengths.
Kerfed at V for 2-in. Veneer.
Finished 1 face only.
No. 520, smooth top and face.
No. 520K, kerfed



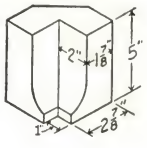
No. 580
Double Face Cove Base Stretcher
Nos. 584, 586, 588 standard 4, 6, and 8-in. short lengths.
Kerfed at V-V for splitting.
Selected for 2 opposite faces only



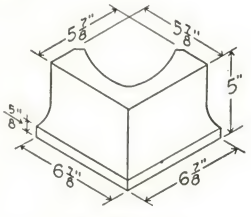
No. 700
Wainscot Cap Stretcher
Nos. 702, 704, 706, 708, 710 standard 2, 3⅞, 5⅞, 8 and 10-in. short lengths.
Kerfed at V for splitting.
Finished 1 face only.
No. 720, smooth top and face.
No. 720K, kerfed



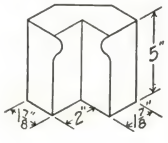
No. 780
Double Face Wainscot Cap Stretcher
Nos. 784, 786, 788 standard 4, 6, and 8-in. short lengths.
Kerfed at V-V for splitting.
Selected for 2 opposite faces only



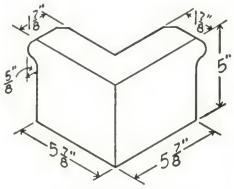
No. 530—Int.
Internal Square Corner for Cove Base



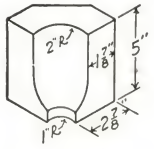
No. 530—Ext.
Exterior Square Corner for Cove Base



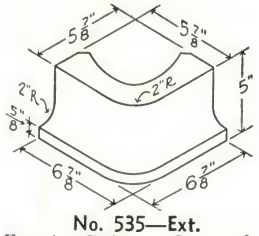
No. 730—Int.
Internal Square Corner for Wainscot Cap



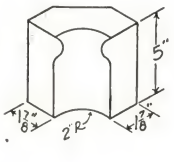
No. 730—Ext.
Exterior Square Corner for Wainscot Cap



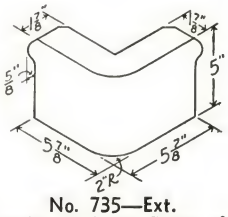
No. 535—Int.
Internal Cove Corner for Cove Base



No. 535—Ext.
Exterior Bullnose Corner for Cove Base

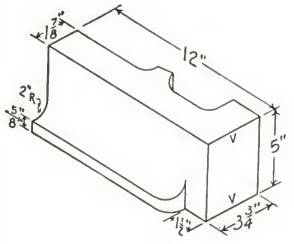


No. 735—Int.
Internal Cove Corner for Wainscot Cap



No. 735—Ext.
Exterior Bullnose Corner for Wainscot Cap

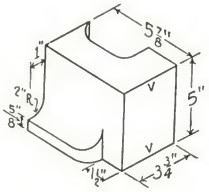
5x12 SERIES



No. 550-R
Cove Stop—Right—12 In.

Furnished also in left, 12 in., No. 550-L.

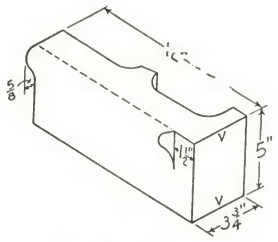
Furnished also kerfed at V-V. Right, No. No. 550RK; left, No. 550LK



No. 560-R
Cove Stop—Right—6 In.

Furnished also in left, 6 in., No. 560-L.

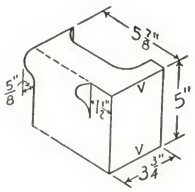
Furnished also kerfed at V-V. Right, No. 560RK; left, No. 560LK



No. 750-R
Cap Stop—Right—12 In.

Furnished also in left, 12 in., No. 750-L.

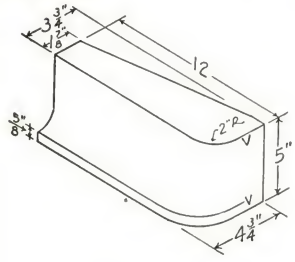
Furnished also kerfed at V-V. Right, No. 750RK; left, No. 750LK



No. 760-R
Cap Stop—Right—6 In.

Furnished also in left, 6 in., No. 760-L.

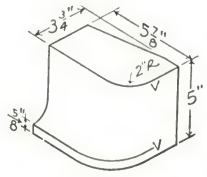
Furnished also kerfed at V-V. Right, No. 760RK; left, No. 760LK



No. 555-R
Cove Stop Bullnose—
Right—12 In.

Furnished also in left, 12 in., No. 555-L.

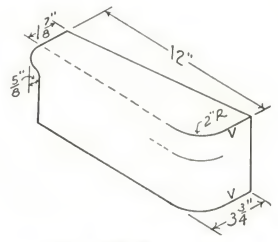
Furnished also kerfed at V-V. Right, No. 555RK; left, No. 555LK



No. 565-R
Cove Stop Bullnose—
Right—6 In.

Furnished also in left, 6 in., No. 565-L.

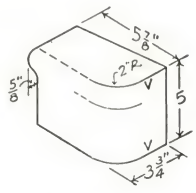
Furnished also kerfed at V-V. Right, No. 565RK; left, No. 565LK



No. 755-R
Cap Stop Bullnose—Right
12 In.

Furnished also in left, 12 in., No. 755-L.

Furnished also kerfed at V-V. Right, No. 755RK; left, No. 755LK

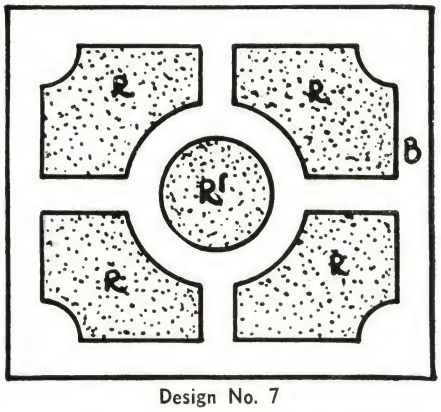


No. 765-R
Cap Stop Bullnose—Right
6 In.

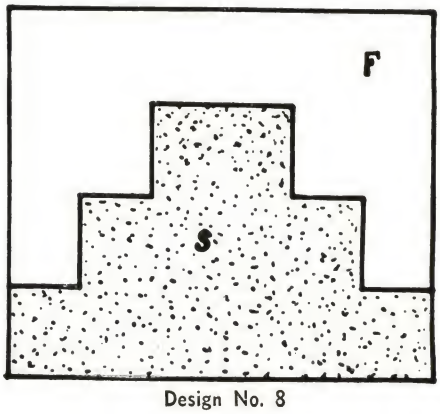
Furnished also in left, 6 in., No. 765-L.

Furnished also kerfed at V-V. Right, No. 765RK; left, No. 765LK

INSETS

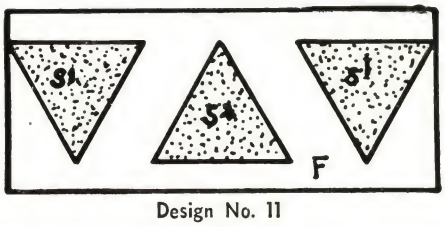


Design No. 7

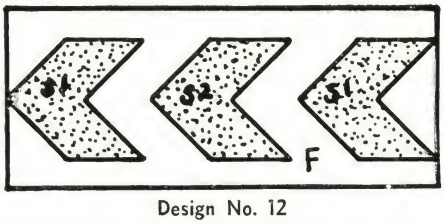


Design No. 8

BORDERS



Design No. 11

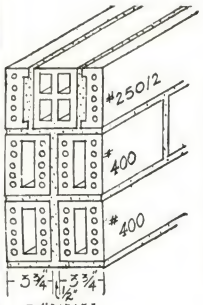


Design No. 12

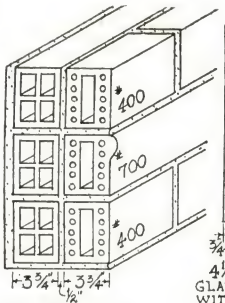
Colored insets of AR-KE-TEX Tile can be successfully used in the most elaborate or the most simply conceived decorative schemes for either interior or exterior walls of any building at a very reasonable cost.

While only four inset designs are shown here, more than a dozen stock designs are available in standard color combinations, in sizes from 5x4 in. to 10x12 in. Special designs, too, will be quoted on request.

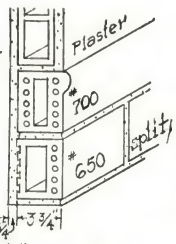
5x12 SERIES



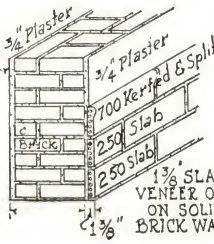
8" WALL
FACED TWO SIDES



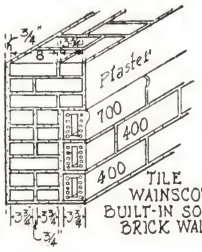
8" TILE WALL
ONE FACE GLAZED
ONE FACE PLASTERED



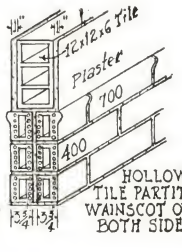
4½" PARTITION
GLAZED WAINSCOT
WITH PLASTER ABOVE
ON ONE FACE
PLASTER THROUGHOUT
ON OTHER FACE



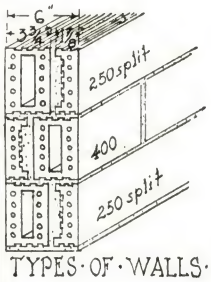
1⅜" SLAB
VENEER ON
SOLID
BRICK WALL

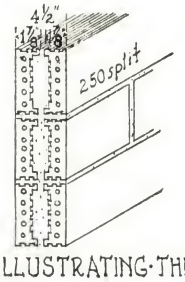


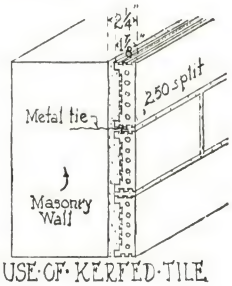
TILE
WAINSCOT
BUILT-IN SOLID
BRICK WALL



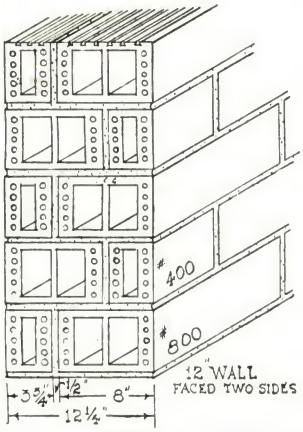
HOLLOW
TILE PARTITION
WAINSCOT ON
BOTH SIDES



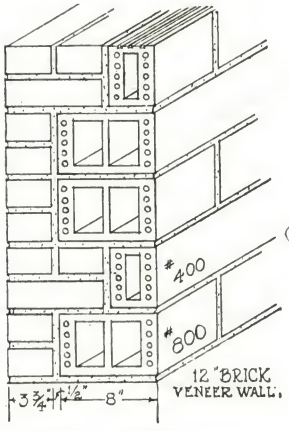




TYPES OF WALLS ILLUSTRATING THE USE OF KERFED TILE

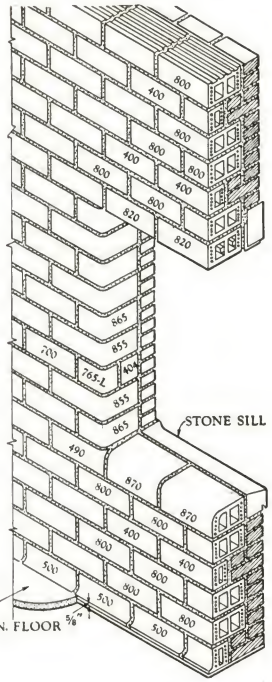


12" WALL
FACED TWO SIDES

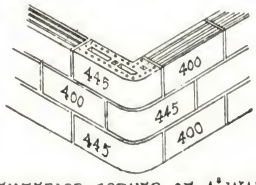


12" BRICK
VENEER WALL

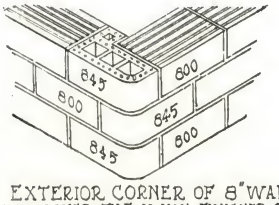
TYPES OF WALLS AND WALL BONDS



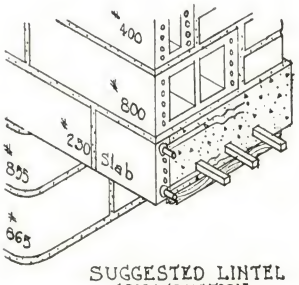
A. TYPICAL BRICK
VENEER WALL
SECTION



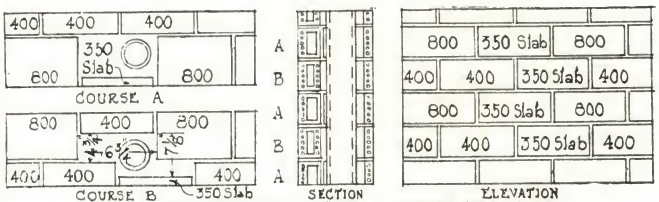
EXTERIOR CORNER OF 4" WALL
THIS CORNER TILE IS NOT FINISHED ON
8¼" x 5" OR 2¼" x 5" FACE



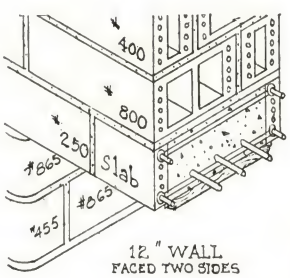
EXTERIOR CORNER OF 8" WALL
THIS CORNER TILE IS NOT FINISHED ON
3½" x 5" FACE.



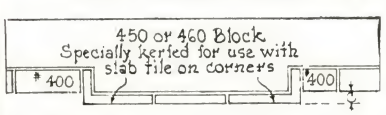
SUGGESTED LINTEL
CONSTRUCTION
USING SLAB-TILE, DOWEL-PINS
AND WIRE-TIES



CHASE CONSTRUCTION IN 12" WALL FACED TWO SIDES



12" WALL
FACED TWO SIDES



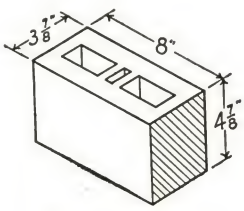
USE OF SLAB TILE AS COLUMN
VENEER TO REDUCE PILASTER
WIDTH & WIDTH OF PROJECTION
C = 1⅞"

COURSES IN HEIGHT

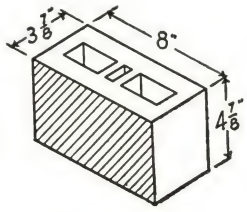
5x8 Series	5/8-in. joint	½-in. joint	3/8-in. joint	¼-in. joint
5x12 Series	½-in. joint	3/8 in. joint	¼-in. joint	
	ft. in.	ft. in.	ft. in.	ft. in.
1	0 5½	0 5⅜	0 5¼	0 5⅛
2	0 11	0 10¾	0 10½	0 10¼
3	1 4½	1 4⅛	1 3¾	1 3⅜
4	1 10	1 9½	1 9	1 8½
5	2 3½	2 2⅞	2 2¼	2 1⅝
6	2 9	2 8¼	2 7½	2 6¾
7	3 2½	3 1⅝	3 0¾	2 11⅞
8	3 8	3 7	3 6	3 5
9	4 1½	4 0⅜	3 11¼	3 10⅛
10	4 7	4 5¾	4 4½	4 3¼
11	5 0½	4 11⅛	4 9¾	4 8⅜
12	5 6	5 4½	5 3	5 1½
13	5 11½	5 9⅞	5 8¼	5 6⅝
14	6 5	6 3¼	6 1½	5 11¾
15	6 10½	6 8⅝	6 6¾	6 4⅞
16	7 4	7 2	7 0	6 10
17	7 9½	7 7⅜	7 5¼	7 3⅛
18	8 3	8 0¾	7 10½	7 8¼
19	8 8½	8 6⅛	8 3¾	8 1⅜
20	9 2	8 11½	8 9	8 6½
21	9 7½	9 4⅞	9 2¼	8 11⅝
22	10 1	9 10¼	9 7½	9 4¾
23	10 6½	10 3⅝	10 0¾	9 9⅞
24	11 0	10 9	10 6	10 3
25	11 5½	11 2⅜	10 11¼	10 8⅛
26	11 11	11 7¾	11 4½	11 1¼
27	12 4½	12 1⅛	11 9¾	11 6⅜
28	12 10	12 6½	12 3	11 11½
29	13 3½	12 11⅞	12 8¼	12 4⅝
30	13 9	13 5¼	13 1½	12 9¾
31	14 2½	13 10⅝	13 6¾	13 2⅞
32	14 8	14 4	14 0	13 8
33	15 1½	14 9⅜	14 5¼	14 1⅛
34	15 7	15 2¾	14 10½	14 6¼
35	16 0½	15 8⅛	15 3¾	14 11⅜
36	16 6	16 1½	15 9	15 4½
37	16 11½	16 6⅞	16 2¼	15 9⅝
38	17 5	17 0¼	16 7½	16 2¾
39	17 10½	17 5⅝	17 0¾	16 7⅞
40	18 4	17 11	17 6	17 1
41	18 9½	18 4⅜	17 11¼	17 6⅛
42	19 3	18 9¾	18 4½	17 11¼
43	19 8½	19 3⅛	18 9¾	18 4⅜
44	20 2	19 8½	19 3	18 9½
45	20 7½	20 1⅞	19 8¼	19 2⅝
46	21 1	20 7¼	20 1½	19 7¾
47	21 6½	21 0⅝	20 6¾	20 0⅞
48	22 0	21 6	21 0	20 6
49	22 5½	21 11⅜	21 5¼	20 11⅛
50	22 11	22 4¾	21 10½	21 4¼
51	23 4½	22 10⅛	22 3¾	21 9⅜
52	23 10	23 3½	22 9	22 2½
53	24 3½	23 8⅞	23 2¼	22 7⅝
54	24 9	24 2¼	23 7½	23 0¾
55	25 2½	24 7⅝	24 0¾	23 5⅞
56	25 8	25 1	24 6	23 11
57	26 1½	25 6⅜	24 11¼	24 4⅛
58	26 7	25 11¾	25 4½	24 9¼
59	27 0½	26 5⅛	25 9¾	25 2⅜
60	27 6	26 10½	26 3	25 7½

Notes: If cove base tile is used with 5x12 Series deduct 1⅛ in. from figures shown in above table, for heights from *finished* floorline. For window opening heights add thickness of one mortar joint.

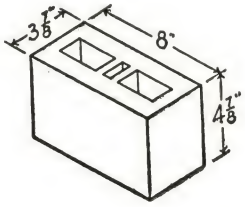
5x8 SERIES



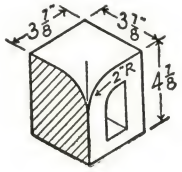
No. 100—Stretcher



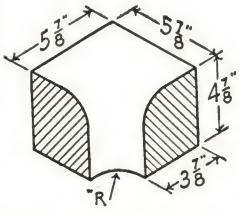
No. 101—Header



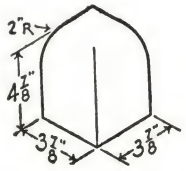
No. 102—Quoin



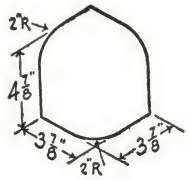
No. 51—Bullnose Coping Corner, Internal Square



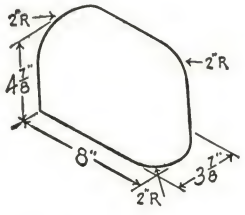
No. 52—Bullnose Coping Corner Internal, Round



No. 56—Bullnose Coping Corner, External, Square

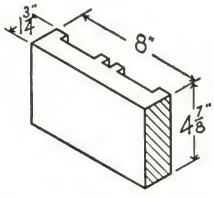


No. 57—Bullnose Coping Corner, External, Round

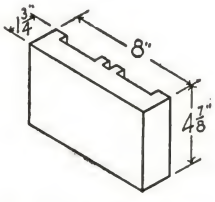


No. 58—Double B/N Coping Round Stop

No. 54, same—3⅞ in. long

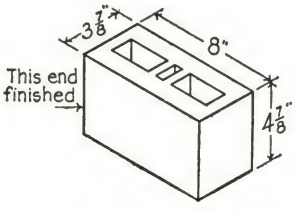


No. 100-K—Soap Stretcher

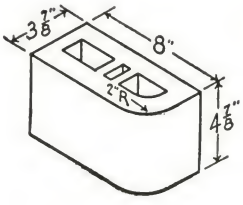


No. 102-K—Quoin Soap

Also furnished in 3⅞ and 5⅞-in. lengths

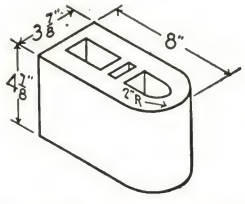


No. 103—Double Quoin



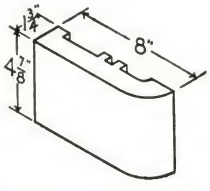
No. 105—Bullnose Closure

Also No. 165, Bullnose Closure Bat—3⅞ in. long



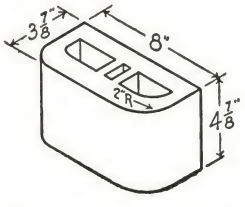
No. 105-D—Double Bullnose Closure

Also No. 165D, Double Bullnose Closure Bat—3⅞ in. long

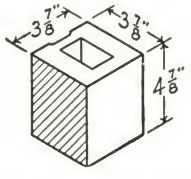


No. 105-K—Soap Bullnose Closure

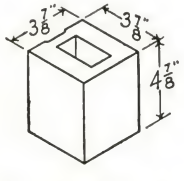
Also No. 165K, same—3⅞ in. long



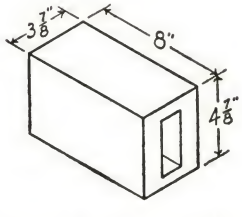
No. 106—Double Bullnose



No. 161—Header Bat

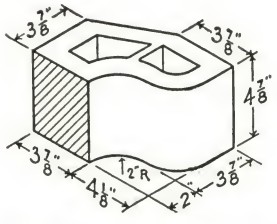


No. 162—Quoin Bat

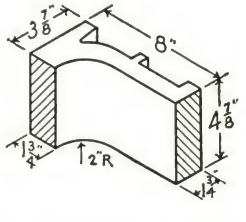


No. 428—Square Sill (or Lintel) Stretcher

Also No. 424, same—3⅞ in. long

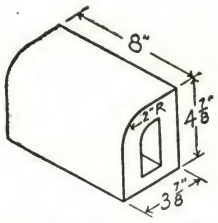


No. 432—External—Internal Bullnose Combination

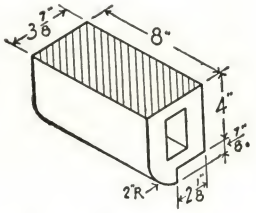


No. 438—Internal Bullnose

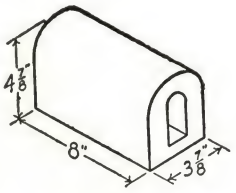
5x8 SERIES



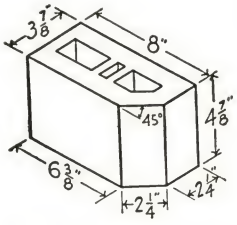
No. 478—Bullnose Sill (or Lintel) Stretcher
Also No. 474, same—3⅞ in. long



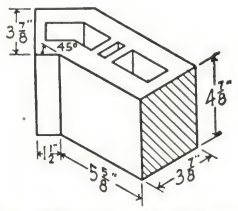
No. 478A—Recessed Bullnose Lintel Stretcher
Also No. 474A, same—3⅞ in. long



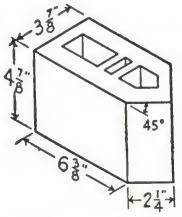
No. 478D—Double Bullnose Sill Stretcher
Also No. 474D, same—3⅞ in. long



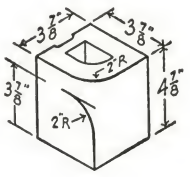
No. 483—Chamfer Corner



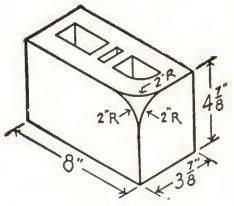
No. 485—Internal Octagon



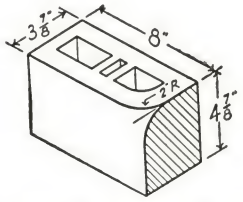
No. 486—External Octagon



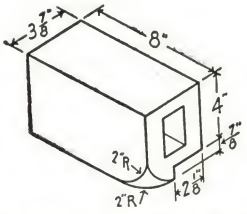
No. 491R—Bullnose Flatter Sill and Jamb Mitre, Right
Also No. 491L, same—left



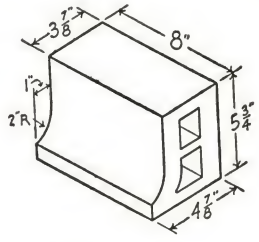
No. 492L—Bullnose Square Starter, Left
Also No. 492R, same—right



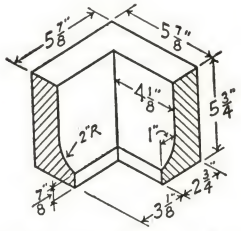
No. 498L—Bullnose Sill (or Lintel) Starter
Also No. 498R, same—right. Also furnished in 3⅞-in. length, No. 494L and No. 494R



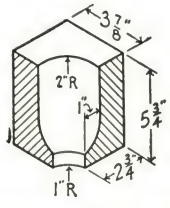
No. 498AL—Recessed Bullnose Lintel Starter, Left
Also No. 498AR, same—right. Also furnished in 3⅞-in. length, No. 494AL and No. 494AR.



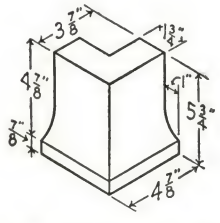
No. 508—Cove Stretcher
Also No. 504, same—3⅞ in. long



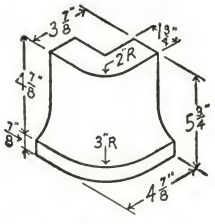
No. 531—Cove Internal Corner, Square



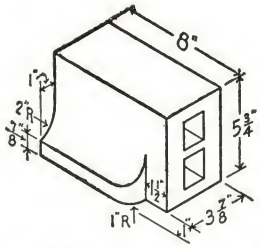
No. 532—Cove Internal Corner, Bullnose



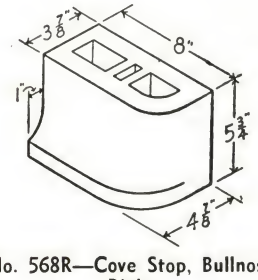
No. 536—Cove External Corner, Square



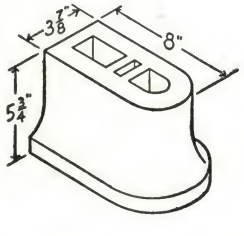
No. 537—External Corner, Bullnose



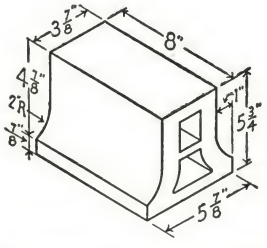
No. 558R—Cove Stop, Right
Also No. 558L, same—left



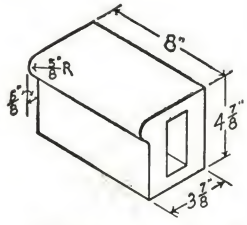
No. 568R—Cove Stop, Bullnose Right
Also No. 568L, same—left



No. 568D—Double Cove Stop, Bullnose
Also No. 564D, same—3⅞ in. long

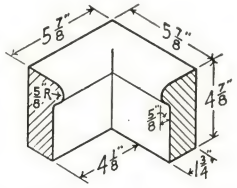


No. 588—Double Cove Stretcher
Also No. 584, same—3⅞ in. long

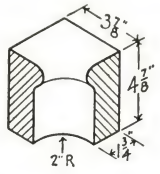


No. 708—Cap Stretcher
Also No. 704, same—3⅞ in. long

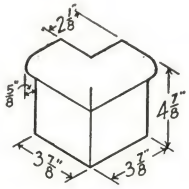
5x8 SERIES



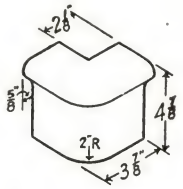
No. 731—Cap, Internal Corner, Square



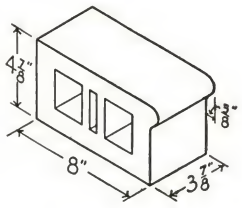
No. 732—Cap, Internal Corner, Bullnose



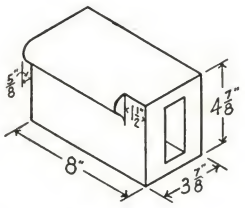
No. 736—Cap, External, Corner, Square



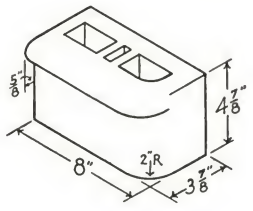
No. 737—Cap, External Corner, Bullnose



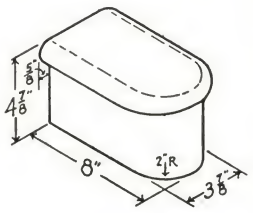
No. 744—Cap Header



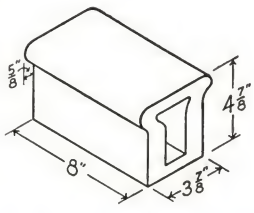
No. 758R—Cap Stop, Square, Right
Also No. 758L, same—left



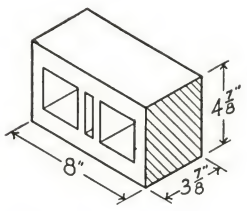
No. 768R—Cap Stop, Bullnose, Right
Also No. 768L, same—left



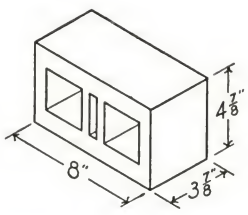
No. 768D—Double Cap Stop, Bullnose
Also No. 764D, same—3⅞ in. long



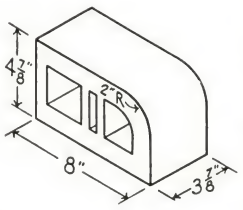
No. 788—Double Cap Stretcher
Also No. 784, same—3⅞ in. long



No. 814—Flatter Stretcher



No. 824—Flatter Quoin

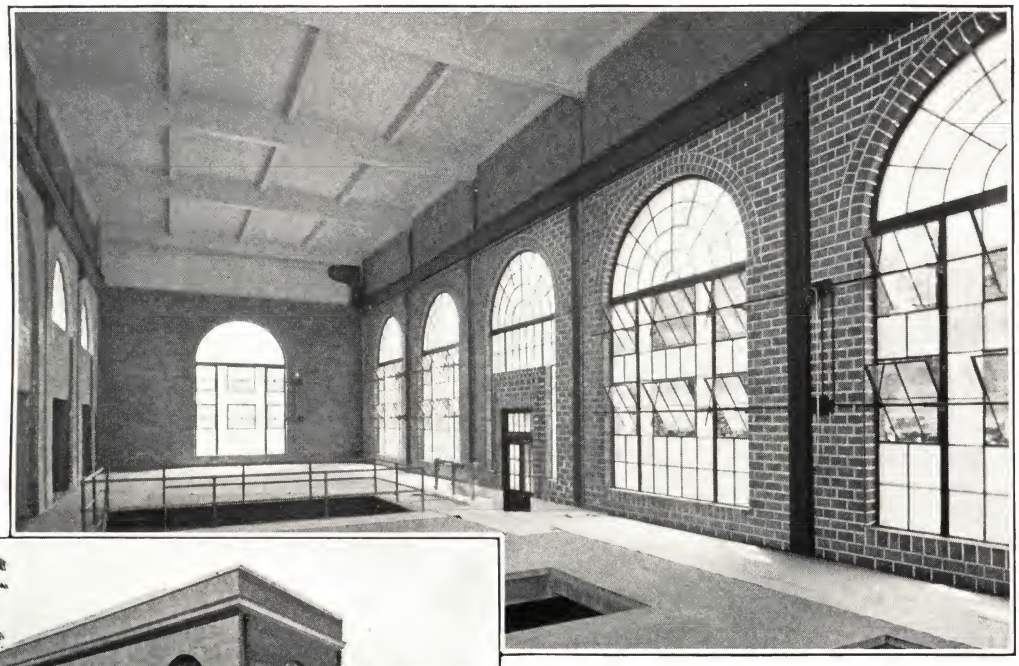


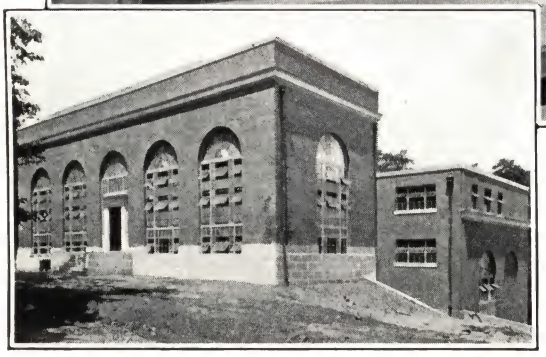
No. 874—Flatter Header, Bullnose

AR-KE-TEX Tile Inside and Out

The Arena Building, St. Louis, Mo., where Ar-Ke-Tex Tile was used for all walls on both exterior and interior. Architects were Sohrman-Kiewitt-Hollingsworth. General Contractors, The Boaz-Kiel Construction Company

TYPICAL INSTALLATIONS OF AR-KE-TEX TILE





ABOVE: Interior view of Power Plant at U. S. Bureau of Standards, Washington, D. C., showing AR-KE-TEX Tile in walls.

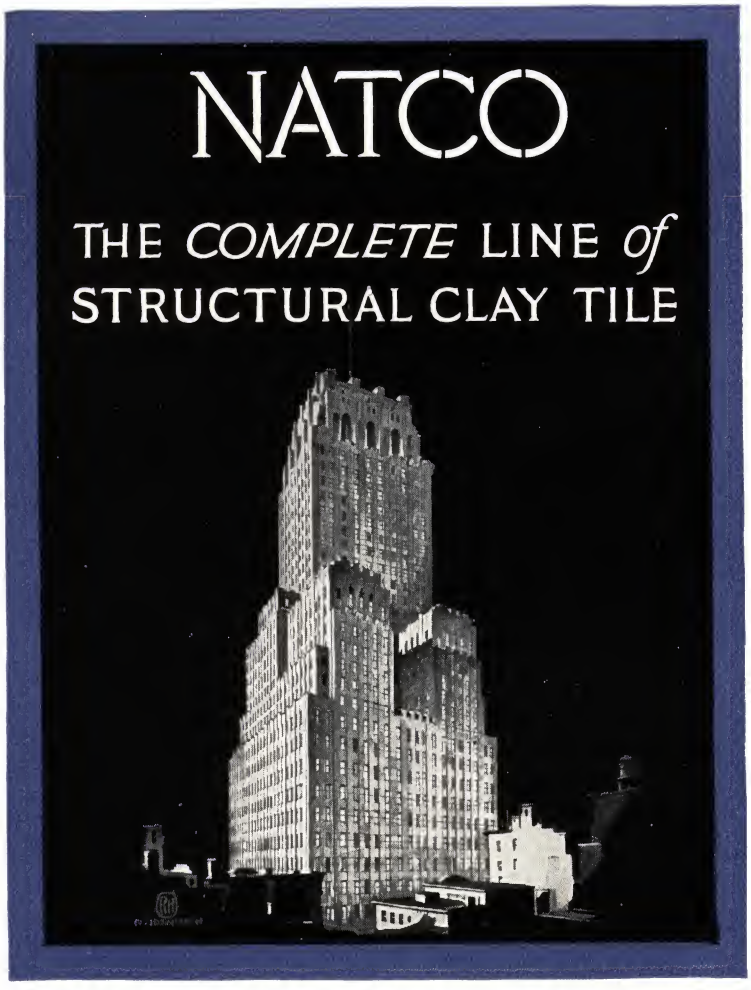
AT LEFT: Exterior view of U. S. Bureau of Standards Power Plant. W. I. Deming, Architect, Washington, D. C.

Interior of Pachyderm House, Detroit Zoological Park. Designed by Henry T. Morris, Superintendent, with Donaldson & Meier as consulting architects. Mottled Cream Brown AR-KE-TEX Tile was used as a base color with Mottled Cream White as a trim; various size standard units were laid in Random Ashlar Bond.

AR-KE-TEX
ART-KERAMIC-TEXTURES
THE STANDARD OF TEXTURED TILE

NATCO

THE *COMPLETE* LINE *of*
STRUCTURAL CLAY TILE



Represented by

NATIONAL·FIREPROOFING
·CORPORATION·

General Offices: Fulton Building, Pittsburgh, Penna.

NATCO PRODUCTS INDEX

INTERIOR WALLS

Natco Vitritile.....Pages 4 to 26 inc.

A particularly attractive load bearing, structural tile for interior walls and partitions—also furnished kerfed or split for furring. Available in salt glaze, or the new fritted glaze, in a wide range of charming colors. (See color charts.) Beautifully glazed, sanitary, easily cleaned—eliminates the necessity of plastering or painting.

Natco Partition Tile.....Page 44

Light, strong, easily and economically laid. Fireproof, indestructible, resists the passage of cold, heat and sound.

Natco Furring Tile.....Page 39

Applied to the interior of exterior walls—prevents dampness from penetrating and discoloring plaster.

Natco Vitribrik.....Pages 27 and 28

Attractive, salt glazed unit, 3⅞x8x4⅞".

EXTERIOR WALLS

Natco Vitritile.....Pages 4 to 26 inc.

A particularly attractive glazed load bearing, structural face tile—sanitary—easily cleaned.

Natco Vitribrik.....Pages 27 and 28

A beautifully salt-glazed structural unit, 3⅞x8x4⅞". Permanent in character, form and finish. Dead air cells provide insulation. Effects outstanding economies in labor, mortar and laying-time.

Natco Double Shell Load Bearing Tile

.....Pages 36 to 39 inc.

Furnished with 12x12" scored face for various thicknesses of walls. Double shell construction—resists cold and dampness—provides effective base for stucco and plaster.

Natco Triple X Load Bearing Tile.....Page 40

Has 12x12" scored face for different wall thicknesses. For structures where stucco exterior is desired. Economical, quickly and easily laid, permanent.

Natco Header Backer Tile.....Page 41

Combined with brick in load bearing and curtain walls. Mechanically bonded, light in weight, substantial and permanent. Meets every brick and mortar joint condition.

Natco Unibacker Tile.....Page 42

Provides effective bond between tile and brick facing. But one unit required for entire wall. Insures rapid, economical construction.

Natco Heath Cubes.....Not illustrated

7¾x7¾x7¾" load bearing units. For use with or without brick facing.

Natco Interlocker Tile.....Page 43

Forms a mechanically bonded wall with or without brick facing.

Natco Storage Bins.....Not illustrated

For the storage of coal, grain, ashes, sand, silage and various other materials, Natco Circular Glazed Hollow Tile Storage Bins, reinforced with steel bands, are recommended for permanence, economy and fire safety. These bins vary in size from 8 ft. in diameter to 30 ft. and can be built 50 ft. in height. Descriptive literature on application.

Natco Face Tile (Tex-Tile)..Pages 29 to 35 inc.

Furnished glazed or unglazed, 5x12" face for 8" walls and 10⅜x12" face for ashlar random bond. Attractive texture face in several beautiful color ranges. Double shell construction. For residences, office and commercial buildings, etc.

Natco Face Tile (Combed Face)

.....Pages 29 to 35 inc.

5x12" combed exterior face—interior smooth, sanitary, easily cleaned, for 8" walls. Double shell construction. For industrial and factory buildings, etc.

Natco Face Tile (Smooth "Tex" Finish)

.....Page 53

Natco Face and Common Brick.....Page 53

FIREPROOFING

Natco Girder and Column Covering

.....Pages 50 to 52 inc.

Well burned Natco Hollow Tile has no equal as a covering for structural steel or iron—is best non-conductor of heat—is not destroyed by fire or water—all necessary shapes and sizes furnished.

FLOORS

(Also adapted to flat roofs)

Natcoflor.....Page 45

Combination of special shaped Natco Tile with 2" wide reinforced cement grout joints. Saves dead load, floor depth, labor costs and insurance—all tile ceiling.

Natco Flat Arch Floors.....Pages 46 to 48 inc.

Afford great strength and fire safety with minimum weight. Can be laid winter and summer because they require no concrete fill or costly forms. All tile ceiling.

Natco Combination Floors—(Standard One and Two Way Systems).....Page 49

Adapted for all classes of buildings where long span fireproof floors are required. Minimizes dead load and provides a good plastering surface.

Natco Segmental Arch.....Page 48

Particularly adaptable for warehouses, lofts, factories, sidewalks or where great strength is required and a flat ceiling is not necessary.

ROOFS

(See also Floors above)

Natco Book Tile.....Page 48

A permanent, non-spalling roof of high insulating value due to the enclosed air spaces. Particularly adapted for mill buildings and similar structures—also for buildings where a light, pitched roof is required.

Natco Shingle and Roofing Tile..Not illustrated

Available in standard patterns in a range of colors in a variety of surface textures. Factory located at Birmingham, Alabama.

ELECTRICAL SERVICE LINES

Natco Clay Conduit.....Page 43

Adapted for outside cables of group building projects, in service tunnels or in walls or under floors of buildings.

NATIONAL FIREPROOFING CORPORATION

Manufacturers of Natco Structural Clay Tile

Fulton Building
PITTSBURGH, PA.

BRANCH OFFICES

BIRMINGHAM, ALA. Martin Building
BOSTON, MASS. Textile Building
CHICAGO, ILL. Builders Building
NEW YORK, N. Y. Chanin Building
PHILADELPHIA, PA. Architects Building
WASHINGTON, D. C. National Press Building

IN CANADA: National Fire Proofing Co. of Canada, Ltd., TORONTO, ONT.

The Corporation

Established in 1889, the NATIONAL FIREPROOFING CORPORATION has been in business continuously since that time. It is the only concern in the world manufacturing a complete line of structural clay products.

Beside the branch sales and service offices listed above, the company also operates as contractors for fireproof construction in hollow building tile in the Chicago district.

TRADE NATCO MARK

Facilities

The total production of the NATIONAL FIREPROOFING CORPORATION approximates a million tons of structural clay products annually. This production comprises structural clay tile to meet every building need.

The Corporation operates twenty-three plants in seventeen different localities, in close proximity to the principal tile markets of the country. In addition, it operates a plant in Hamilton, Ontario. It owns or leases over 5000 acres of clay deposits. It is estimated that the deposits thus controlled contain not less than 56,000,000 recoverable tons of clay, which, at the normal rate of operation, is sufficient to last more than fifty years.

Reliability

The rating of the Corporation in Dun and Bradstreet, together with its long record of fair dealing with its customers is the best possible guarantee of its dependability and stability.

Branding

All structural clay tile manufactured by the NATIONAL FIREPROOFING CORPORATION is branded with the trade mark name "NATCO." Special types bear, in addition, marks of identification, such as Natco XXX, Natco Header Backer, Natco Unibacker, etc. All tile intended for load bearing walls are so branded.

The Product

Natco Structural Clay Tile is made from special clay, found only in certain favored localities. This clay is mined and moulded into scientifically designed shapes that provide maximum strength and durability with a minimum of weight. These shapes are dried, then placed in large kilns where they are exposed to a temperature of over 2000 degrees varied to suit the structural or non-structural use of the ware.

The Complete Natco Line

Natco, The Complete Line of Structural Clay Tile, comprises units to meet every building need in structures of every kind.

You have a single source of supply, backed by one united, uncompromising responsibility. Along with the tremendous production facilities of the Corporation you have the stability, the experience and the practical knowledge of the needs of the field that has come with over forty years in business.

Engineering Service

The Corporation maintains an adequate and efficient Engineering Department. This department is anxious to co-operate and show you how you can most economically and satisfactorily use Natco Structural Clay Tile to the best advantage in every type of construction.

ADVANTAGES OF NATCO STRUCTURAL CLAY TILE

Permanence

Made of selected clay, cured and burned under the careful supervision of graduate ceramic engineers, Natco tile is permanent in form and structure. It is unaffected by heat, cold, dampness and chemicals—never warps or disintegrates.

Strength

Natco Tile is scientifically designed for the purpose to which it is to be applied. The aim is to obtain maximum strength, with minimum weight.

Minimum Weight

Natco Structural Clay Tile, while equal or superior to other materials in strength, insulating qualities, and fire safety, affords through its lightness considerable savings in dead load as well as in steel and foundation costs.

Insulating Qualities

With Natco Structural Clay Tile, the enclosed dead air spaces provide positive insulation against rapid changes in temperature. In wall construction where any of the types of double shell tile are used, the double shell construction itself, with its wide non-continuous mortar joints, together with the moisture stops at each end acts as an additional barrier against the passage of cold, heat and moisture.

Due primarily to its insulating qualities, Natco Structural Clay Tile has no equal as a covering for steel. In floor construction, its insulating qualities give it a distinct advantage over other types of floors.

Fire Safety

Made of raw material—clay—which is absolutely non-inflammable, and then exposed during manufacture to over 2000 degrees of heat, Natco Tile is obviously fire-resistive. Its rate of heat transfer is very low, so that it is the ideal material to shield steel work in skeleton buildings.

Soundproofness

Due to the dead air spaces which resist the passage of sound, walls and floors of Natco Structural Clay Tile are more nearly soundproof than any solid structural materials.

Installations

So many outstanding buildings all over the country have been constructed of Natco Structural Clay Tile, that it is out of the question to give even a partial list. In thousands of public buildings, skyscrapers, hospitals, schools, institutions of all kinds, residences, industrial and commercial buildings, and other types of buildings, Natco Structural Clay Tile has been used and is giving perfect satisfaction.

Distribution

Natco plants are strategically located near the principal tile markets of the country. Wherever possible, orders are placed with those plants most advantageously located in order to make savings in transportation charges.

Shipping

Natco Tile are loaded by experts, under close supervision, assuring that the cars will come through with a minimum of breakage. On material such as Vitritile, cardboard wrappers are used, to assure arrival in first class condition.

Single Source of Supply

Instead of buying wall tile one place, floor tile another, you can—by using Natco—fill all tile needs from a single source of supply. Shipments may be better arranged to suit your needs, car load lots may be made up instead of expensive partial shipments and all responsibility will rest with one company.

FOR PERMANENT WALLS OF LASTING BEAUTY—NATCO VITRITILE

General—Natco Vitritile is a building material of proven merit and established worth. It opens new fields of color composition and color harmony, and at the same time offers a new medium of expression to architects, designers and builders. The comprehensive line of structural units is painted with flame in enduring colors. Full and partial buff shade ranges, with a rich chocolate brown for trim, are furnished in the salt glazed Vitritile. Close ranges of light buffs with mottled surfaces, cream overtones with a delicate green base color, cream overtones with a pleasing buff base color, semi-glazed white, and soft pleasing black, are available in the Fritted Glaze Vitritile.

Beautiful When Installed—the Beauty of Natco Vitritile Endures—Each Natco Vitritile unit laid forms a section of a verminproof, insulated, finished-face wall, on which no further surface treatment is required, then or ever. The glass-hard, glass-smooth glazed surface needs no paint, no plaster, no adornment of any kind. It is permanently free from the need for such maintenance—for the Natco Vitritile glazes last as long as the building.

High-fired Glazes—Natco Vitritile glazes are all high-fired—that is, burned at temperatures of 1800° to 2000°. The fritted glaze process, as applied to Natco Vitritile, is the fruit of intensive research and development. It requires extensive machinery, added labor. The beauty and permanence of the results attained, however, abundantly justify the added effort. The most gruelling laboratory tests, plus service tests of actual installations, show conclusively the resistive and lasting qualities of the Natco Vitritile Glazes.

Universal Appeal—Practically Universal Application—The field of use of Natco Vitritile is practically unlimited. It is ideal for walls, partitions, dwarf walls, and wainscots in laboratories, schools, airports, restaurants, hotel kitchens and supply rooms, hospitals, gymnasiums, natatoriums, corridors, substations, subways and subway stations, public comfort stations, lavatories, shower rooms, garages, abattoirs, basements, filling stations, waiting rooms.

In short, it has an application somewhere in every building, everywhere in some buildings.

For Every Structural Need—Natco Vitritile is manufactured in 3¾", 6" and 8" wall thicknesses, and also in 1⅞" thickness for furring brick, stone, concrete, etc. It is suitable for both interior and exterior load bearing and non-load bearing walls and partitions. A comprehensive line of shapes is provided for corners, closures, sills, lintels, base and cap, giving wide latitude in structural design. Some of the most commonly used shapes are illustrated on succeeding pages. The line of current shapes is illustrated and described on succeeding pages.

Strong Insulated—Natco Vitritile has great strength, making it suitable for load bearing use, as well as for wall facing applications. The cellular construction provides effective insulation.

Sanitary—Easily Cleaned—The glass-hard, glazed surfaces of Natco Vitritile effectively resist damage from dirt, grease, chemicals and heat. Are easily cleaned and kept clean.

Uniform Size and Shape—All tile are selected as to shape, and run exceptionally true to size, resulting in neat horizontal and vertical mortar joints—¼" mortar joints are mostly used and generally recommended.

Permanent in Form and Structure—Natco Vitritile is made of selected fire-clay, cured and burned under the direction of competent ceramic engineers. It is unaffected by heat, cold and dampness, never warps or disintegrates.

Minimum Weight—Natco Vitritile is scientifically designed to offer maximum strength with minimum weight. It often effects considerable savings in dead load, which frequently bring economies in steel and foundation costs.

Fire Safe—Made of a raw material—fire-clay—which is absolutely non-inflammable, and then exposed during manufacture to temperatures ranging up to 2000°, Natco Vitritile is highly fire-resistive.

Speedily and Economically Laid—The 3¾"x5"x12" Natco Vitritile unit is equivalent to approximately three brick in displacement. The 6"x5"x12" to four and one-half brick; the 8"x5"x12" to six brick. Each of these units may be quickly and easily handled and laid. As a result, there is a consequent substantial saving in time, labor and mortar.

Carefully Packed and Shipped—Each Natco Vitritile unit of the select and standard grade is placed in a corrugated paper container, and then is carefully loaded and braced in cars, thus assuring safe arrival at destination. "Second" quality Vitritile are carefully packed in straw and lath.

CLASSIFICATIONS AND COLORS

Select Grades—This includes that quality of tile which is free from chips or other imperfections that would affect the attractiveness of the finished wall. It is available in the following different finishes:

Shade Range No. 1000—Fritted Glaze—A close range of light buff shades with mottled surface.

Shade Range No. 8530-S—Fritted Glaze—A cream mottled effect with a slight mingling of green.

Shade Range No. 8535-L—Fritted Glaze—A blending of buff and cream, with mottled surface.

Shade Range No. 2040—Fritted Glaze—A range shading from buff to golden tan.

Shade Range No. 1500—Fritted Glaze—A matt finish white.

Shade Range No. 6610—Fritted Glaze—A soft, pleasing dull black.

Shade Range No. 50—Salt Glazed—A buff shade range with a slight mingling of the lighter shades.

Shade Range No. 200—Salt Glazed—A full-mingled buff shade range. Colors from the lighter to the darker are included.

Shade Range No. 90—Glazed—A chocolate color that is standard for cove base shapes only. No other shapes will be regularly carried in stock in this shade. When the No. 90 Shade Range is desired for special purposes in shapes other than cove base, communicate with this office.

Note: Natco Vitritile is not furnished in uniform matched colors, as much more attractive and artistic effects are secured by the mingling of the shades as shipped.

Commercial Grade—Furnished only in a full range (run of kiln) of shades. Commercial quality includes those tile which, due to slight facial imperfections, cannot be classed as select. No tile not structurally sound are included. The appearance of the finished walls erected of this quality is quite pleasing, and this grade will be found suitable for many types of buildings.

Second Grade—Prices will be quoted on seconds, upon request. Under this classification is included tile with small chips or other imperfections which do not seriously impair the structural value of the tile. Used where appearance is not a prime factor.

Faces—All sizes of Natco Vitritile are furnished select one face, while the 3¾" thickness is also furnished select two faces for two face partitions when so desired. The 3¾", 6" and 8" tile are available scored on one side for the application of plaster.

Color Reproductions—The color reproductions of Vitritile used here and in Natco literature are printed from process plates, made direct from tile panels, which give the most authentic reproductions possible. It should be borne in mind, however, that printer's ink on paper cannot possibly match exactly a vitrified product; and that the reduction in size of the illustrated units also affects the appearance. The color plates are, therefore, intended merely to give a close approximation of the tile as furnished, and cannot be considered as absolute duplicates.

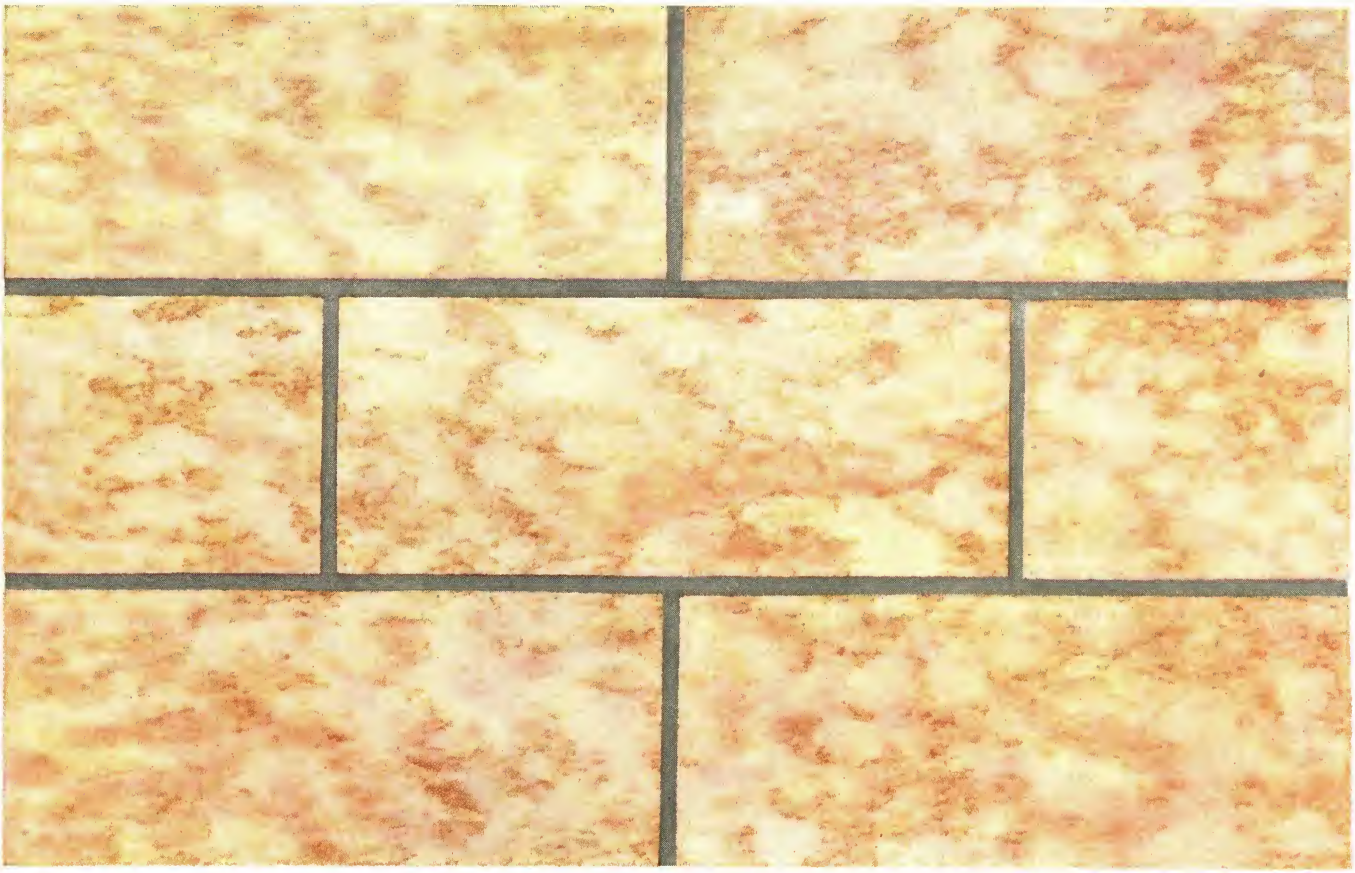
SHADE RANGE NO. 1000—FRITTED GLAZE

A close range of light buff shades with mottled surface

SHADE RANGE NO. 8530-S—FRITTED GLAZE

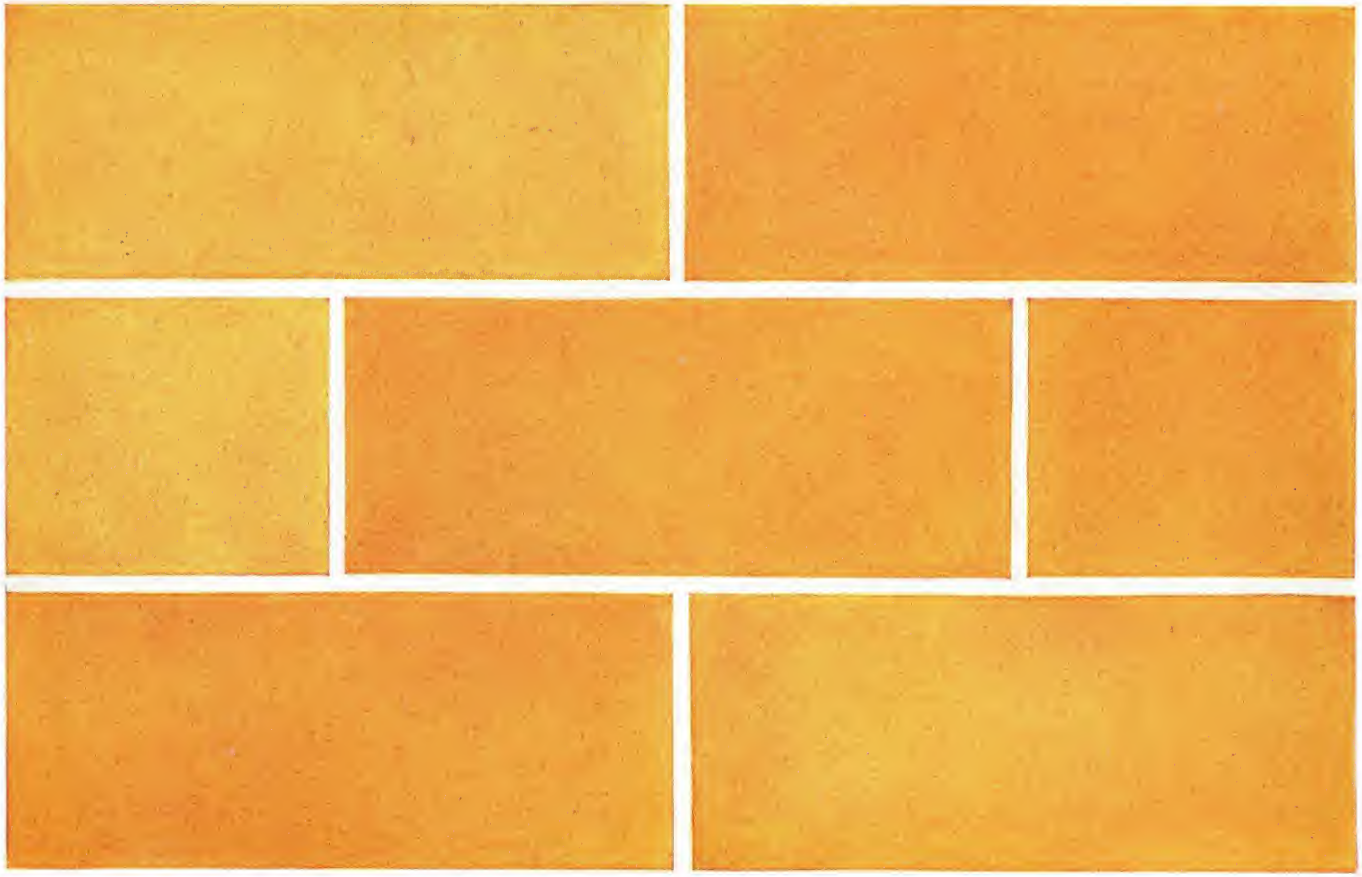
A pleasing mottled effect with a slight mingling of green

SEE NOTE ON "COLOR REPRODUCTIONS" NATCO PAGE 4.



SHADE RANGE NO. 8535-L—FRITTED GLAZE

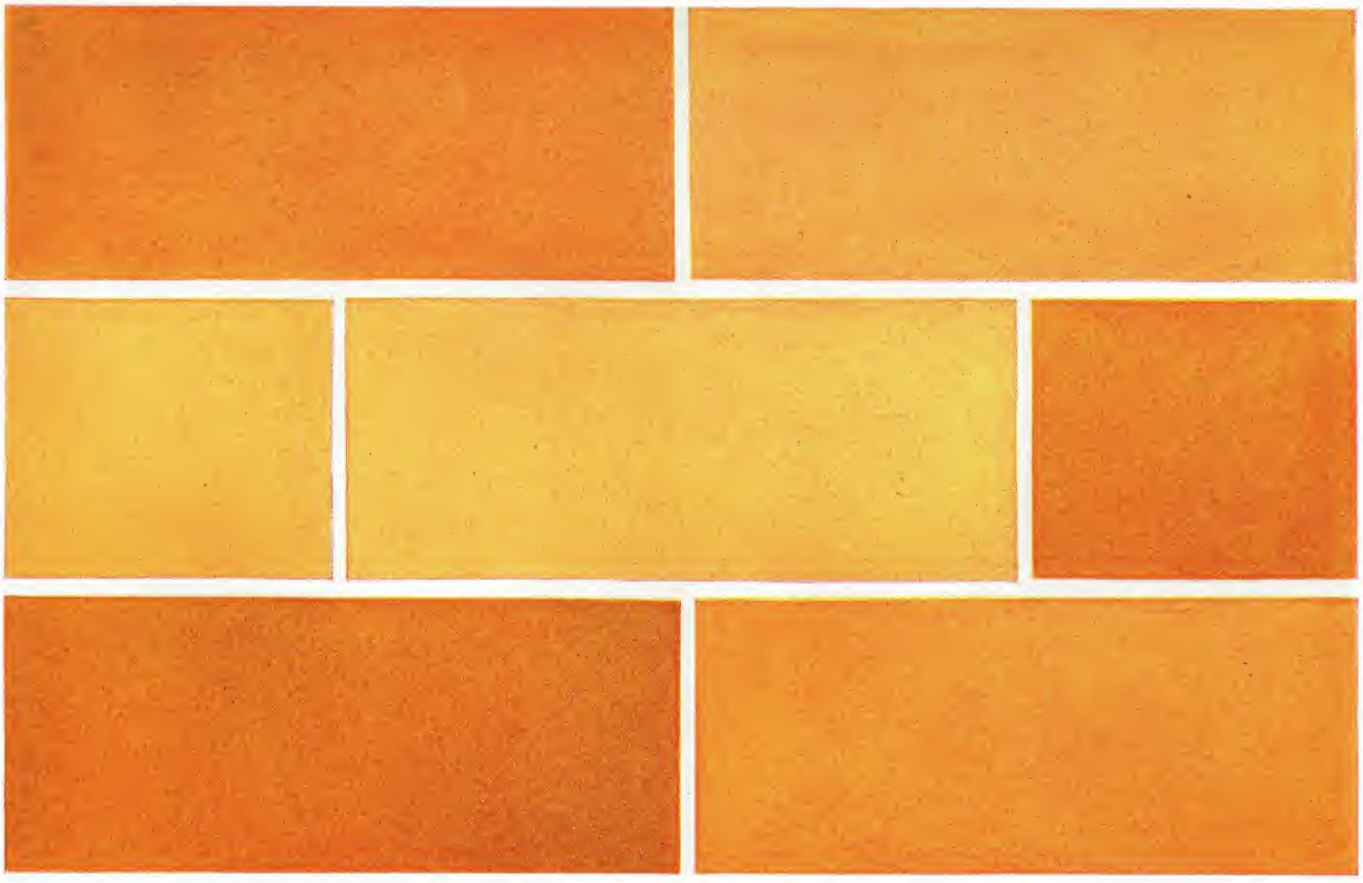
A blending of brown and cream, with mottled surfaces



SHADE RANGE NO. 50—SALT GLAZED

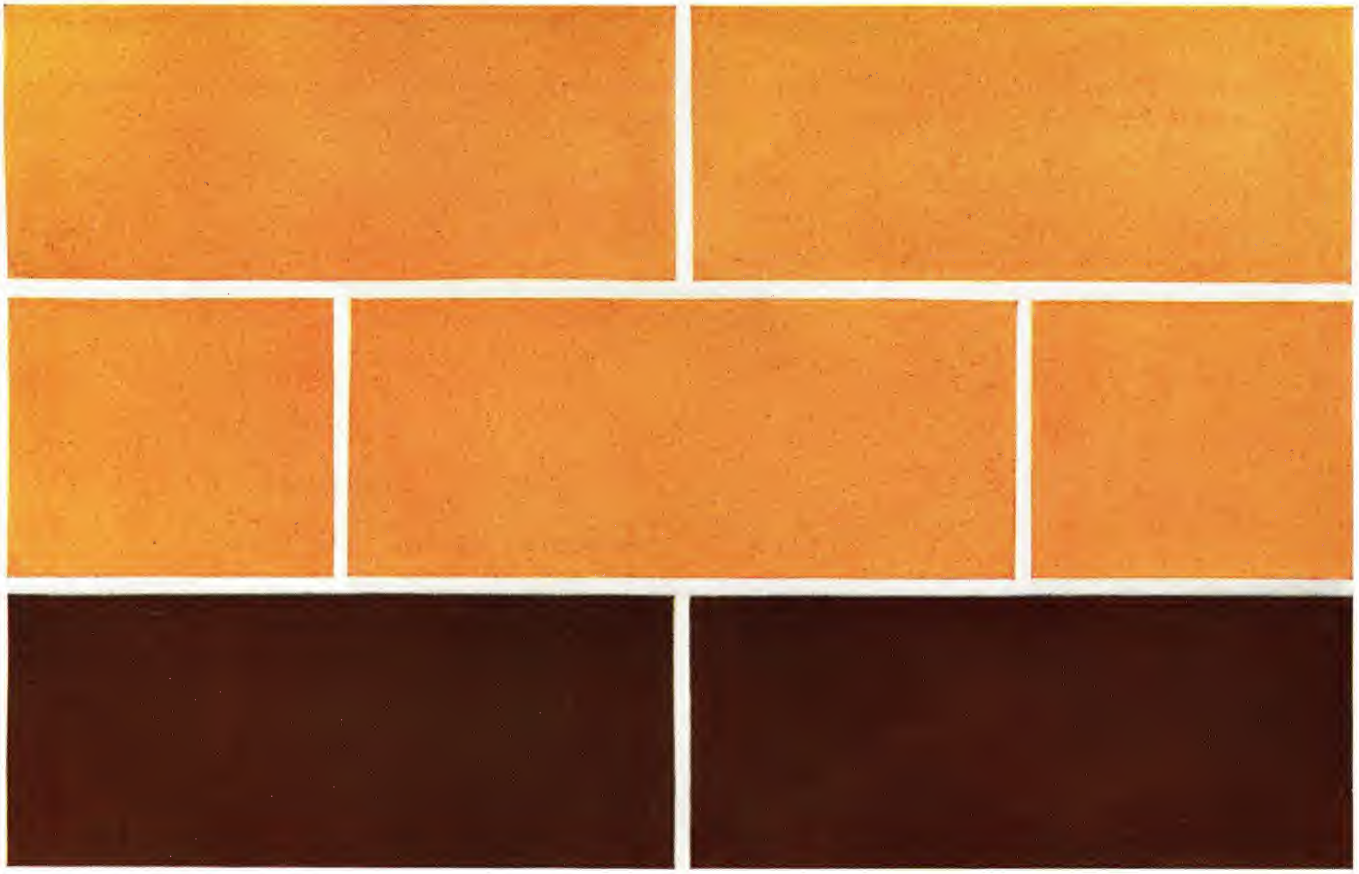
A buff shade range with a slight mingling of the lighter shades

SEE NOTE ON "COLOR REPRODUCTIONS" NATCO PAGE 4.



SHADE RANGE NO. 200—SALT GLAZED

A full mingled buff shade range; colors from lighter to darker are included



SHADE RANGE NO. 90—SALT GLAZED (Shown as trim or base) in conjunction with Shade Range 50. Chocolate color; standard for cove base only. Furnished for other shapes on special order

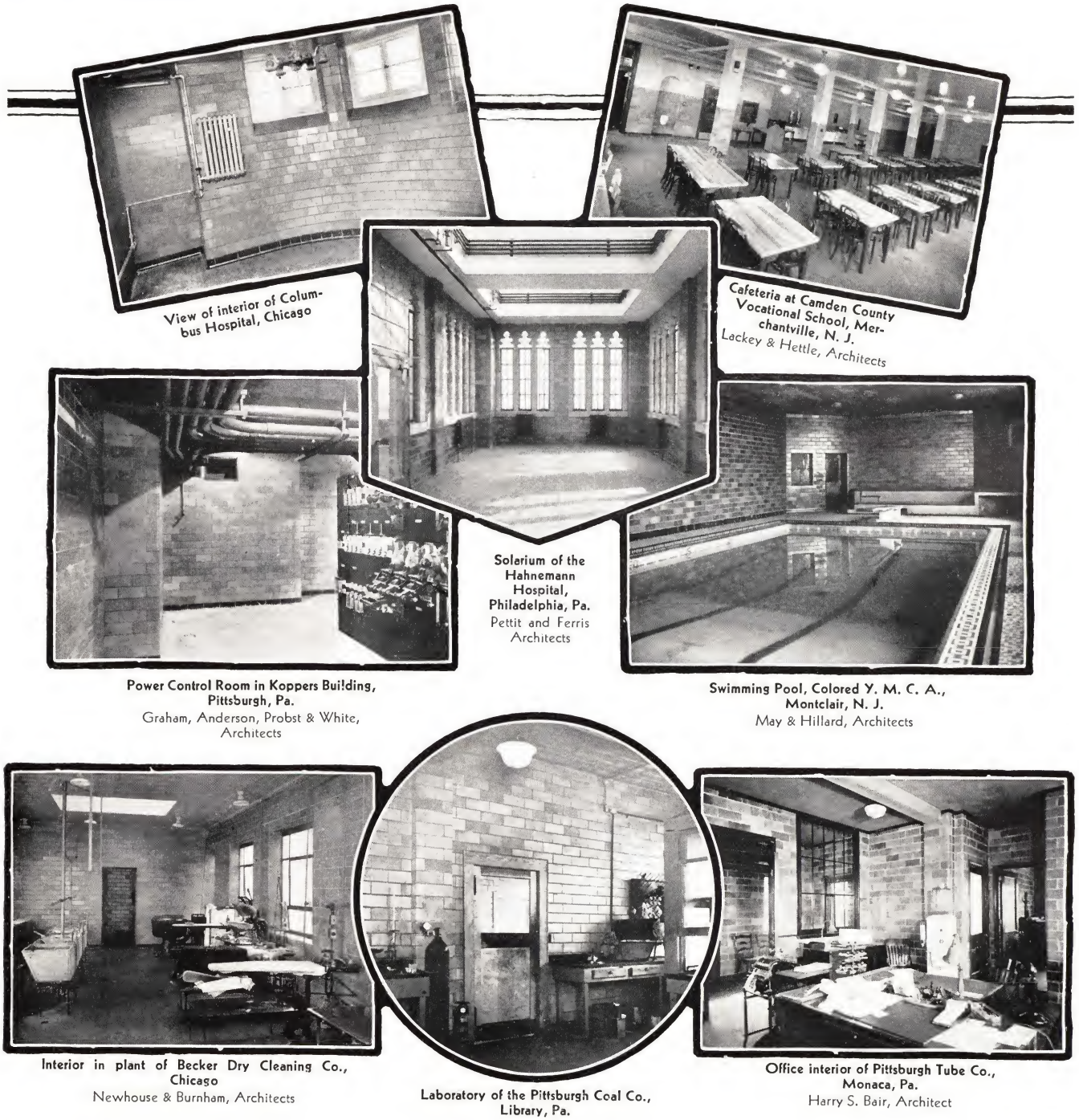
SEE NOTE ON "COLOR REPRODUCTIONS" NATCO PAGE 4

SHADE RANGE NO. 2040—FRITTED GLAZE	NOT ILLUSTRATED	A range of golden tan to buff
SHADE RANGE NO. 1500—FRITTED GLAZE	NOT ILLUSTRATED	A matt finish white
SHADE RANGE NO. 6610—FRITTED GLAZE	NOT ILLUSTRATED	A soft, pleasing dull black

NOTE

Natco Vitritile is not furnished in uniform matched colors, as much more attractive and artistic effects are secured by the mingling of the shades as shipped.

NATCO VITRITILE COLOR PANELS



View of interior of Columbus Hospital, Chicago

Cafeteria at Camden County Vocational School, Merchantville, N. J.
Lackey & Hettle, Architects

Solarium of the Hahnemann Hospital, Philadelphia, Pa.
Pettit and Ferris Architects

Power Control Room in Koppers Building, Pittsburgh, Pa.
Graham, Anderson, Probst & White, Architects

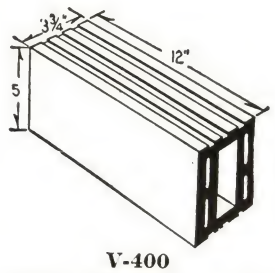
Swimming Pool, Colored Y. M. C. A., Montclair, N. J.
May & Hillard, Architects

Interior in plant of Becker Dry Cleaning Co., Chicago
Newhouse & Burnham, Architects

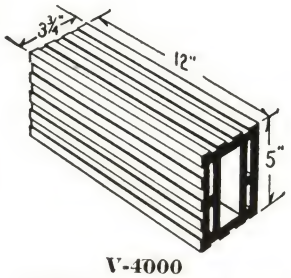
Laboratory of the Pittsburgh Coal Co., Library, Pa.

Office interior of Pittsburgh Tube Co., Monaca, Pa.
Harry S. Bair, Architect

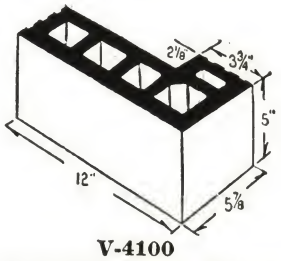
A FEW TYPICAL NATCO VITRITILE INSTALLATIONS



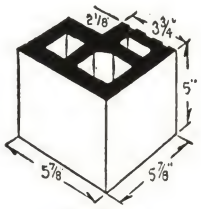
V-400
3¾"x5"x12" Wall Stretcher (smooth two sides), also furnished in 2", 3", 4", 5⅞", 8" and 10" lengths



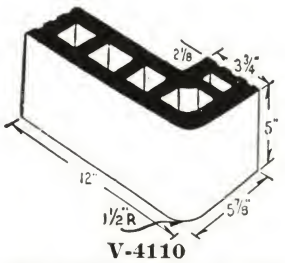
V-4000
3¾"x5"x12" Wall Stretcher (smooth one side, scored one side), also furnished in 2", 3" 4", 5⅞", 8" and 10" lengths



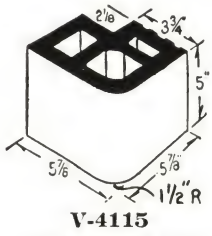
V-4100
3¾"x12"x5" Square External and Internal Corner



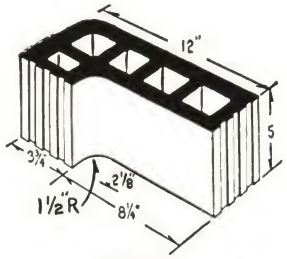
V-4105
3¾"x5⅞x5" Square External and Internal Half Corner



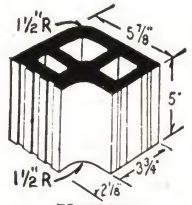
V-4110
3¾"x12"x5" Bullnose External and Square Internal Corner



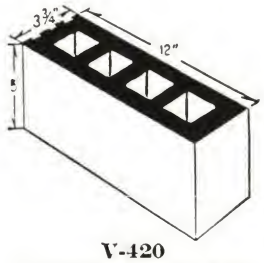
V-4115
3¾"x5⅞"x5" Bullnose External and Square Internal Half Corner



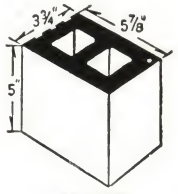
V-4120
3¾"x12"x5" Bullnose External and Coved Internal Corner



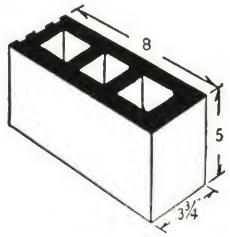
V-4125
3¾"x5⅞"x5" Bullnose External and Coved Internal Half Corner



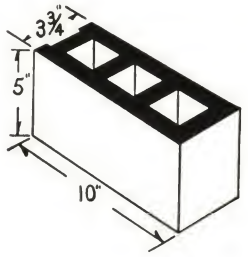
V-420
3¾"x12"x5" Square Full Closure



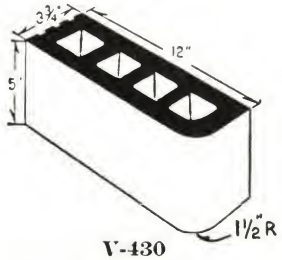
V-426
3¾"x5⅞"x5" Square Half Closure



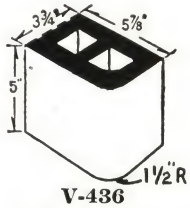
V-4280
3¾"x8"x5" Square Pilaster



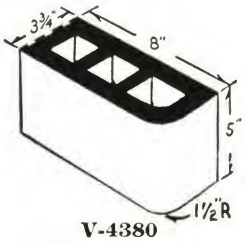
V-420-10
3¾"x10"x5" Single Square Special Closure



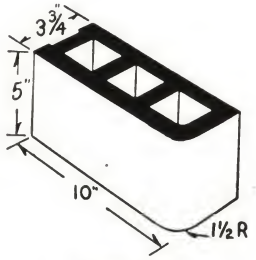
V-430
3¾"x12"x5" Single Bullnose Full Closure



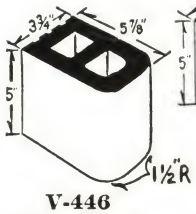
V-436
3¾"x5⅞"x5 Single, Bullnose Half Closure



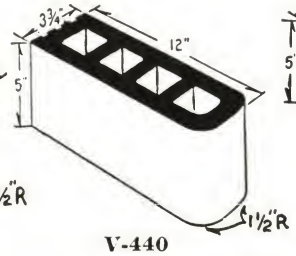
V-4380
3¾"x8"x5" Single Bullnose Pilaster



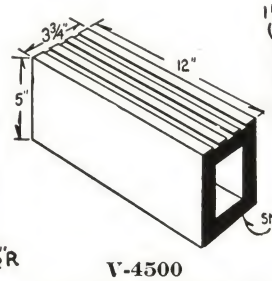
V-430-10
3¾"x10"x5" Single Bullnose Special Closure



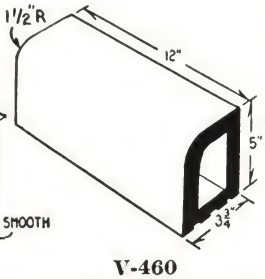
V-446
3¾"x5⅞"x5" Double Bullnose Half Closure



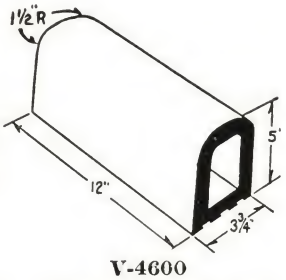
V-440
3¾"x12"x5" Double Bullnose Full Closure



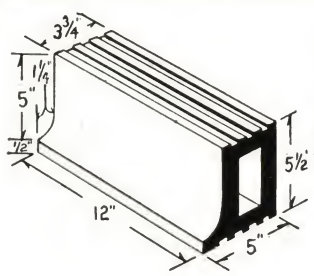
V-4500
3¾"x 5"x 12" Square Sill or Lintel Tile. Also furnished in 5⅞" and 8" lengths.



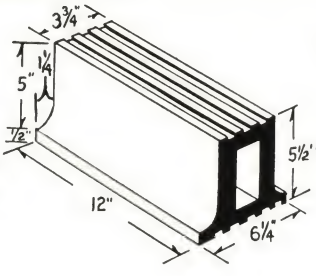
V-460
3¾"x5"x12" Single Bullnose Sill or Lintel Tile. Also furnished in 5⅞" and 8" lengths.



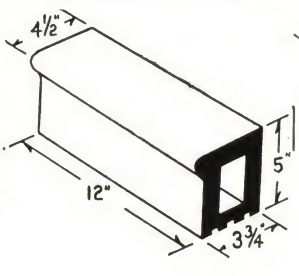
V-4600
3¾"x5"x12" Double Bullnose Coping Tile. Also furnished in 5⅞" and 8" lengths.



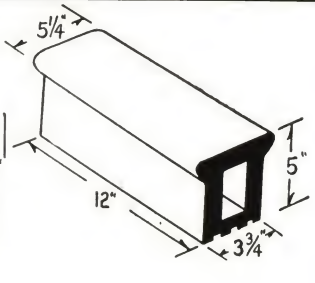
V-470
3¾"x5½"x12" Single Cove Base. Furnished in 2", 3", 4", 5⅞", 8" and 10" lengths



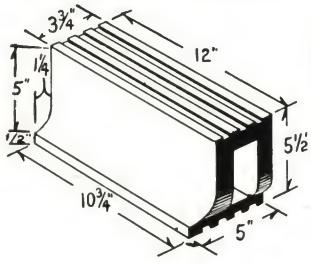
V-4700
3¾"x5½"x12" Double Cove Base. Furnished in 2", 3", 4", 5⅞", 8" and 10" lengths



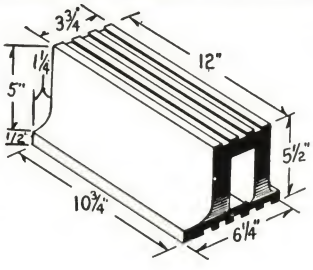
V-480
3¾"x5"x12" Single Wainscot Cap. Furnished in 2", 3", 4", 5⅞", 8" and 10" lengths



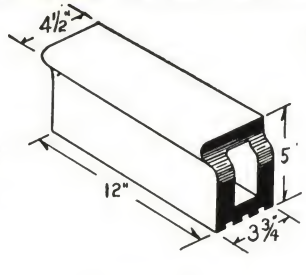
V-4800
3¾"x5"x12" Double Wainscot Cap. Furnished in 2", 3" 4", 5⅞", 8" and 10" lengths



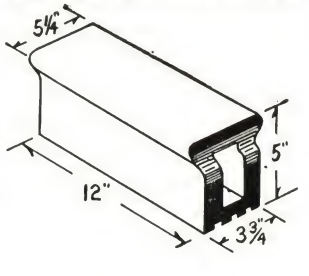
V-K470-R
3¾"x5½"x12" Single Cove Base, coped right (coped left opposite hand). Furnished in 3", 4", 5⅞" and 8" lengths



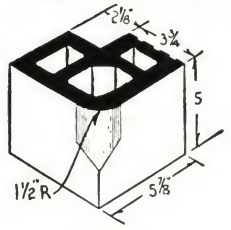
V-K4700
3¾"x5½"x12" Double Cove Base, coped Furnished in 3", 4", 5⅞" and 8" lengths



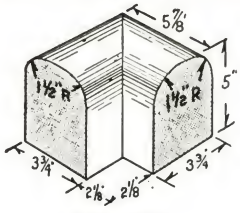
V-K480-R
3¾"x5"x12" Single Wainscot Cap, coped right (coped left opposite hand). Furnished in 3", 4", 5⅞" and 8" lengths



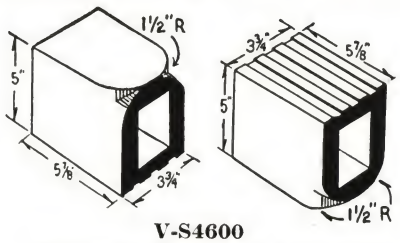
V-K4800
3¾"x5"x12" Double Wainscot Cap, coped. Furnished in 3", 4", 5⅞" and 8" lengths



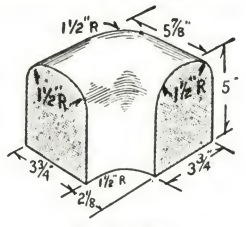
V-C4075
3¾"x5⅞"x5" Chamfered Corner



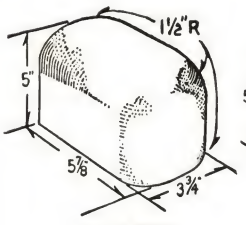
V-C4600
3¾"x5⅞"x5" Double Bullnose Coping Square External and Internal Corner



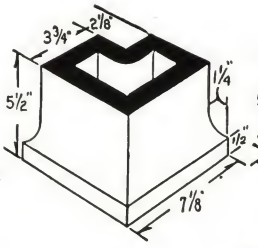
V-S4600
3¾"x5"x5⅞" Combination Bullnose Sill or Lintel Starter, for use with Bullnose Sills, Lintels and Jambs

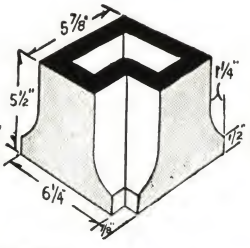


V-C4620
3¾"x5⅞"x5" Double Bullnose Coping Bullnose External and Coved Internal Corner

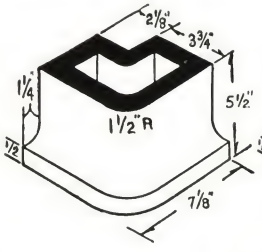


V-C4660
3¾"x5"x5⅞" Double Bullnose Coping Closure. Used with V-4600

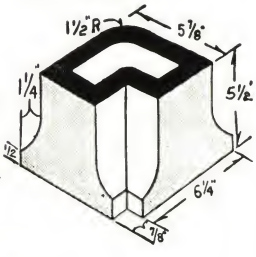


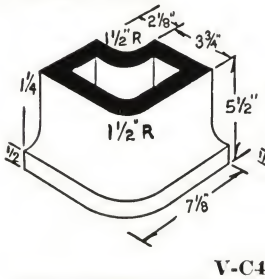


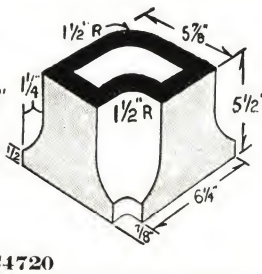
V-C4700
3¾"x5⅞"x5½" Square External and Internal Cove Base Corners



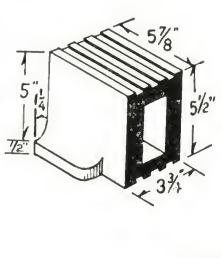
V-C4710
3¾"x5⅞"x5½" Bullnose External and Square Internal Cove Base Corner



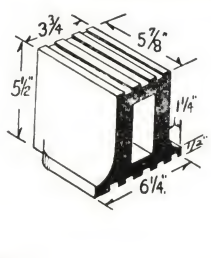


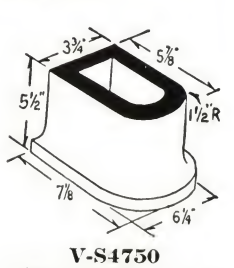


V-C4720
3¾"x5⅞"x5½" Bullnose External and Coved Internal Cove Base Corner

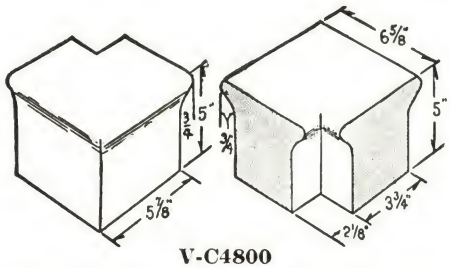


V-S4700
3¾"x5½"x5⅞" Double Cove Base Stop



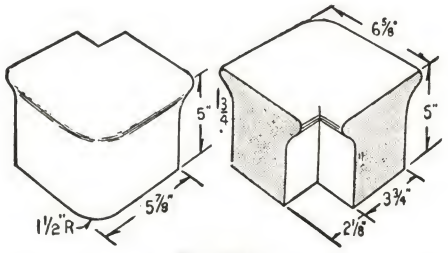


V-S4750
3¾"x5⅞"x5½" Cove Base Double Bullnose Closure



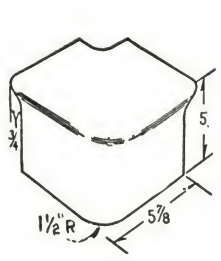
V-C4800

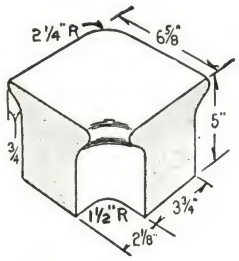
3¾"x5⅞"x5" Square External and Internal Wainscot Cap Corner



V-C4810

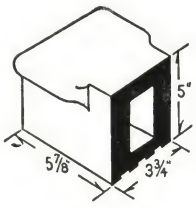
3¾"x 5⅞"x 5" Bullnose External and Square Internal Wainscot Cap Corner

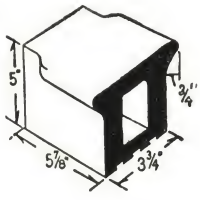




V-C4820

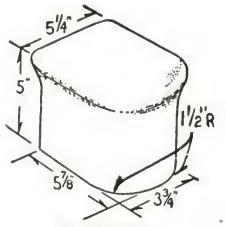
3¾"x5⅞"x5" Bullnose External and Coved Internal Wainscot Cap Corner 1½" radius of Internal Cove and Bullnose





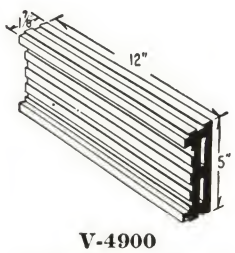
V-S4800

3¾"x5"x5⅞" Double Wainscot Cap Stop



V-S4850

3¾"x5⅞"x5" Wainscot Cap Double Bullnose Closure



V-4900

1⅞"x5"x12" Furring Stretcher. Also furnished in 2", 3", 4", 5⅞", 8" and 10" lengths

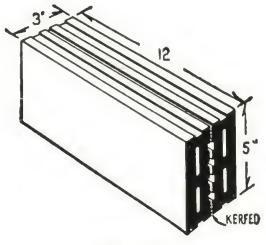
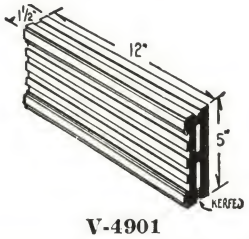


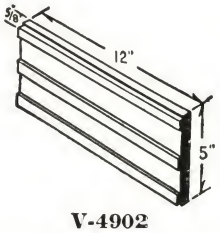
Fig. A

Refer to V-4901 and V-4902 at right



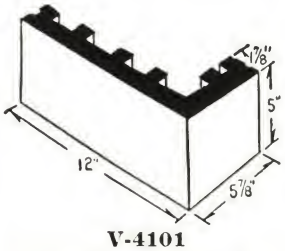
V-4901

1½"x5"x12" Slab. Shipped in pairs in single block, which is kerfed to split. (See Fig. A at left.) This slab furnished for use at pipe chases and conduit spaces. Furnished in 6" and 12" lengths only



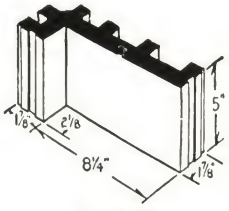
V-4902

⅝"x5"x12" Slab. Shipped in pairs in single block, which is kerfed to split. (See Fig. A and V-4901 at left.) This slab furnished for use at electric conduits and outlets. Furnished in 12" lengths only



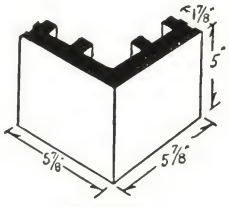
V-4101

1⅞"x12"x5" Furring, Square External Corner



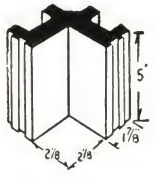
V-4102

1⅞"x8¼"x5" Furring, Square Internal Corner



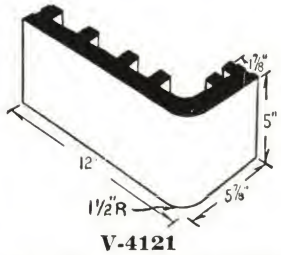
V-4106

1⅞"x5⅞"x5" Furring, Square Half Corner. (External)



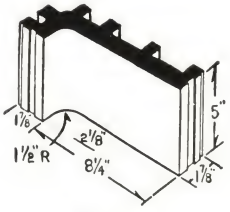
V-4107

1⅞"x2⅛"x5" Furring, Square Half Corner. (Internal)



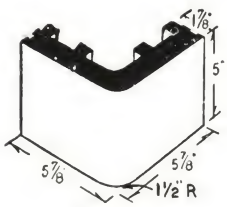
V-4121

1⅞"x12"x5" Furring, Bullnose External Corner



V-4122

1⅞"x8¼"x5" Furring, Coved Internal Corner

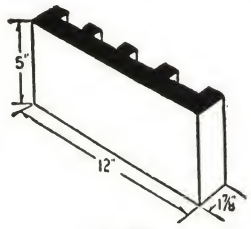


V-4126

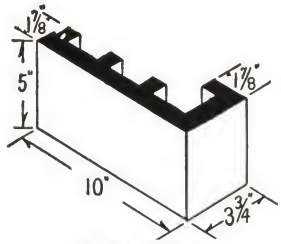
1⅞"x5⅞"x5" Furring, Bullnose Half Corner. (External)

V-4127

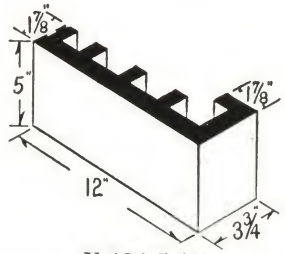
1⅞"x2⅛"x5" Furring, Coved Half Corner. (Internal)



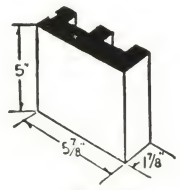
V-421
1⅞"x12"x5" Furring, Square Full Closure



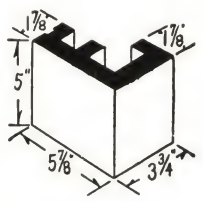
V-424-S-10
1⅞"x10"x5" Furring, Square Special Closure



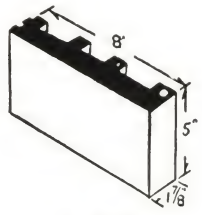
V-424-S-12
1⅞"x12"x5" Furring, Square Special Full Closure



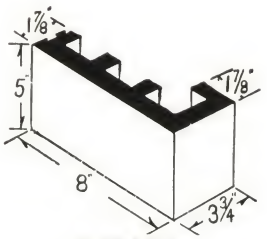
V-427
1⅞"x5⅞"x5" Furring, Square Half Closure



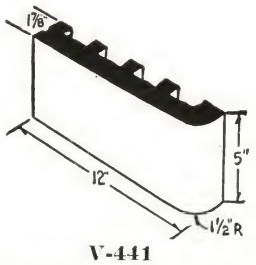
V-424-S-6
1⅞"x5⅞"x5" Furring, Square Special Half Closure



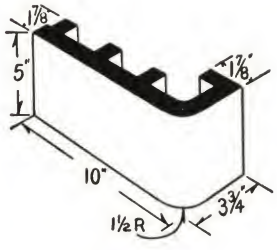
V-4282
1⅞"x8"x5" Furring, Square Pilaster



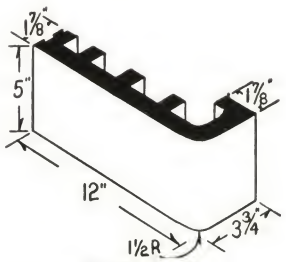
V-424-S-8
1⅞"x8"x5" Furring, Square Special Closure



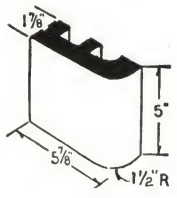
V-441
1⅞"x12"x5" Furring, Bullnose Full Closure



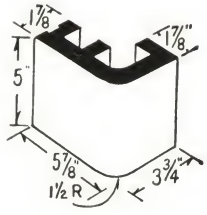
V-434-S-10
1⅞"x10"x5" Furring, Bullnose Special Closure



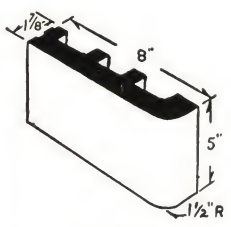
V-434-S-12
1⅞"x12"x5" Furring, Bullnose Special Full Closure



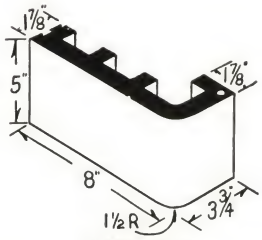
V-447
1⅞"x5⅞"x5" Furring, Bullnose Half Closure.



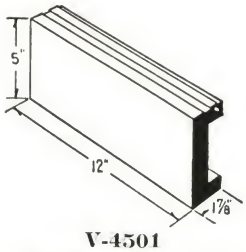
V-434-S-6
1⅞"x5⅜"x5" Furring, Bullnose Special Half Closure



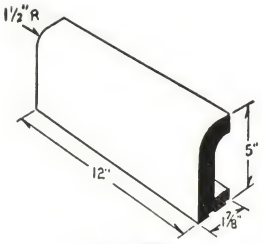
V-4382
1⅞"x8"x5" Furring, Bullnose Pilaster



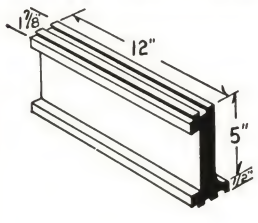
V-434-S-8
1⅞"x8"x5" Furring, Bullnose Special Closure



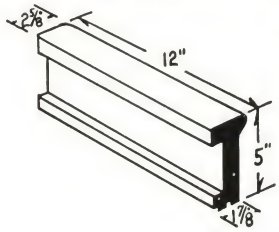
V-4501
1⅞"x5"x12" Furring, Square Sill or Lintel Tile. Also furnished in 5⅞" and 8" lengths. (Note: one face and one edge finished)



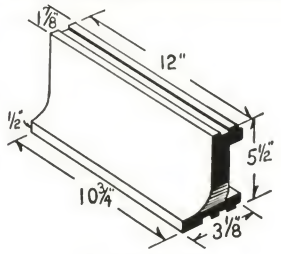
V-4601
1⅞"x5"x12" Furring, Bullnose Sill or Lintel. Also furnished in 5⅞" and 8" lengths



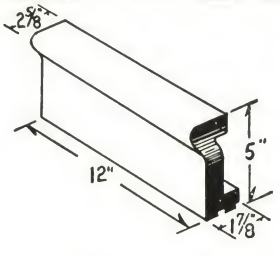
V-4701
1⅞"x5½"x12" Furring, Cove Base. Furnished in 2", 3", 4", 5⅞", 8" and 10" lengths



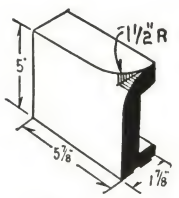
V-4801
1⅞"x5"x12" Furring Wainscot Cap. Furnished in 2", 3", 4", 5⅞", 8" and 10" lengths



V-K4701-R
1⅞"x5½"x12" Furring, Cove Base, coped right (coped left opposite hand.) Furnished in 3", 4", 5⅞" and 8" lengths

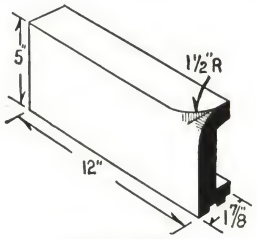


V-K4801-R
1⅞"x5"x12" Furring Wainscot Cap, coped right. (Coped left opposite hand.) Furnished in 3", 4", 5⅞" and 8" lengths



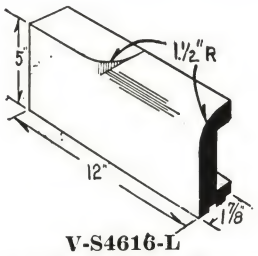
V-S4601-L

1⅞"x5"x5⅞" Furring, Bullnose Sill or Lintel Starter, left hand. (Right hand opposite)



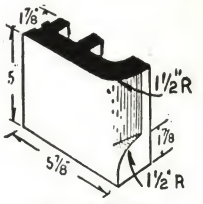
V-S4611-L

1⅞"x5"x12" Furring, Bullnose Sill or Lintel Starter, end type, left hand. (Right hand opposite)



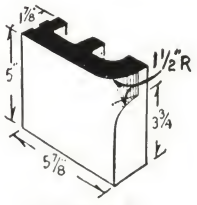
V-S4616-L

1⅞"x5"x12" Furring, Bullnose Sill or Lintel Starter, center type, left hand. (Right hand opposite)



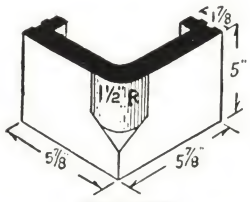
V-S4612-L

1⅞"x5⅞"x5" Furring, Bullnose Sill Starter (for 1⅞" Sill) left hand. (Right hand opposite)



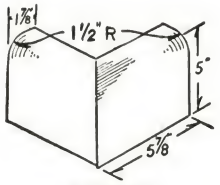
V-S4614-L

1⅞"x5⅞"x5" Furring, Bullnose Sill Starter (for 3¾" Sill) left hand. (Right hand opposite)



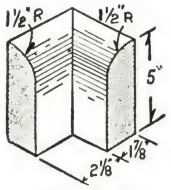
V-C4076

1⅞"x5⅞"x5" Furring, Chamfered Corner. (External)



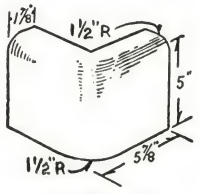
V-C4601

1⅞"x5⅞"x5" Furring, Bullnose Coping, Square External Corner



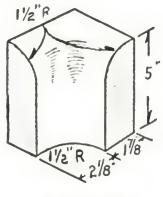
V-C4602

1⅞"x2⅛"x5" Furring, Bullnose Coping, Square Internal Corner.



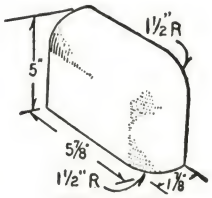
V-C4621

1⅞"x5⅞"x5" Furring, Bullnose Coping, Bullnose External Corner



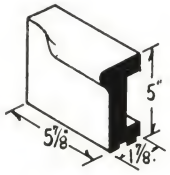
V-C4622

1⅞"x2⅛"x5" Furring, Bullnose Coping, Coved Internal Corner



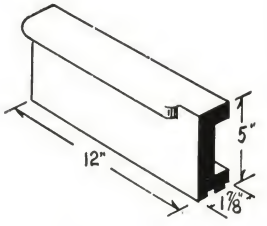
V-C4661-L

1⅞"x5"x5⅞" Furring, Bullnose Coping Closure, left hand. (Right hand opposite)



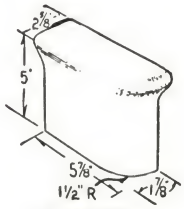
V-S4801-R

1⅞"x5"x5⅞" Furring, Wainscot Cap Stop, square open end, right hand. (Left hand opposite)



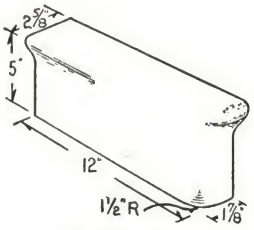
V-S4811-L

1⅞"x5"x12" Furring, Wainscot Cap Stop, square open end, left hand. (Right hand opposite)



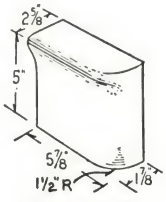
V-S4851-L

1⅞"x5⅞"x5" Furring, Wainscot Cap, Bullnose Closure, left hand. (Right hand opposite)



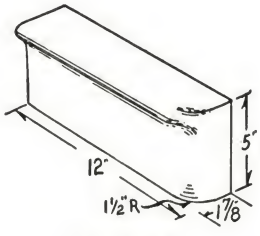
V-S4852-L

1⅞"x12"x5" Furring, Wainscot Cap, Bullnose Closure. (Right hand opposite.)



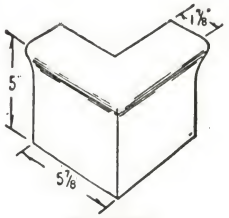
V-S4861-L

1⅞"x5⅞"x5" Furring, Wainscot Cap, Bullnose Stop, left hand. (Right hand opposite)



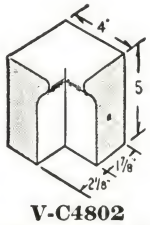
V-S4812-L

1⅞"x12"x5" Furring, Wainscot Cap, Bullnose Stop, left hand. (Right Hand Opposite).



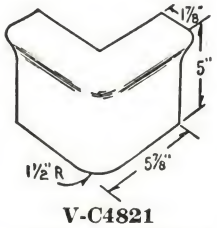
V-C4801

1⅞"x5⅞"x5" Furring, Wainscot Cap Square External Corner



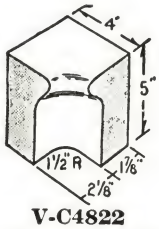
V-C4802

1⅞"x2⅛"x5" Furring, Wainscot Cap Square Internal Corner



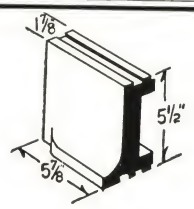
V-C4821

1⅞"x5⅞"x5" Furring, Wainscot Cap Bullnose External Corner



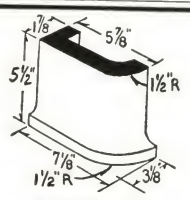
V-C4822

1⅞"x2⅛"x5" Furring, Wainscot Cap Coved Internal Corner. 1½" radius of Internal Cove



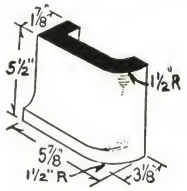
V-S4701-R

1⅞"x5½"x5⅞" Furring, Cove Base Stop, square open end, right hand. (Left hand opposite)



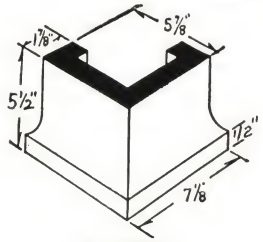
V-S4751-L

1⅞"x5⅞"x5½" Furring, Cove Base Bullnose Closure, left hand. (Right hand opposite)



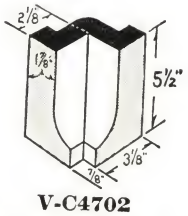
V-S4761-L

1⅞"x5⅞"x5½" Furring, Cove Base Stop, Bullnose, left hand. (Right hand opposite)



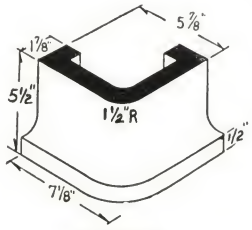
V-C4701

1⅞"x5⅞"x5½" Furring, Cove Base Square External Corner



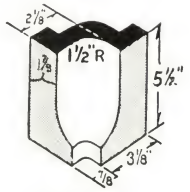
V-C4702

1⅞"x2⅛"x5½" Furring, Cove Base Square Internal Corner



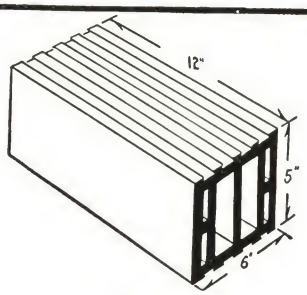
V-C4721

1⅞"x5⅞"x5½" Furring, Cove Base Bullnose External Corner



V-C4722

1⅞"x2⅛"x5½" Furring, Cove Base Coved Internal Corner. 1½" radius of Internal Cove

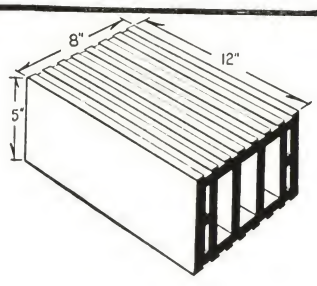


V-600

6"x5"x12" Wall Stretcher (smooth two sides)

V-6000

6"x5"x12" Wall Stretcher (smooth one side, scored one side). Both shapes furnished in 2", 3", 4", 5⅞", 8" and 10" lengths

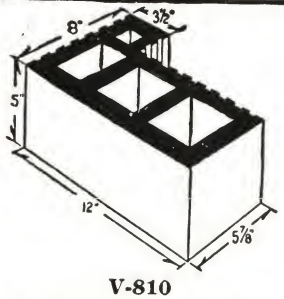


V-800

8"x5"x12" Wall Stretcher (smooth two sides)

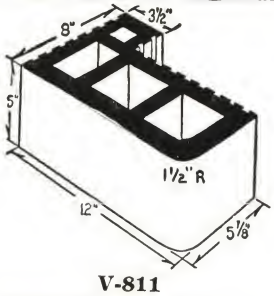
V-8000

8"x5"x12" Wall Stretcher (smooth one side, scored one side). Both shapes furnished in 3", 4", 5⅞", and 8" lengths



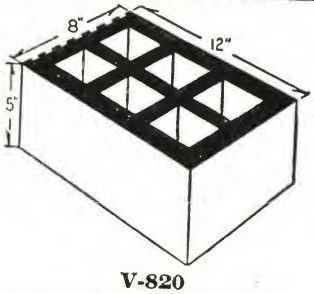
V-810

8"x12"x5" Square Corner



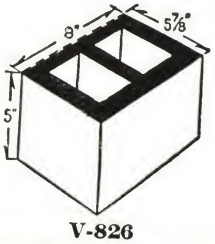
V-811

8"x12"x5" Bullnose Corner



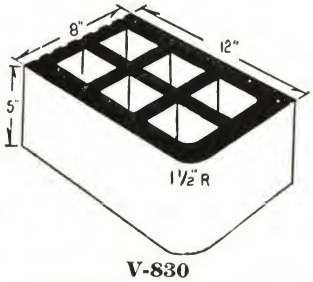
V-820

8"x12"x5" Square Full Closure



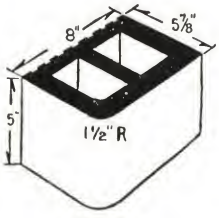
V-826

8"x5⅞"x5" Square Half Closure



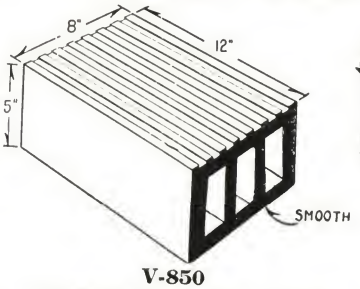
V-830

8"x12"x5" Bullnose Full Closure



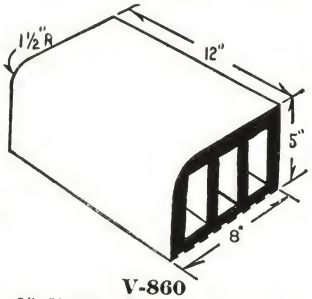
V-836

8"x5⅞"x5" Bullnose Half Closure



V-850

8"x5"x12" Square Sill or Lintel. Also furnished in 5⅞" and 8" lengths



V-860

8"x5"x12" Bullnose Sill or Lintel. Also furnished in 5⅞" and 8" lengths

Fig. 1

Two faced 3¾" Vitritile wall (V-400) showing use of double cove base

Fig. 2

Two faced 3¾" Vitritile wall showing use of double cove base. Double wainscot cap used as chair rail

Fig. 3

Two faced 3¾" Vitritile wall showing double cove base. Double wainscot cap used near ceiling

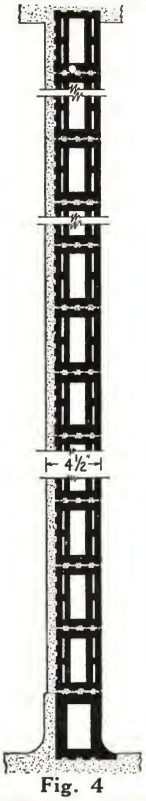


Fig. 4

3¾" Vitritile wall (V-4000) plastered one side, showing single Vitritile cove base and terrazzo base opposite

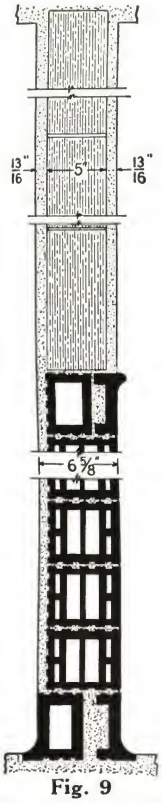


Fig. 9

6" Vitritile wall (V-6000) illustrating wide adaptability of Vitritile to secure any desired effect

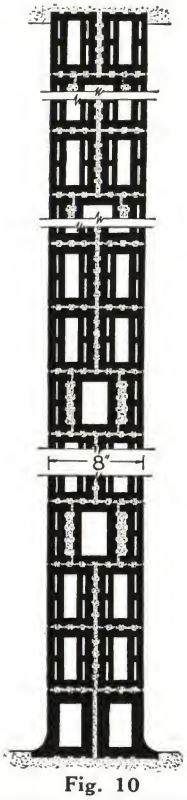


Fig. 10

8" Vitritile wall (V-4000 and V-4900 bonded)

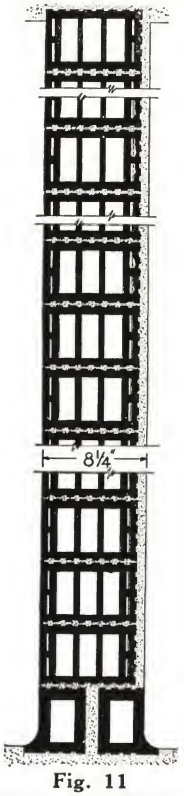


Fig. 11

8" Vitritile wall (V-8000) plastered one side

DETAILS OF DIFFERENT WIDTHS OF WALL SECTIONS

SCALE ¾" = 1'-0"

Fig. 5

4½″ Vitritile two faced wall, illustrating the adaptability of Vitritile where plaster above begins at different elevations on opposite sides

Fig. 6

4½″ Vitritile two faced wall (V-4900) wainscot effect. Wainscot cap used as chair rail

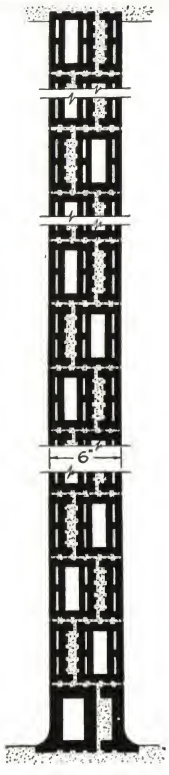


Fig. 7

6″ Vitritile wall (V-4000 and V-4900 bonded)

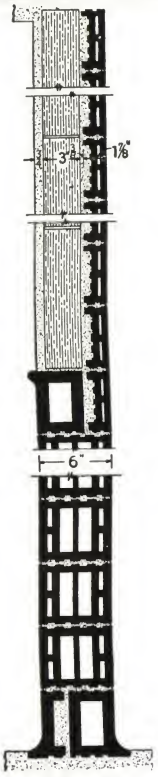


Fig. 8

6″ Vitritile wall (V-600) with plaster one side above chair rail

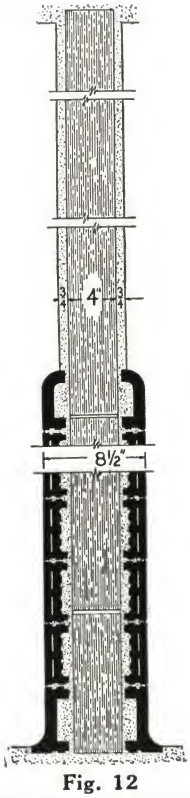


Fig. 12

1⅞″ Vitritile furring used as wainscoting

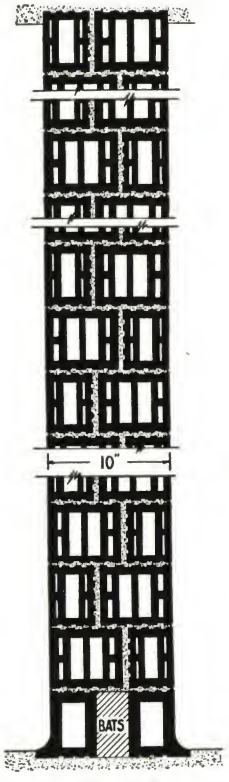


Fig. 13

10″ Vitritile wall (V-600 or 6000 and V-4000 bonded)

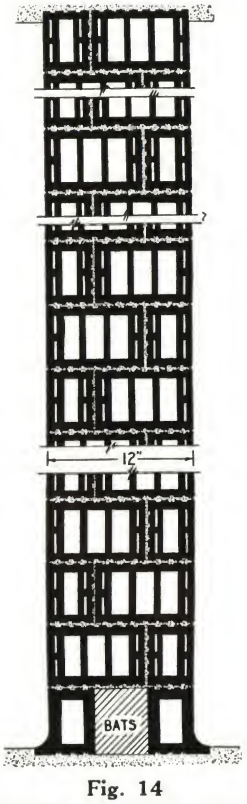


Fig. 14

12″ Vitritile wall (V-800 or 8000 and V-4000 bonded)

DETAILS OF DIFFERENT WIDTHS OF WALL SECTIONS

SCALE ¾″ = 1′-0″

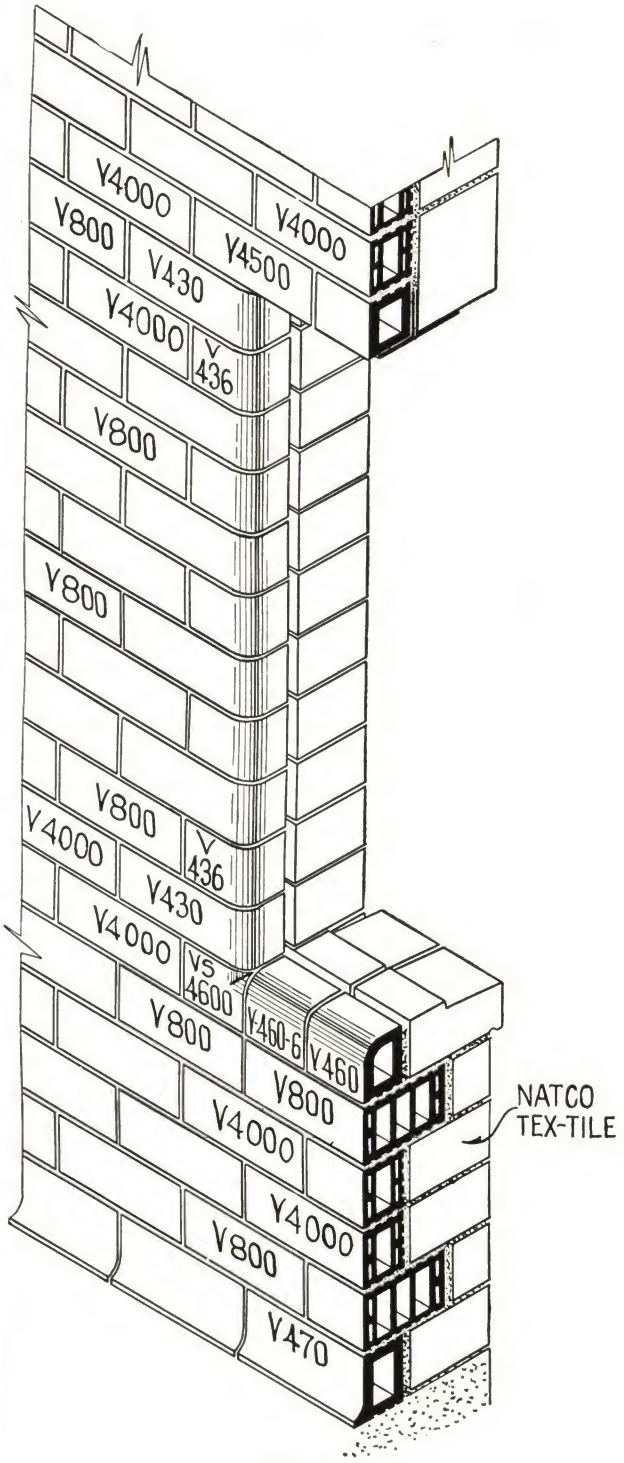


Fig. 15

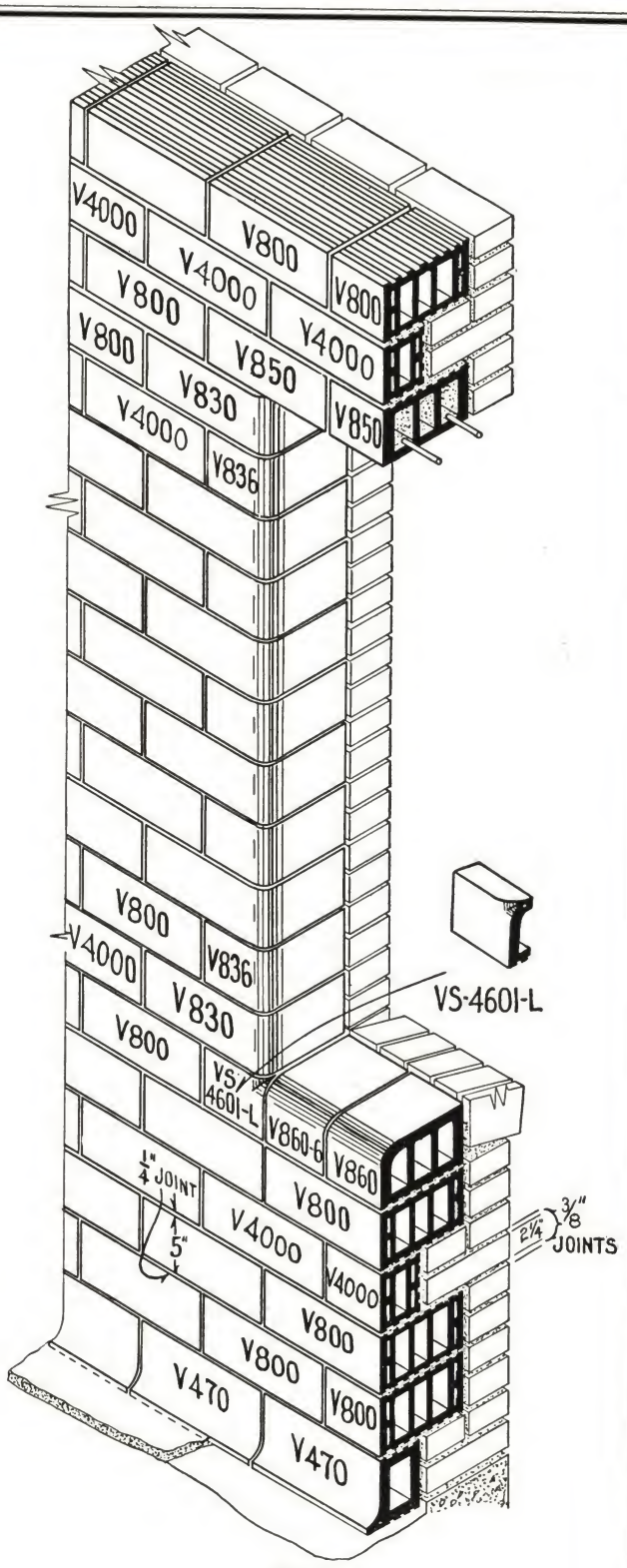


Fig. 16

Figs. 15 and 16 illustrate clearly how Vitritile is used as the structural part of exterior walls. Fig. 15 shows its use in connection with Natco Tex-Tile or Natco Glazed or Unglazed Combed Face Tile. Fig. 16 illustrates the same construction with an exterior of brick. Note perfect bond for maximum strength.

DETAILS OF VITRITILE CONSTRUCTION

SCALE 3/4" = 1'-0"

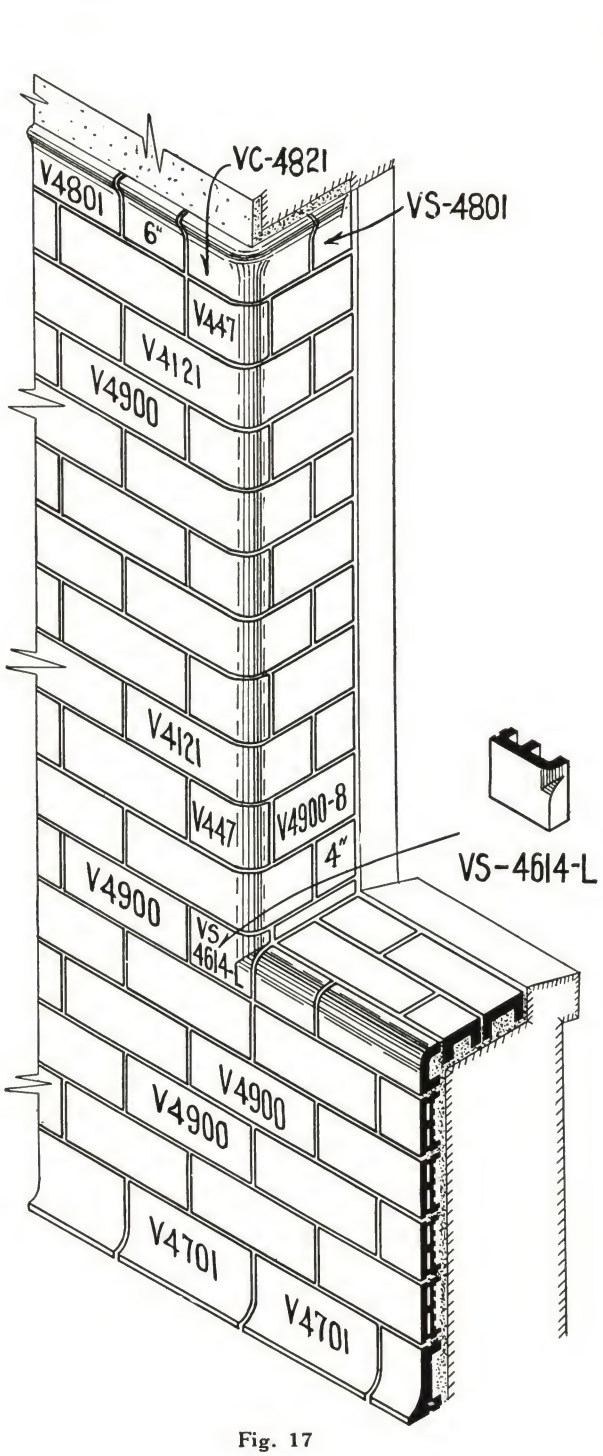


Fig. 17

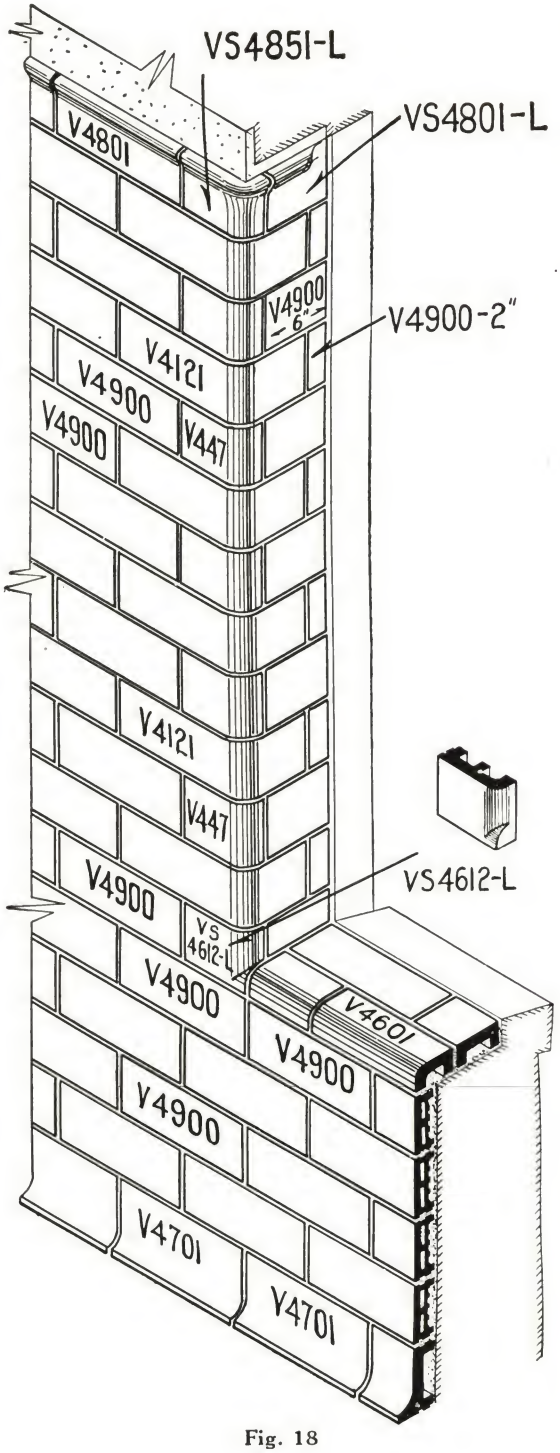


Fig. 18

Figs. 17 and 18 illustrate the use of Natco Vitritile Furring. Note attractive effects produced by use of bullnose jambs and sills. Choice of sills 1⅞", 3¾" or 5" high is made possible by three standard heights of sill starters, namely VS-4612, VS-4614 or VS-4601. This is very helpful in connection with the question of heights of sills from floors. See also Fig. 16 for VS-4601-L.

DETAILS OF VITRITILE CONSTRUCTION

SCALE ¾" = 1'-0"

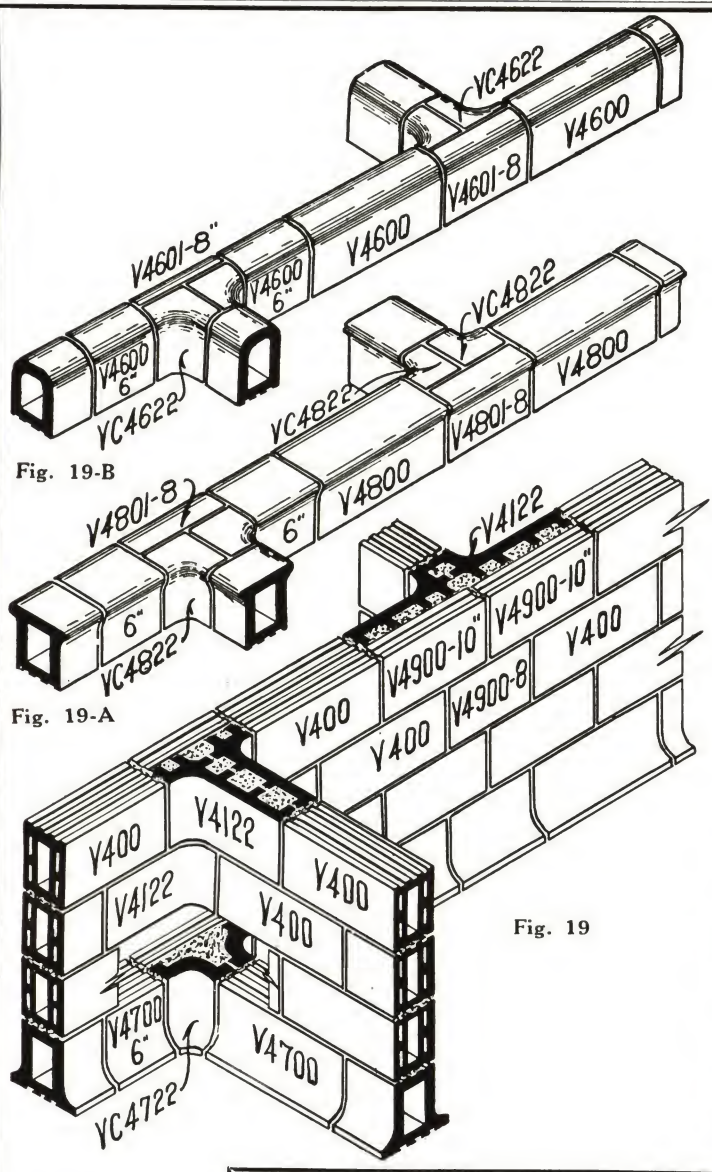


Fig. 19-B

Fig. 19-A

Fig. 19

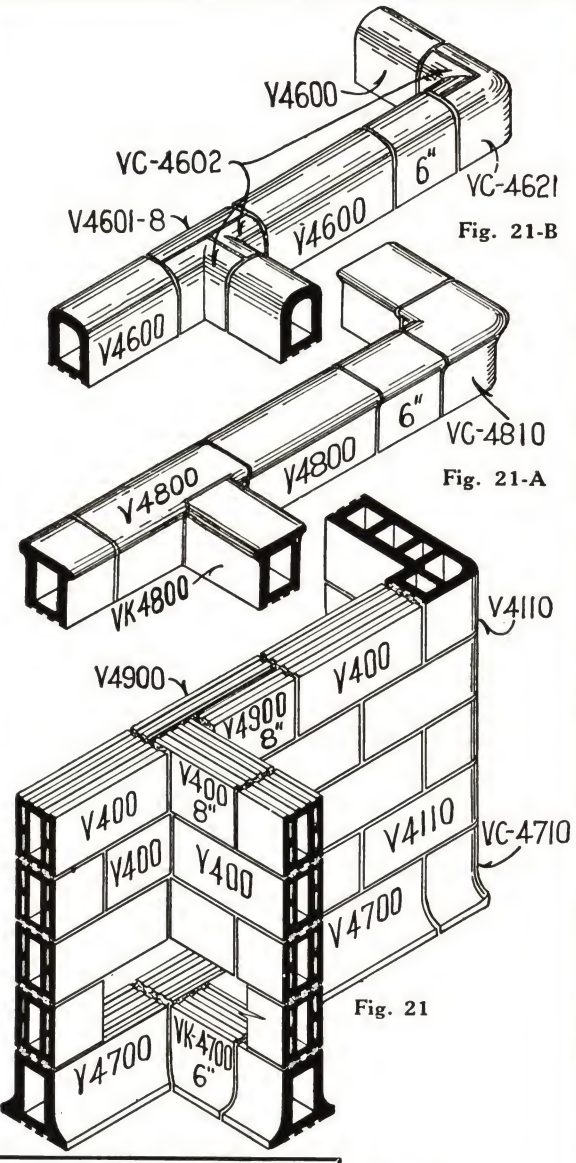


Fig. 21

Fig. 19
Illustrates use of cove internal corners in two faced partitions. Bonded cross partition.

Fig. 19-A
Wainscot capping used as top course of low partitions. See Fig. 19.

Fig. 19-B
Alternate construction showing bullnose coping as top course for low partitions. See Fig. 19.

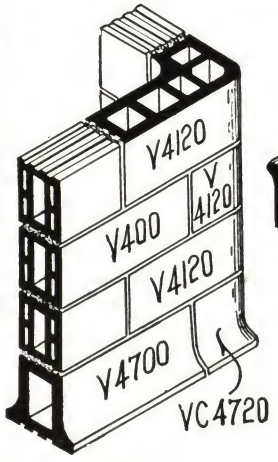


Fig. 20

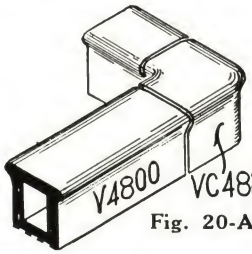


Fig. 20-A

Fig. 20-B

Fig. 20
Illustrates use of cove internal and bullnose external corners in two faced partitions.

Fig. 20-A
Wainscot capping used as top course of low partitions. See Fig. 20.

Fig. 20-B
Alternate construction showing bullnose coping as top course of low partitions. See Fig. 20.

Fig. 21
Illustrates use of square internal and bullnose external corners in two faced partitions. Bonded cross partition.

Fig. 21-A
Wainscot capping used as top course of low partitions. See Fig. 21.

Fig. 21-B
Alternate construction showing bullnose coping as top course for low partitions. See Fig. 21.

DETAILS OF VITRITILE CONSTRUCTION

SCALE ¾" = 1'-0"

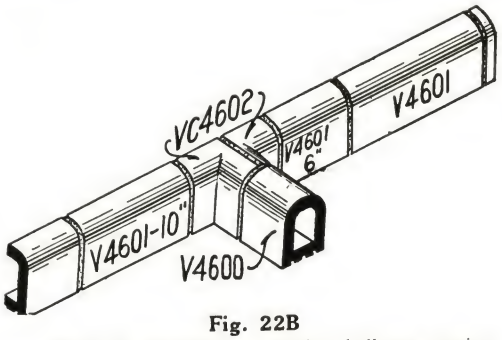


Fig. 22B

Alternate construction showing bullnose capping used in connection with construction as shown in Fig. 22 below

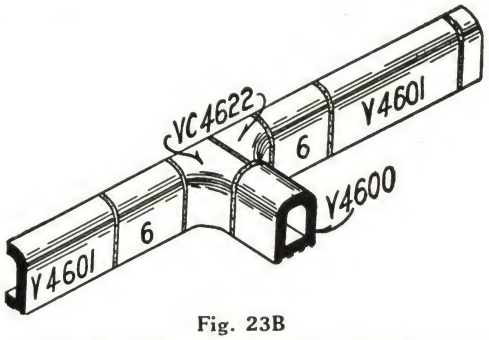


Fig. 23B

Alternate construction showing bullnose capping used in connection with construction as shown in Fig. 23 below

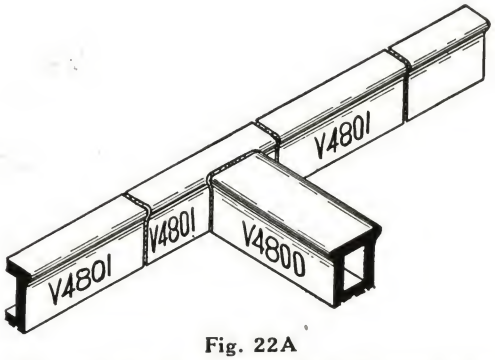


Fig. 22A

Wainscot capping used in connection with construction as shown in Fig. 22 below

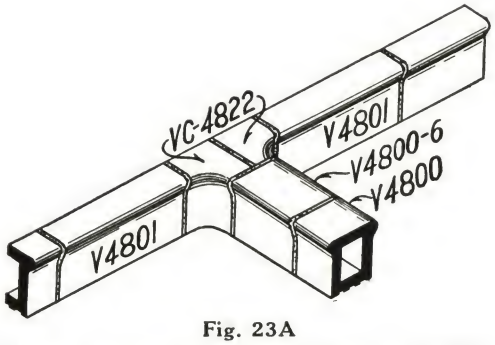


Fig. 23A

Wainscot capping used in connection with construction as shown in Fig. 23 below

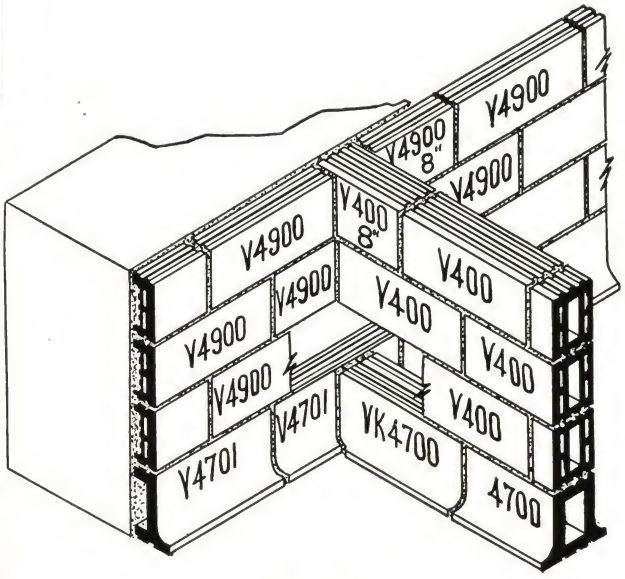


Fig. 22

Shows method of bonding partitions into furred walls—square internal corners

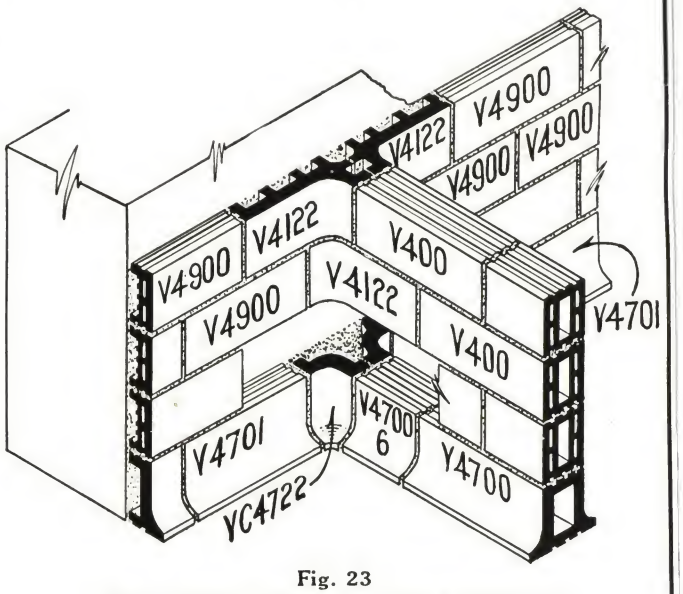


Fig. 23

Shows method of bonding two faced partitions into furred walls—coved internal corners

DETAILS OF VITRITILE CONSTRUCTION

SCALE ¾" = 1'-0"

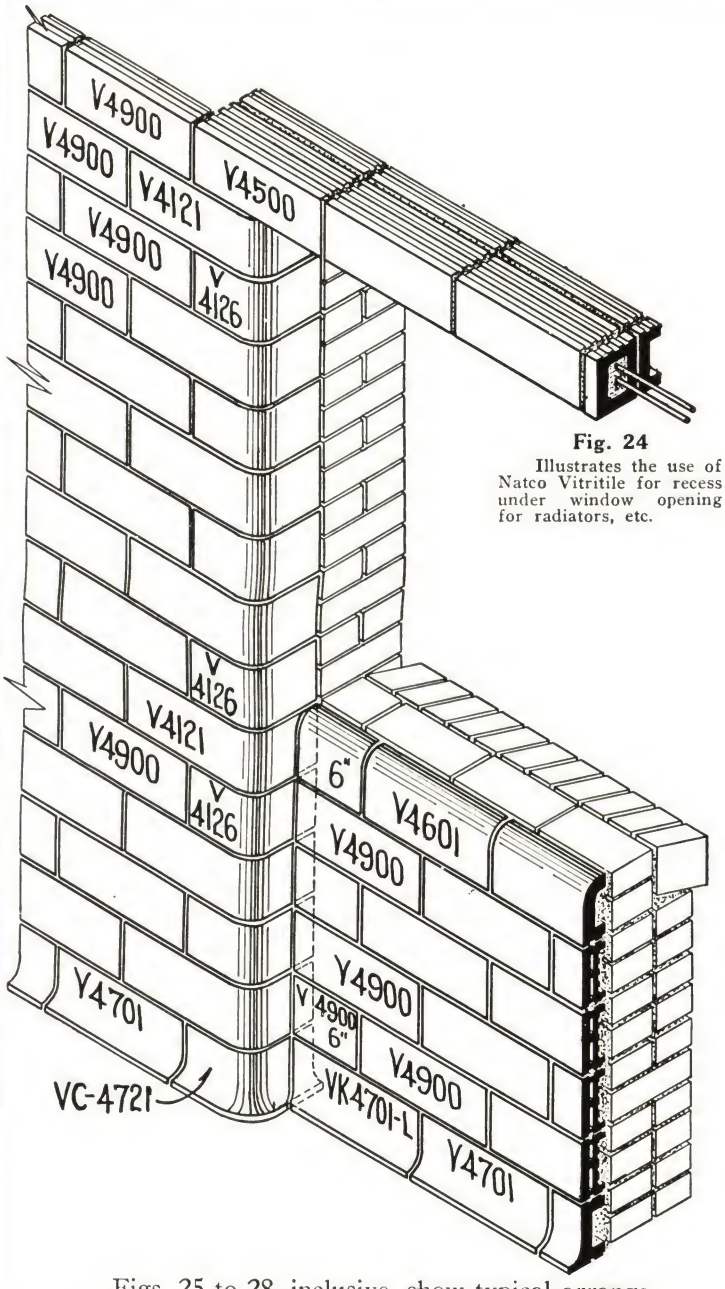


Fig. 24
Illustrates the use of Natco Vitritile for recess under window opening for radiators, etc.

Figs. 25 to 28, inclusive, show typical arrangements of 3¾" Vitritile for enclosing steel columns in exterior walls.

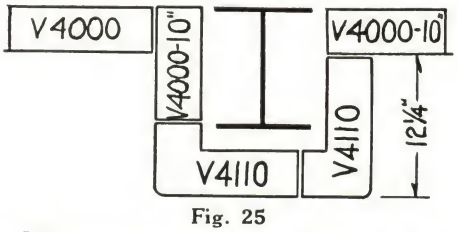


Fig. 25
One course shown, reverse for alternate course

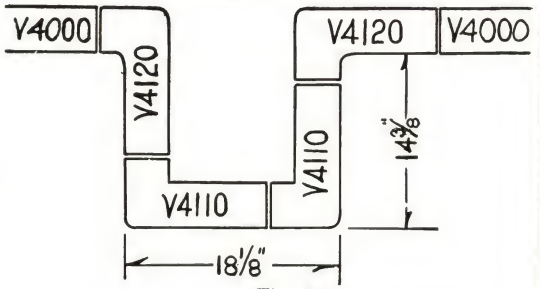
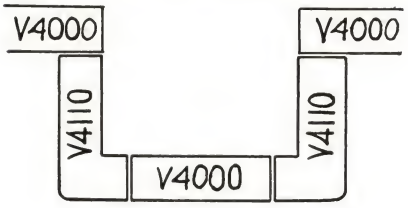


Fig. 26
One course shown—reverse for alternate courses



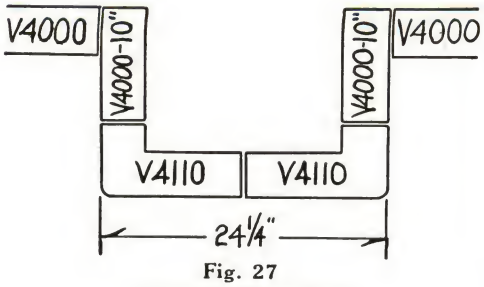
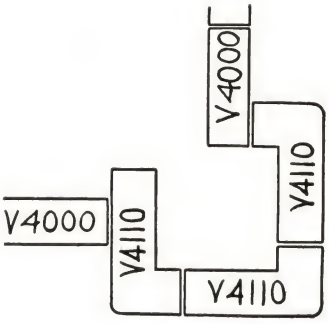


Fig. 27
Alternate courses shown



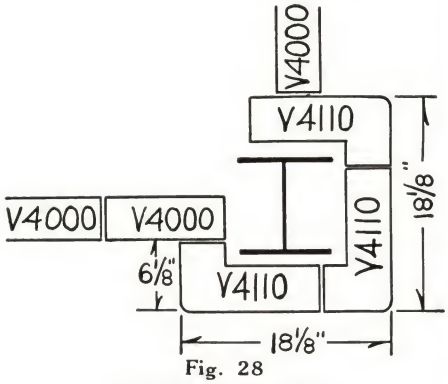


Fig. 28
Alternate courses shown

DETAILS OF VITRITILE CONSTRUCTION

SCALE ¾" = 1'-0"

TYPICAL ARRANGEMENT OF 1⅞" AND 3¾" VITRITILE FOR ENCLOSING FREE STANDING COLUMNS

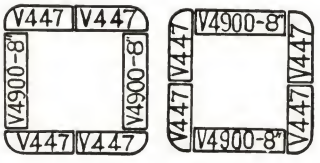


Fig. 29
Alternate courses of 1⅞" Vitritile covering for 8" column

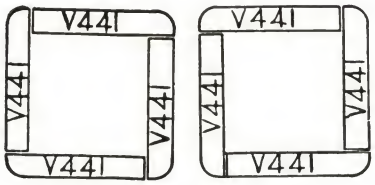


Fig. 30
Alternate courses of 1⅞" Vitritile covering for 10" column

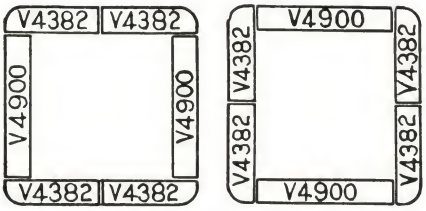


Fig. 31
Alternate courses of 1⅞" Vitritile covering for 12" column

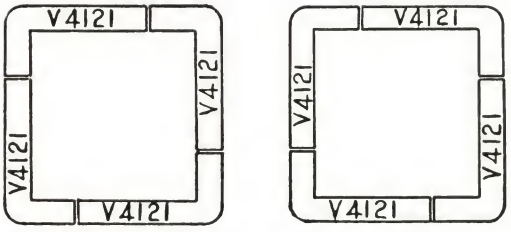


Fig. 32
Alternate courses of 1⅞" Vitritile covering for 14" column

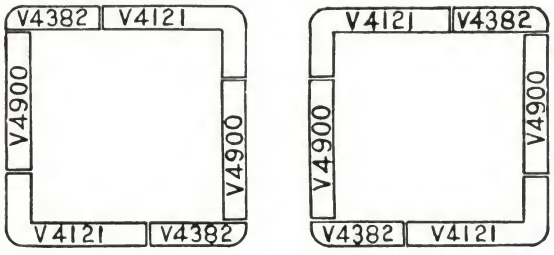


Fig. 33
Alternate courses of 1⅞" Vitritile covering for 16" column

Illustrations on this page are typical of what can be done with Natco Vitritile to fireproof and permanently beautify the structural members of buildings, no matter what the construction may be.

The types of construction shown are simply suggestive, and adaptations of them can be made to take care of practically every condition.

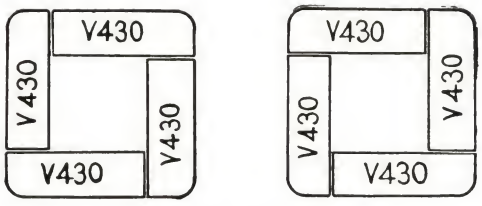


Fig. 34
Alternate courses of 3¾" Vitritile covering for 8" column

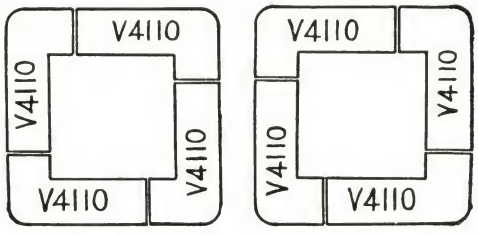


Fig. 35
Alternate courses of 3¾" Vitritile covering for 10" column

DETAILS OF VITRITILE CONSTRUCTION

SCALE ¾" = 1'-0"

TWO-FACED PARTITIONS OF VARIOUS THICKNESSES WITH SQUARE INTERNAL CORNERS AND BULLNOSE EXTERNAL CORNERS

(*NOTE:* Wainscot cap course similar to "A" course)

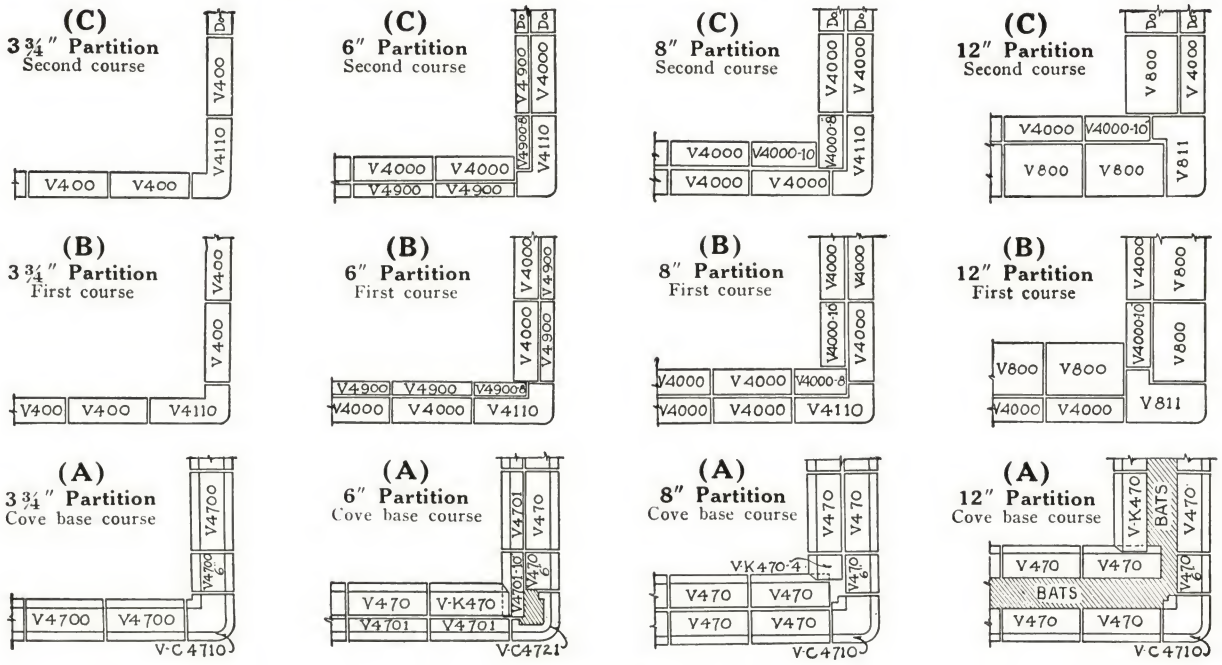


Fig. 36

TWO-FACED PARTITIONS OF VARIOUS THICKNESSES WITH COVED INTERNAL CORNERS AND BULLNOSE EXTERNAL CORNERS

(*NOTE:* Wainscot cap course similar to "A" course)

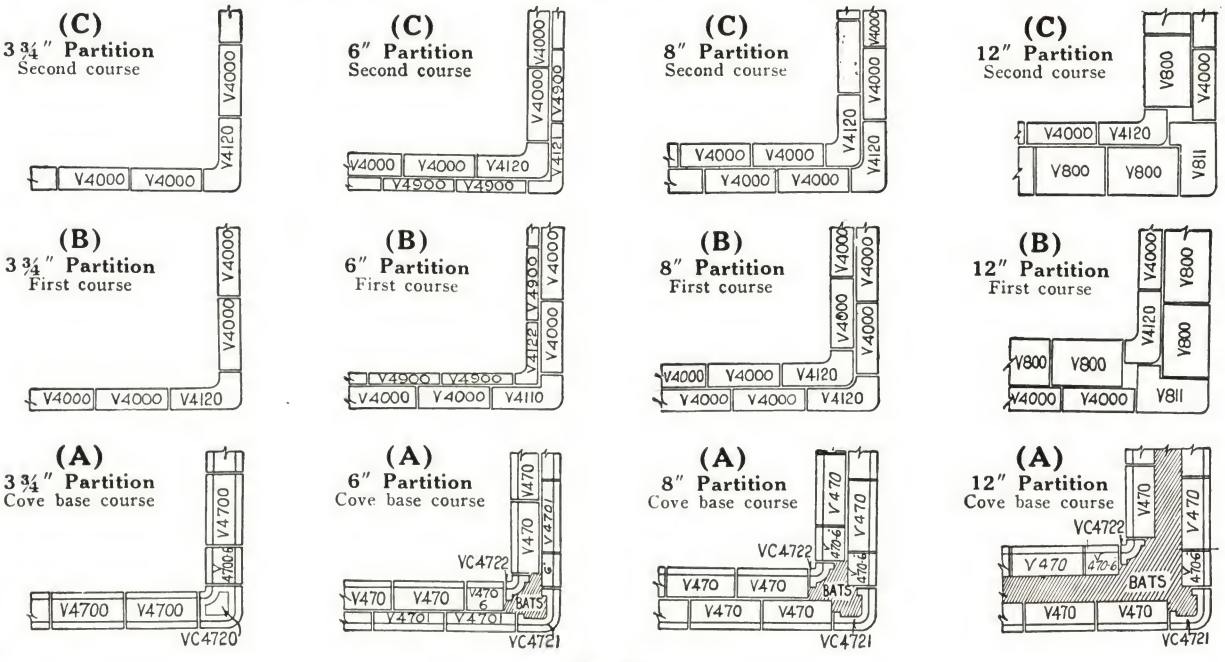


Fig. 37

NATCO VITRITILE CORNER DETAILS

SCALE ⅜" = 1'-0"

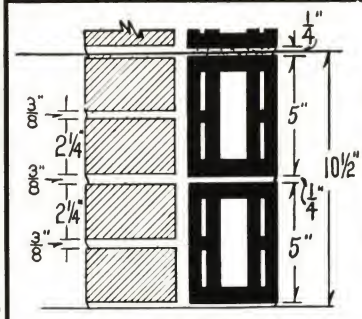


Fig. 38

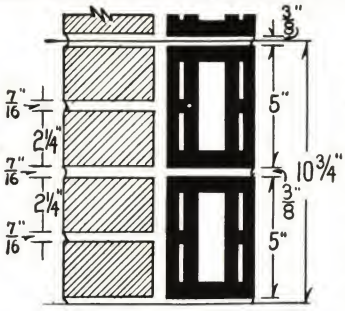


Fig. 39

Typical Relationship Between Brick and Tile Mortar Joints

Scale 1½" = 1' 0"

HEIGHT TABLE

Tile { 3¾" x 5" x 12" / 8" x 5" x 12" }
Joints ¼"

Course No.	Height
1	— 5¼"
2	—10½"
3	1'— 3¾"
4	1'— 9"
5	2'— 2¼"
6	2'— 7½"
7	3'— 0¾"
8	3'— 6"
9	3'—11¼"
10	4'— 4½"
11	4'— 9¾"
12	5'— 3"
13	5'— 8¼"
14	6'— 1½"
15	6'— 6¾"
16	7'— 0"
17	7'— 5¼"
18	7'—10½"
19	8'— 3¾"
20	8'— 9"
21	9'— 2¼"
22	9'— 7½"
23	10'— 0¾"
24	10'— 6"
25	10'—11¼"
26	11'— 4½"
27	11'— 9¾"
28	12'— 3"
29	12'— 8¼"
30	13'— 1½"
31	13'— 6¾"
32	14'— 0"
33	14'— 5¼"
34	14'—10½"
35	15'— 3¾"
36	15'— 9"
37	16'— 2¼"
38	16'— 7½"
39	17'— 0¾"
40	17'— 6"

The table above is used to determine the heights of walls which will best lay up without cutting tile, using ¼" bed joints. For instance, should you desire to build a wall 7' 0" high you will note that it will require 16 courses.

By varying the thickness of the mortar joints these dimensions may be slightly changed.

LENGTH TABLE

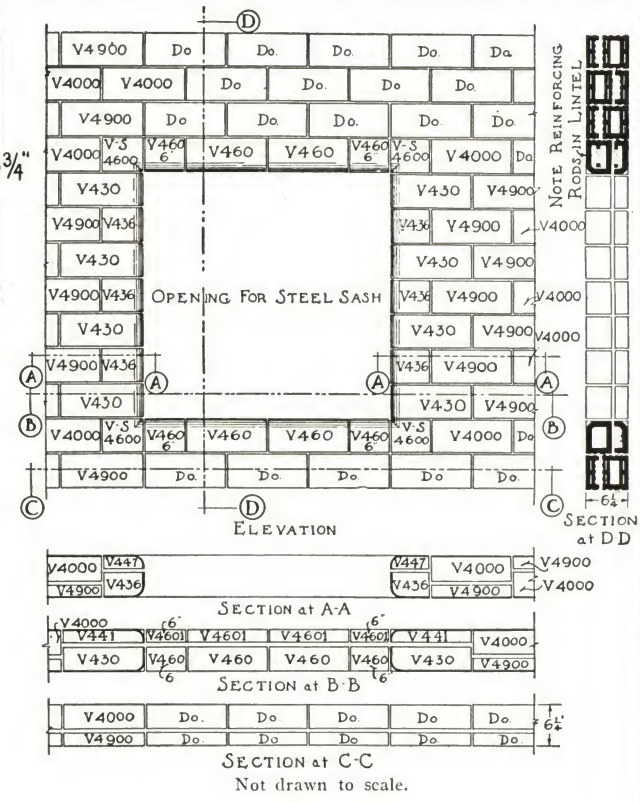
Tile { 3¾" x 5" x 12" / 8" x 5" x 12" }
Joints ¼"

No. Tile	Length
1	1'— 0"
1½	1'— 6⅛"
2	2'— 0¼"
2½	2'— 6⅜"
3	3'— 0½"
3½	3'— 6⅝"
4	4'— 0¾"
4½	4'— 6⅞"
5	5'— 1"
5½	5'— 7⅛"
6	6'— 1¼"
6½	6'— 7⅜"
7	7'— 1½"
7½	7'— 7⅝"
8	8'— 1¾"
8½	8'— 7⅞"
9	9'— 2"
9½	9'— 8⅛"
10	10'— 2¼"
10½	10'— 8⅜"
11	11'— 2½"
11½	11'— 8⅝"
12	12'— 2¾"
12½	12'— 8⅞"
13	13'— 3"
13½	13'— 9⅛"
14	14'— 3¼"
14½	14'— 9⅜"
15	15'— 3½"
15½	15'— 9⅝"
16	16'— 3¾"
16½	16'— 9⅞"
17	17'— 4"
17½	17'—10⅛"
18	18'— 4¼"
18½	18'—10⅜"
19	19'— 4½"
19½	19'—10⅝"
20	20'— 4¾"
20½	20'—10⅞"

The table above shows the length of walls and pilasters that will best lay up without cutting tile, using ¼" vertical mortar joints. For instance, should you desire a wall 9'-2" long you will note that it will require 9 tile.

To find width of openings, add two mortar joints or ½" to each dimension above.

The dimensions herein given are for the convenience of estimating only, and we, therefore, recommend that all joints be made uniform, ¼", ⅜" or whatever size may be agreed upon, and disregard bond to obtain the best results.



Not drawn to scale.

Fig. 40

Treatment of Openings in 6" Natco Vitritile Partition for Steel Sash

Illustration shows use of bullnose sills, lintels and jambs; V-600 or V-6000 may be used in place of V-890 and V-4900

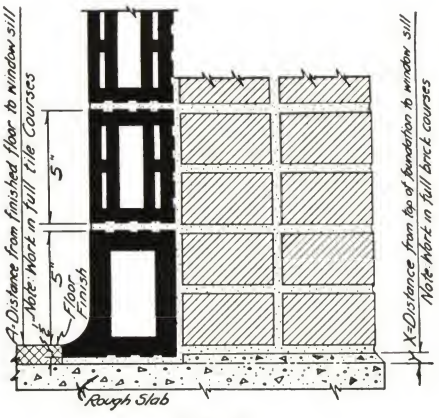


Fig. 41

Not drawn to scale

Suggestions for Starting Natco Vitritile Cove Base from Masonry Foundation

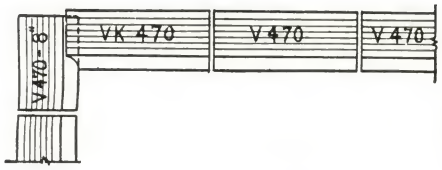
(1) Establish sill height (A) above the finished floor in full courses of tile.

(2) Having sill length (A) and thickness of brick courses, distance (X) can be determined.

(3) With top of foundation fixed, figure distance (Y) to suit thickness of floor finish.

Note: Illustration shows ¼" joints in Vitritile and ⅜" exterior brick joints.

NATCO VITRITILE—DESIGN DATA



Left
Plan and Elevation of Intersection of 3¾" Single Cove Base, showing use of coped cove base, V-K470. (left hand.)

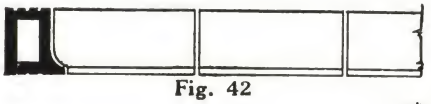
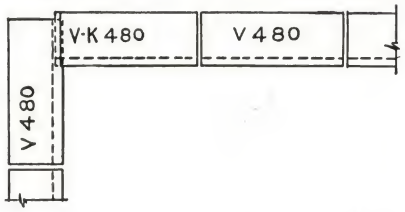


Fig. 42



Right
Plan and Elevation of Intersection of 3¾" Single Wainscot Cap showing use of coped wainscot cap, V-K480 (left hand).

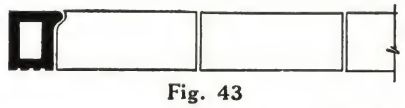
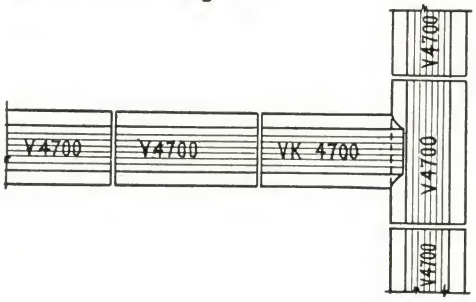


Fig. 43



Left
Plan and Elevation of Intersection of 3¾" Double Cove Base showing use of coped cove base, V-K4700.

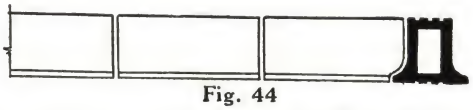
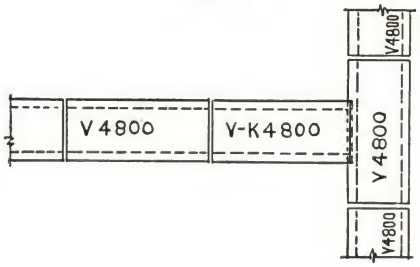


Fig. 44



Right
Plan and Elevation of Intersection of 3¾" Double Wainscot Cap showing use of coped wainscot cap, V-K4800.

Scale ¾" = 1′ 0"

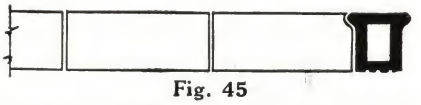
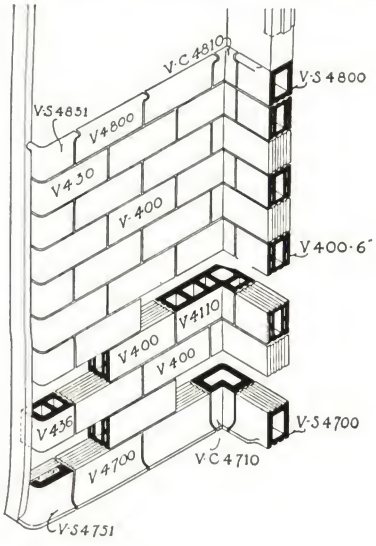


Fig. 45

DOOR CONSTRUCTION—TWO-FACE PARTITIONS

3¾" double-faced partition showing three types of door construction. Note use of various types of door stops and method of filling jamb tiles with mortar at door at left to stiffen the construction.



At left hand, door stops VS-4761 and VS-4861 may be used instead of VS-4751 and VS-4851 respectively.

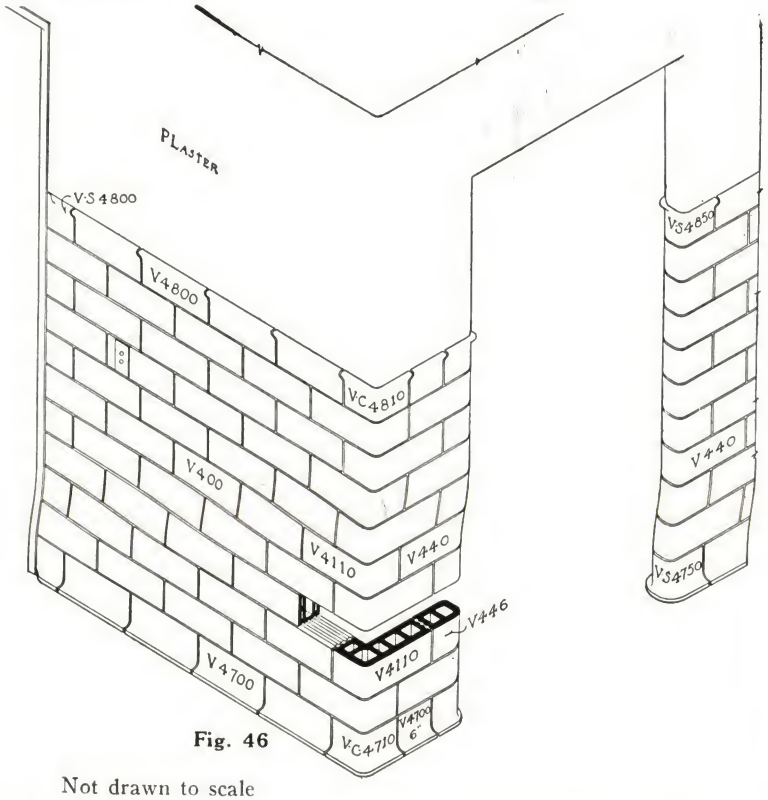


Fig. 46

Not drawn to scale

NATCO VITRITILE DETAILS

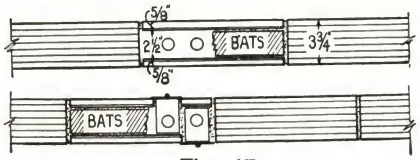


Fig. 47

Illustrates the use of V-4902 for working around electrical conduit in 3¾" two faced wall

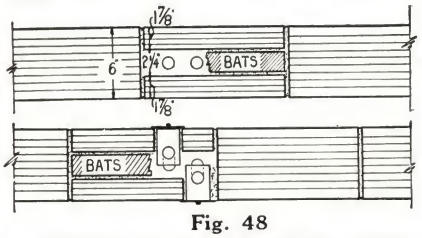


Fig. 48

Illustrates the use of V-4900 for working around electrical conduit in a 6" wall

Figs. 47 to 51 inclusive show method of enclosing electric conduit and fittings, also water, vent and soil pipes within Vitritile walls. Space is obtained by use of 5/8", 1½" and 1⅞" thickness of Vitritile as may be necessary to face the wall at the conduit or piping.

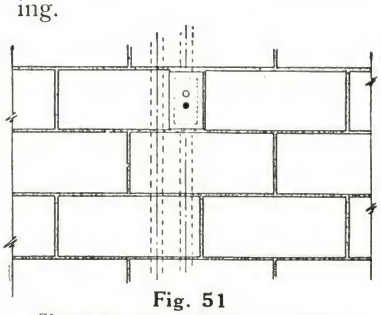


Fig. 51

Shows flush plate in place. Dotted lines indicate conduits

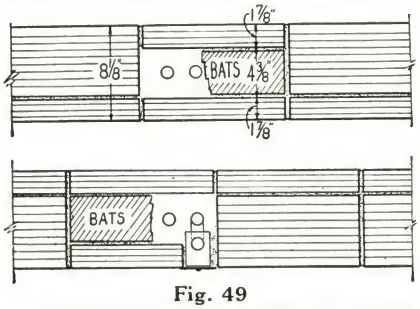


Fig. 49

Illustrates the use of V-4900 for working around electrical conduits in 8⅛" wall of bonded V-600's and V-4900's

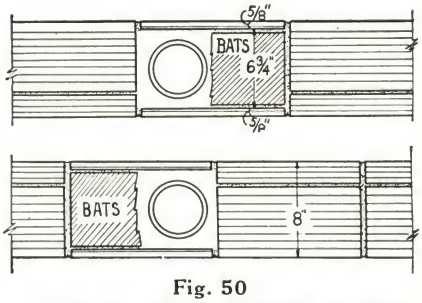


Fig. 50

Illustrates the use of V-4902's for taking care of large pipes in 8" walls of bonded V-600's or 6000's and V-4900's

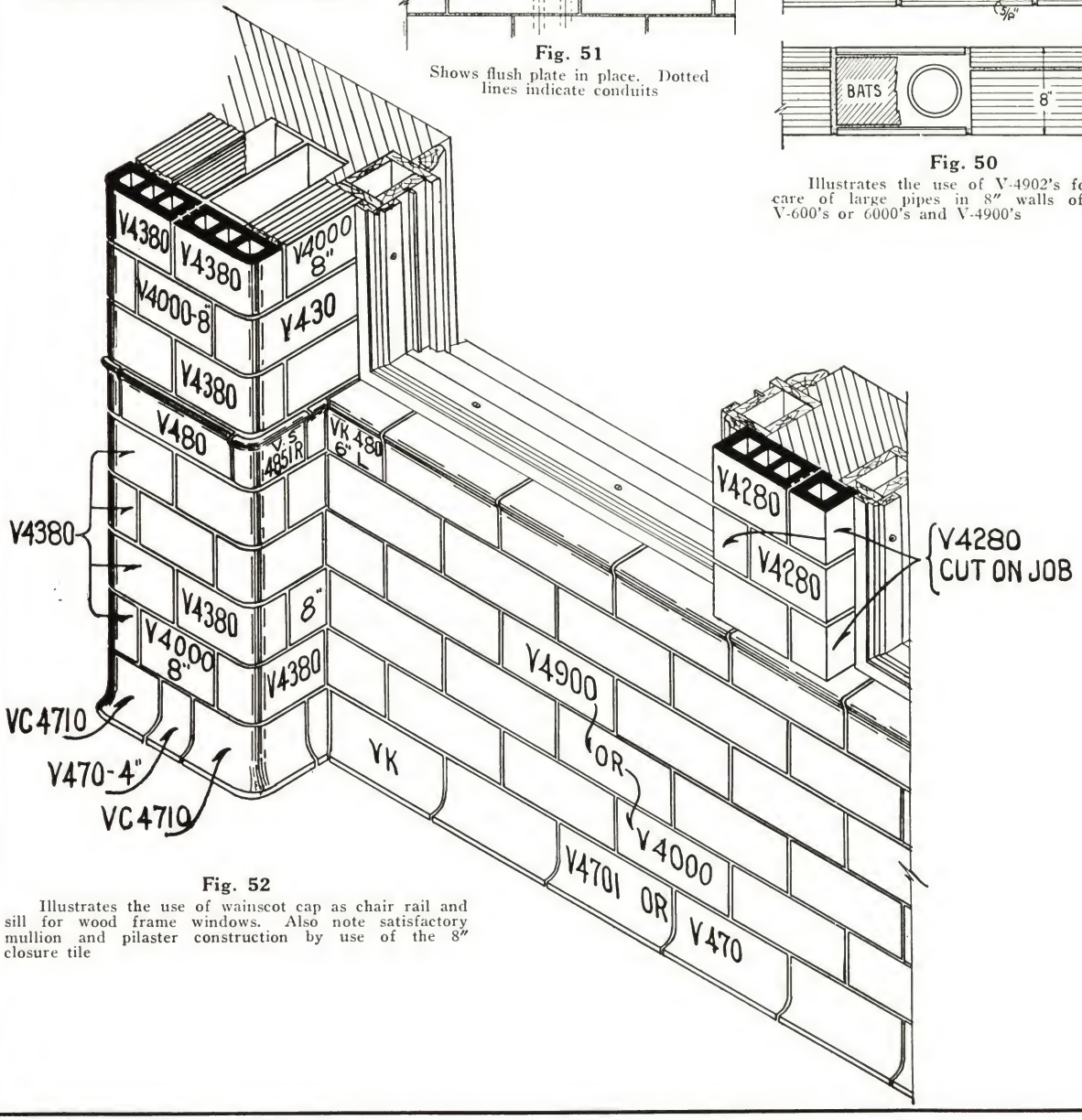


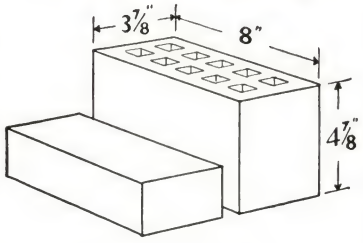
Fig. 52

Illustrates the use of wainscot cap as chair rail and sill for wood frame windows. Also note satisfactory mullion and pilaster construction by use of the 8" closure tile

NATCO VITRITILE DETAILS

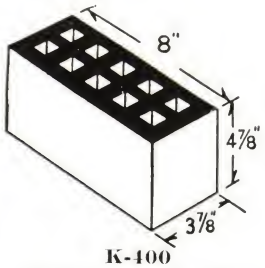
SCALE ¾" = 1'-0"

NATCO VITRIBRIK

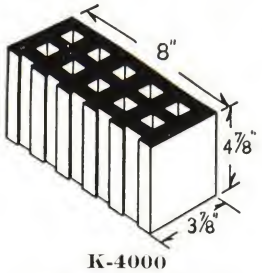


Natco Vitribrik has been developed to meet the demand for a double brick size unit, suitable for interior and exterior load bearing and non-load bearing walls and partitions.

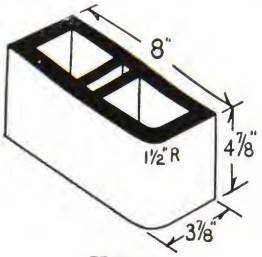
Natco Vitribrik is an attractive, sturdy structural fire-clay tile unit, with a permanent and resistive salt glaze finish. Furnished in a pleasing golden-tan color range. Uniform shades not being desirable, are not furnished. The permanent, enduring salt glaze finish is sanitary, easily cleaned and kept clean. In addition, Natco Vitribrik has all the advantages common to Natco Structural Clay Tile—permanence, strength, insulating qualities, fire-safety and freedom from maintenance and repairs. Various shapes to meet varying structural needs are available, and are illustrated on this and the succeeding page. Because of the size of the unit, very few special shapes are required. The sketch shows the dimensions of the standard stretcher unit, and gives an idea of the size as compared to a standard brick.



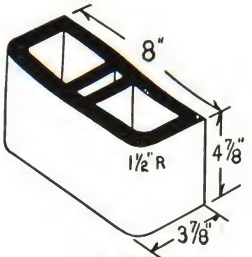
K-400
Stretcher, Smooth 2 Sides



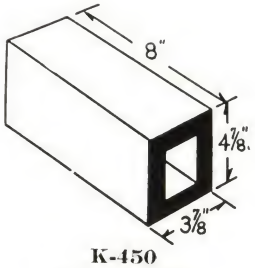
K-4000
Stretcher, Smooth 1 Side Scored 1 Side



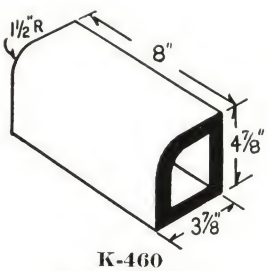
K-430
Bullnose Closure Corner Smooth 2 Sides



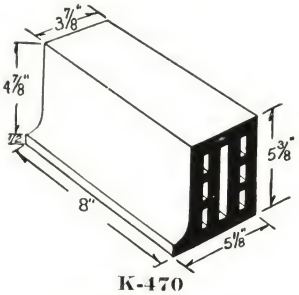
K-4310
Double Bullnose Closure Tile



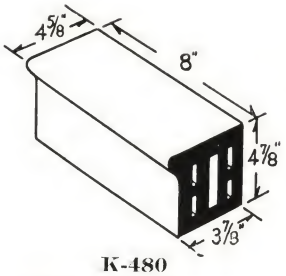
K-450
Square Sill Tile



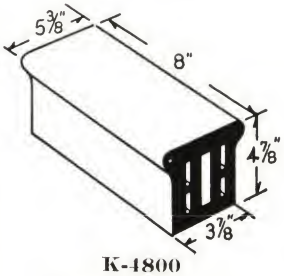
K-460
Bullnose Sill Tile



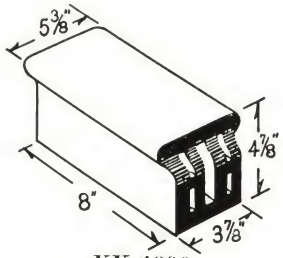
K-470
Single Cove Base



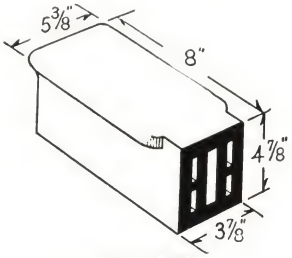
K-480
Wainscot Cap Stretcher



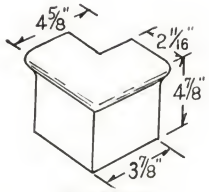
K-4800
Double Wainscot Cap Stretcher



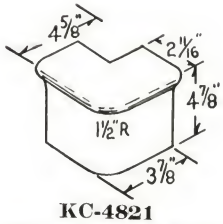
KK-4800
Double Wainscot Cap Coped



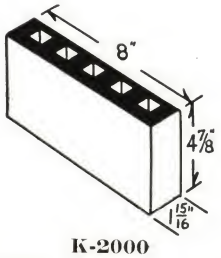
KS-4800
Double Wainscot Cap Stop



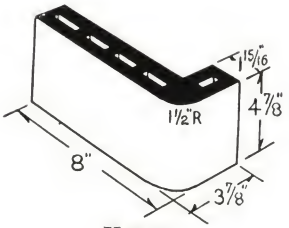
KC-4891
Square External Wainscot Cap Corner



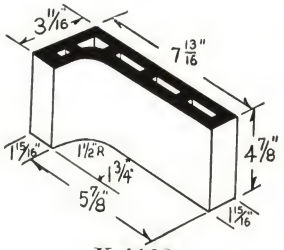
KC-4821
Bullnose External Wainscot Cap Corner



K-2000
Furring, Stretcher Smooth 1 Side

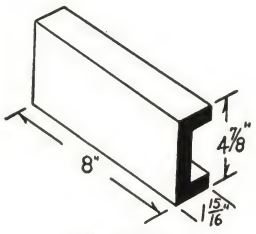


K-4121
Furring, Bullnose External Corner

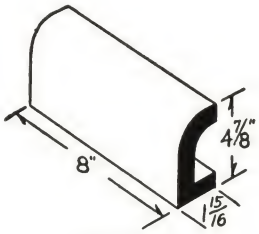


K-4122
Furring, Coved Internal Corner

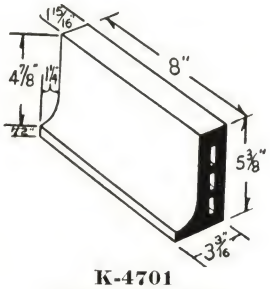
NATCO VITRIBRIK—SIZES AND SHAPES



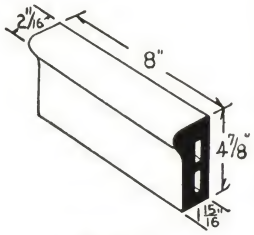
K-4501
Furring, Square Sill or Lintel Tile



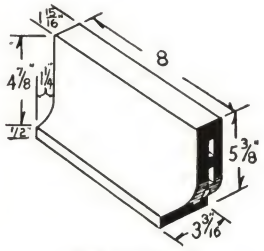
K-4601
Furring, Bullnose Sill or Lintel



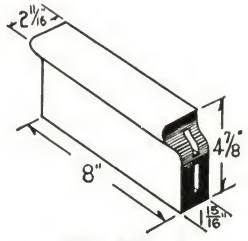
K-4701
Furring, Cove Base



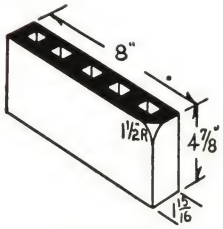
K-4801
Furring, Wainscot Cap



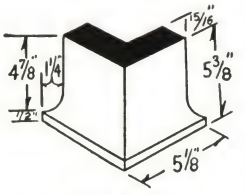
KK-4701-R
Furring, Cove Base Coped Right—Left Hand opposite



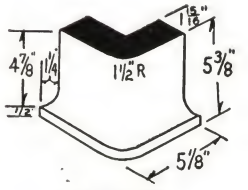
KK-4801-R
Furring, Wainscot Cap Coped Right—Left Hand opposite



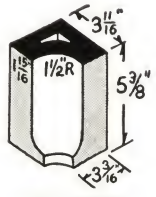
KS-4601-L
Furring, Bullnose Sill or Lintel Starter Left Hand—Right Hand opposite



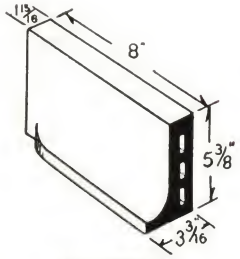
KC-4701
Furring, Cove Base Square External Corner



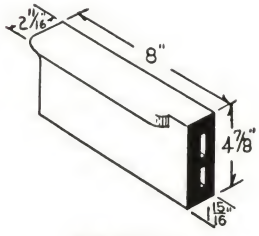
KC-4721
Furring, Cove Base Bullnose External Corner



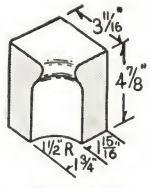
KC-4722
Furring, Cove Base Coved Internal Corner, 1½" radius of internal corner



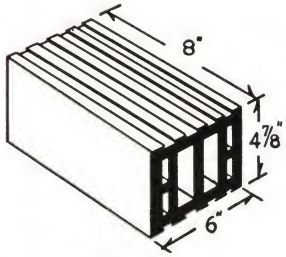
KS-4701-R
Furring, Cove Base Stop Right—Left Hand opposite



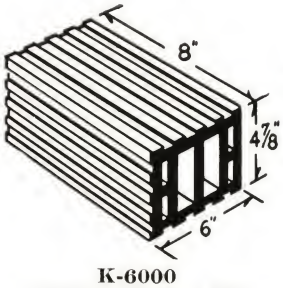
KS-4801-L
Furring, Wainscot Cap Stop Left—Right Hand opposite



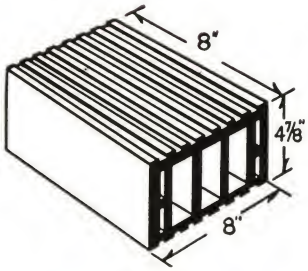
KC-4822
Furring, Wainscot Cap Coved Internal Corner, 1½" radius of internal corner



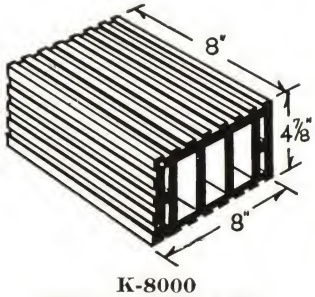
K-600
Stretcher, Smooth 2 Sides



K-6000
Stretcher, Smooth 1 Side Scored 1 Side



K-800
Stretcher, Smooth 2 Sides



K-8000
Stretcher, Smooth 1 Side Scored 1 Side

NATCO VITRIBRIK—SIZES AND SHAPES

NATCO DOUBLE SHELL FACE TILE

General

Natco Double Shell Face Tile (Load Bearing) provides a most economical form of masonry construction.

The double shell feature adds to the comfort and strength of the completed structure. A multiple blanket of isolated air cells is located on both the exterior and interior face of the tile forming a barrier to heat transmission. All mortar joints are non-continuous, thus moisture cannot be drawn through by capillary attraction. The voids in the double shell key with the mortar adding strength and stability to the wall. (See also Natco Page 31.)

Each tile laid forms a section of an insulated moisture resisting wall, with an attractively finished exterior face. Upkeep is negligible, as the tile does not discolor, disintegrate or weather—obviously painting or similar maintenance is eliminated.

Each unit is equivalent to six brick, easily and quickly laid, effecting considerable labor and mortar savings.

Made with a 5″ x 12″ face for 8″ walls, complete with all accessory shapes for sills, jambs, lintels, etc. Also in 10⅜″x12″ face for 8″ walls, for ashlar bond. (See Natco Page 35 for architectural detail.)

Unglazed Tex-Tile (Designated by T)

Natco Unglazed Tex-Tile has a texture face resembling a high quality tapestry brick. To meet individual preferences, it is furnished in three (3) color combinations. These are termed Shade Ranges E-1, E-2 and E-3. In Shade Range E-1, the browns predominate. In Shade Range E-3 the reds predominate. In Shade Range E-2 a combination (full range) of Shade Ranges E-1 and E-3 is obtained which is extremely beautiful. The inside face is scored for plaster. (A color chart showing these shade ranges will be sent on request.)

Glazed Tex-Tile (Designated by TG)

Natco Glazed Tex-Tile has the same texture finish as the unglazed and is furnished in dark brownish shades. The inside face is scored for plaster.

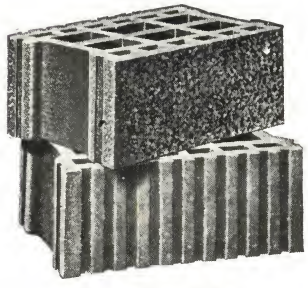
Glazed Combed Face Tile (Designated by B)

Natco Glazed Combed Face Tile has an exterior scratched or combed face and a glazed, smooth, sanitary, easily cleaned interior surface. It is furnished for walls 8″ thick.

Natco Unglazed Combed Face Tile is furnished with unglazed, combed exterior and smooth interior faces.

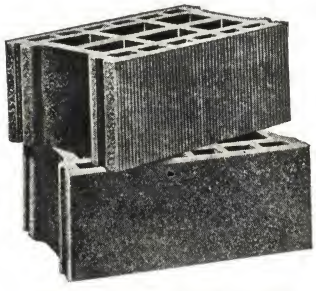
Adaptability

Natco Double Shell Face Tile is extensively and successfully used for residences, churches, schools, garages, factories, warehouses, gas stations, etc. It is the logical choice for any structure where attractiveness, permanence and comfort must be combined with economy.



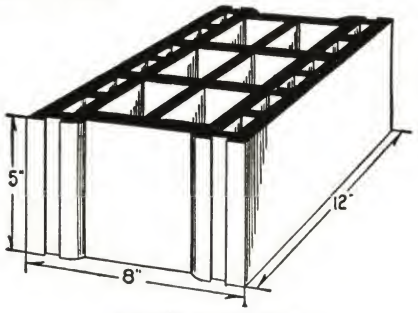
Natco Tex-Tile

Furnished with outside face either unglazed or glazed with the inside face scored for plaster

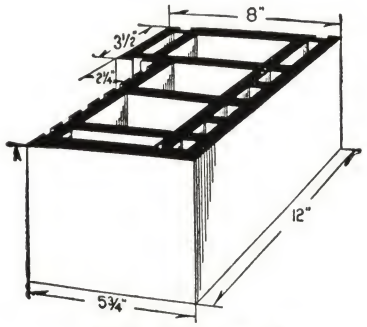


Natco Combed Face Tile

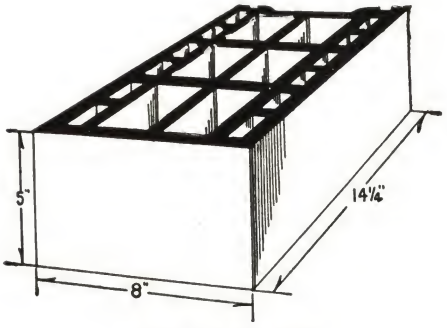
Furnished with outside face glazed and the inside face smooth glazed for exposed interior finish



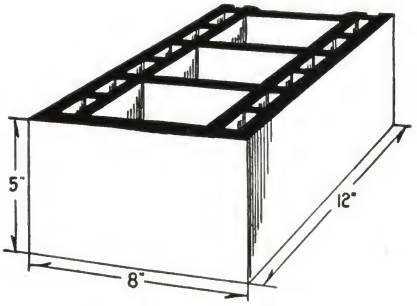
T-80; TG-80; B-80
8″ Wall Tile



T-82; TG-82; B-82
8″ Corner



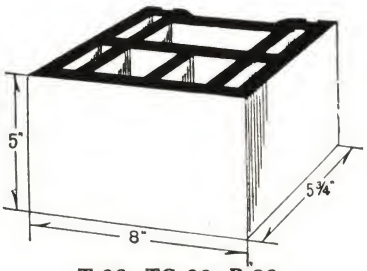
T-88; TG-88; B-88
8″ Inside Corner



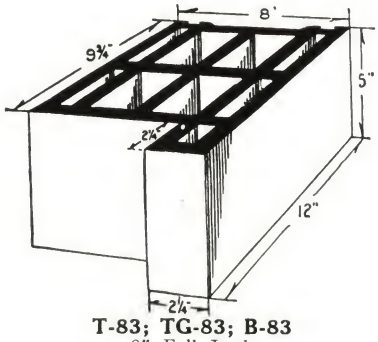
T-85; TG-85; B-85
8″ Closure

T-41; TG-41; B-41
1″ x 4″ x 12″ Joist Bearing Slab
See Fig. 5, Page 32

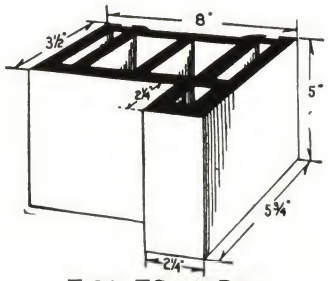
NATCO DOUBLE SHELL FACE TILE



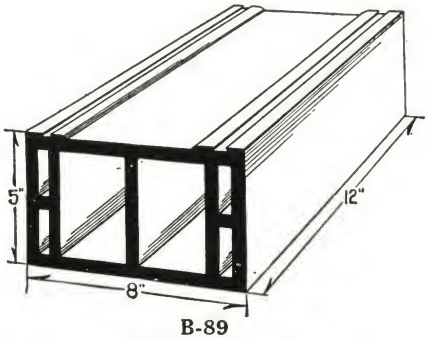
T-86; TG-86; B-86
8″ Half Closure



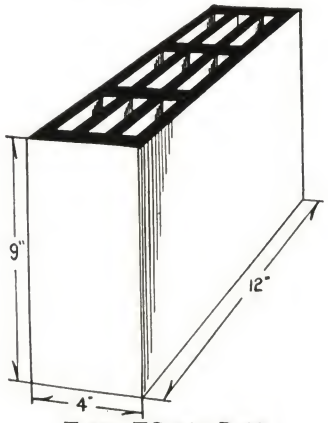
T-83; TG-83; B-83
8″ Full Jamb



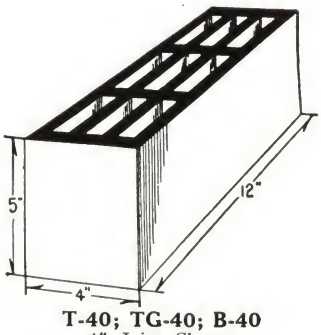
T-84; TG-84; B-84
8″ Half Jamb



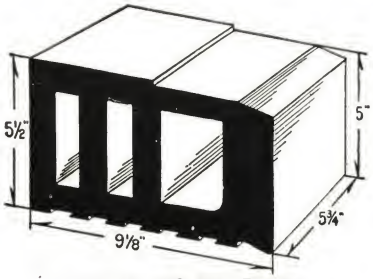
B-89
8″ Straight Lintel
Furnished in Combed Face only. (See T-89, TG-89, Page 31



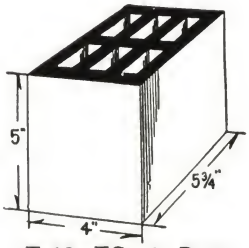
T-49; TG-49; B-49
4″ Joist Filler



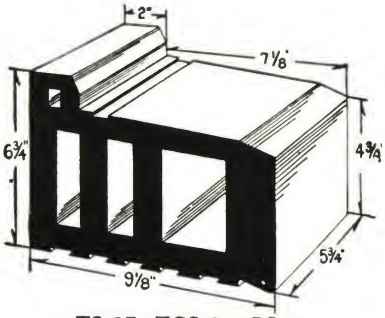
T-40; TG-40; B-40
4″ Joist Closure



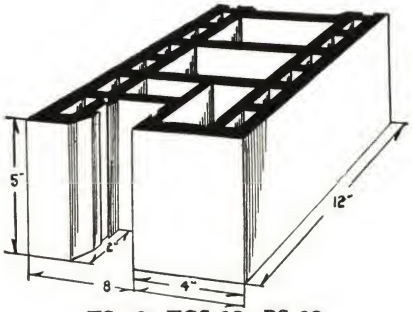
T-87; TG-87; B-87
8″ Sill Tile



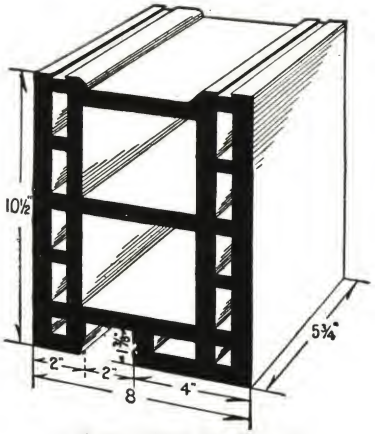
T-46; TG-46; B-46
Pilaster Tile



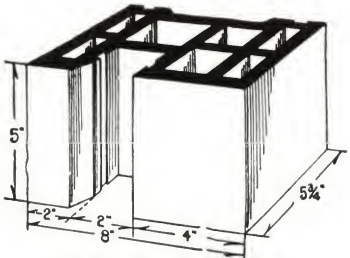
TS-87; TGS-87; BS-87
8″ Sill for Steel Sash



TS-83; TGS-83; BS-83
8″ Full Jamb for Steel Sash and for Plank Frame Windows and Doors

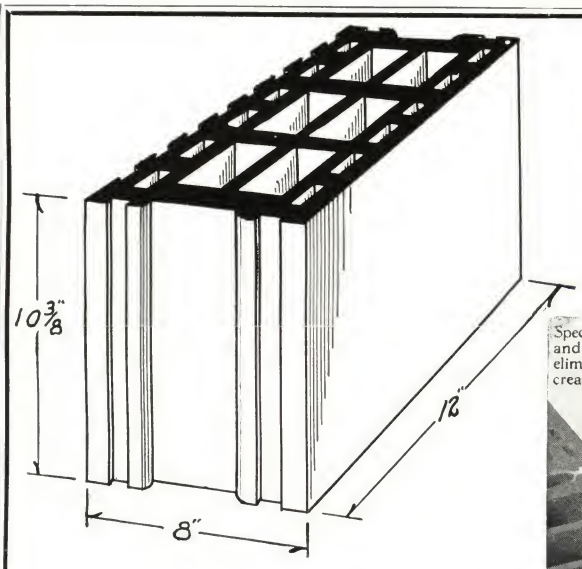


TS-89; TGS-89; BS-89;
8″ Soldier Lintel for Steel Sash. (Note: This lintel is also used extensively with wood frame windows and for soldier courses)



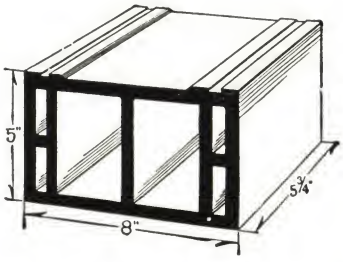
TS-84; TGS-84; BS-84
8″ Half Jamb for Steel Sash and for Plank Frame Windows and Doors

NATCO DOUBLE SHELL FACE TILE



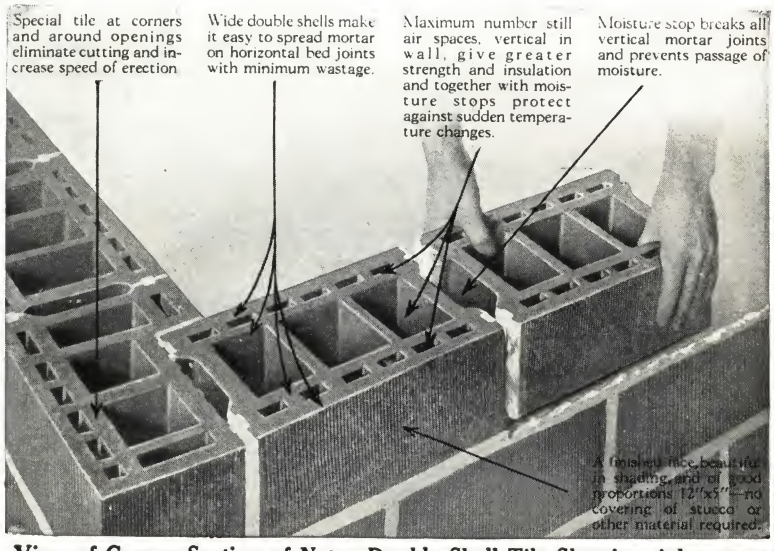
T-100

Random bond unit. Textile only; glazed or unglazed. See page 35 for architectural detail



T-89; TG-89

8" Straight Lintel. See B-89, Page 30. Furnished in Tex-Tile only



View of Corner Section of Natco Double Shell Tile Showing Advantages of Double Shell Construction

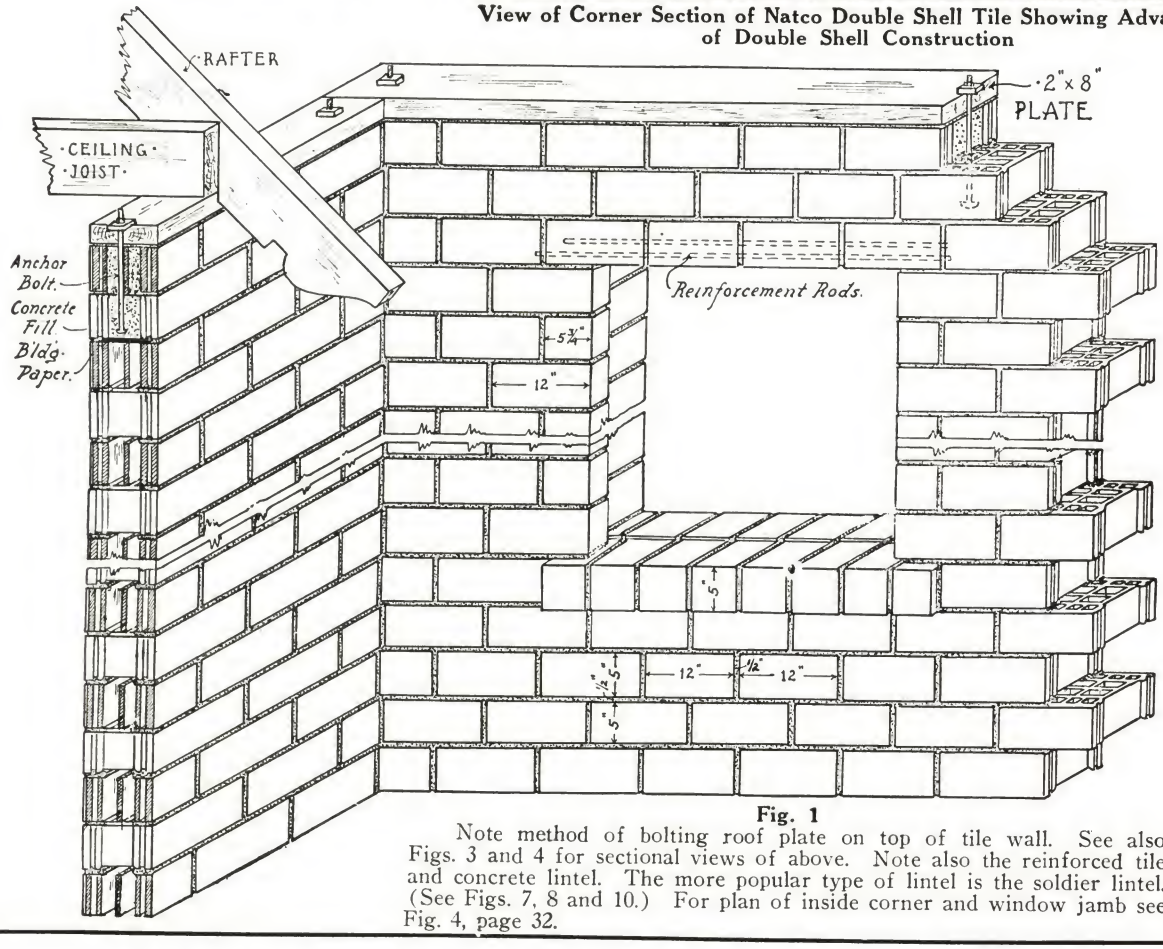


Fig. 1

Note method of bolting roof plate on top of tile wall. See also Figs. 3 and 4 for sectional views of above. Note also the reinforced tile and concrete lintel. The more popular type of lintel is the soldier lintel. (See Figs. 7, 8 and 10.) For plan of inside corner and window jamb see Fig. 4, page 32.

NATCO DOUBLE SHELL FACE TILE

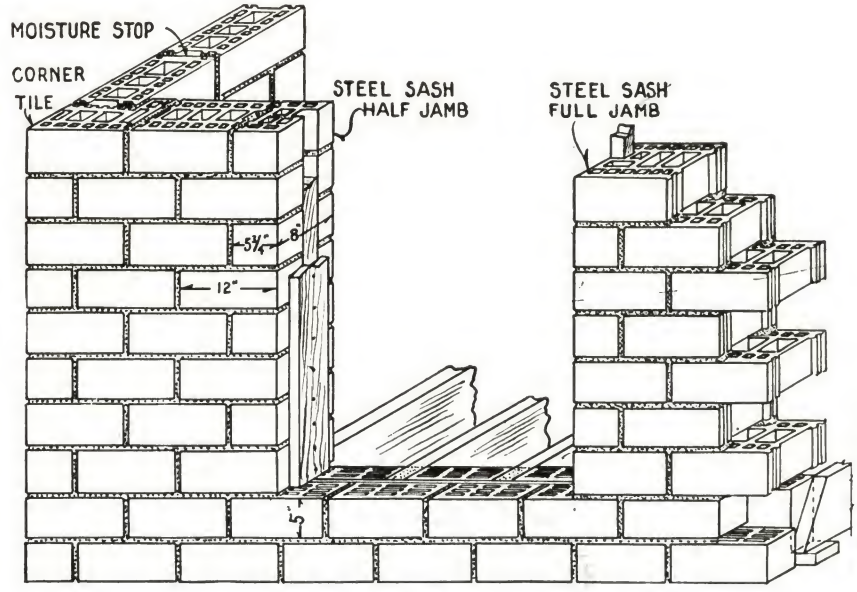


Fig. 2

Shows ordinary outside corner construction. Also shows method of making an absolutely weatherproof joint between tile and plank frame by using a strip of wood which has been nailed to the frame. This strip should fit into the recess in the tile. This method is recommended for all plank frames

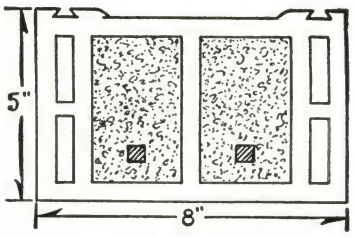


Fig. 3

Flat lintel showing reinforcing rods and concrete in both cells of tile. (See Fig. 1)

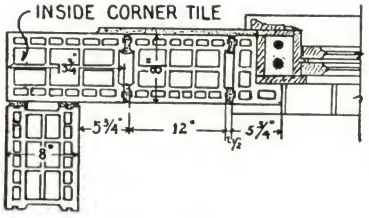


Fig. 4

Longitudinal cross section of wall shown in Fig. 1. Note jamb tile which provides space for sash weight box. Note the inside corner construction. This type of corner is required in ell shaped walls only

Course No.	Height
1	— 5⅜"
2	—10¾"
3	1′— 4⅛"
4	1′— 9½"
5	2′— 2⅞"
6	2′— 8¼"
7	3′— 1⅝"
8	3′— 7"
9	4′— 0⅜"
10	4′— 5¾"
11	4′—11⅛"
12	5′— 4½"
13	5′— 9⅞"
14	6′— 3¼"
15	6′— 8⅝"
16	7′— 2"
17	7′— 7⅜"
18	8′— 0¾"
19	8′— 6⅛"
20	8′—11½"
21	9′— 4⅞"
22	9′—10¼"
23	10′— 3⅝"
24	10′— 9"
25	11′— 2⅜"
26	11′— 7¾"
27	12′— 1⅛"
28	12′— 6½"
29	12′—11⅞"
30	13′— 5¼"
31	13′—10⅝"
32	14′— 4"
33	14′— 9⅜"
34	15′— 2¾"
35	15′— 8⅛"
36	16′— 1½"
37	16′— 6⅞"

Height Table

Tile 5" x 8" x 12"
Joint ⅜"

The table at the left is used to determine the height of walls which will best lay up without cutting tile, using ⅜" bed joint.

Length Table

Tile 5" x 8" x 12"
Joint ⅜"

The table at the right shows the length of walls that can be best laid without cutting tile, using ⅜" vertical mortar joint.

For window openings add ⅜" to height table and ¾" to length table.

The dimensions herein given are for the convenience of estimating only, and we, therefore, recommend that all joints be made uniform, ⅜", ½", or whatever size may be agreed upon, and disregard bond to obtain the best results.

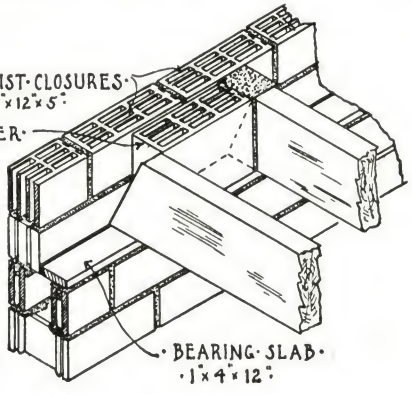


Fig. 5

Shows method of building wood joists in wall. Joist closure tile are used for exterior 4" of wall and by using 1" tile slabs bedded in mortar for the joists to rest on, the joists get a solid and flat bearing surface and the load is evenly distributed. The space between joists is filled with joist filler tile to make a solid wall to top of joists. Joists may be spaced as desired. Illustration shows joists 14" on centers.

No. Tile	Length
1	1′— 0"
1½	1′— 6⅛"
2	2′— 0⅜"
2½	2′— 6½"
3	3′— 0¾"
3½	3′— 6⅞"
4	4′— 1⅛"
4½	4′— 7¼"
5	5′— 1½"
5½	5′— 7⅝"
6	6′— 1⅞"
6½	6′— 8"
7	7′— 2¼"
7½	7′— 8⅜"
8	8′— 2⅝"
8½	8′— 8¾"
9	9′— 3"
9½	9′— 9⅛"
10	10′— 3⅜"
10½	10′— 9½"
11	11′— 3¾"
11½	11′— 9⅞"
12	12′— 4⅛"
12½	12′—10¼"
13	13′— 4½"
13½	13′—10⅝"
14	14′— 4⅞"
14½	14′—11"
15	15′— 5¼"
15½	15′—11⅜"
16	16′— 5⅝"
16½	16′—11¾"
17	17′— 6"
17½	18′— 0⅛"
18	18′— 6⅜"
18½	19′— 0½"
19	19′— 6¾"

NATCO DOUBLE SHELL FACE TILE

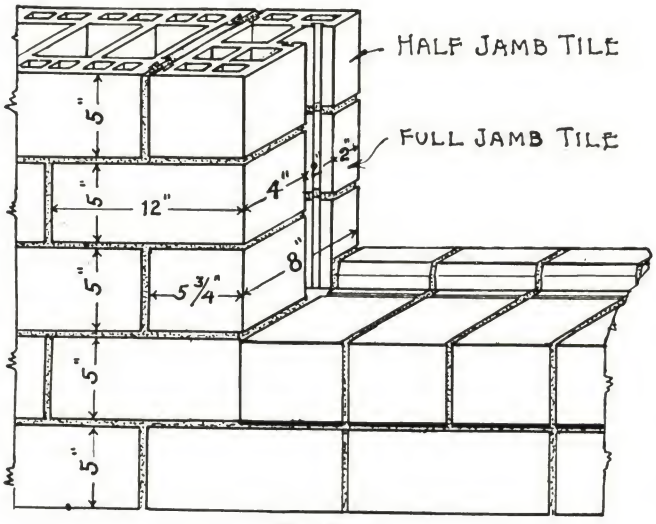


Fig. 6

Detail of opening for steel sash. Note recess in full and half steel sash jamb tile. (See Fig. 8 and 9 for method of bedding sash)

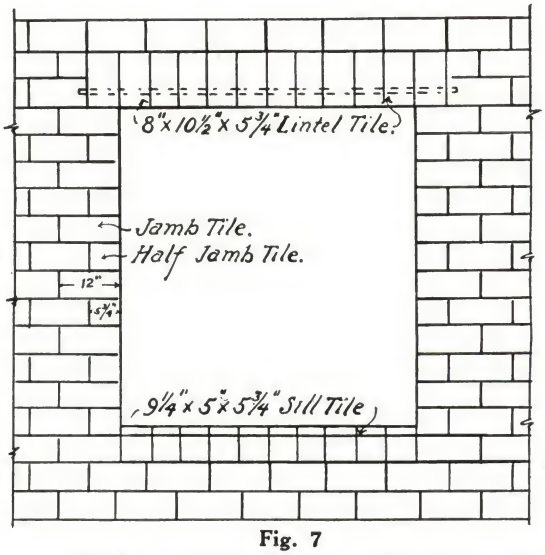


Fig. 7

Window opening showing soldier lintel. Can also be reinforced with angle iron as shown in Fig. 10

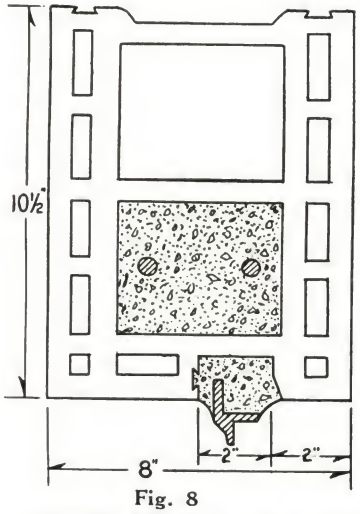


Fig. 8

Detail of lintel showing reinforced concrete beam in cell of tile and also method of bedding steel sash frame in the recess in steel sash lintel tile.

A method of reinforcing lintels over wide openings or where a heavy load bears above the openings. In order to allow the flanges of angles to go inside the tile, it is necessary to break out the small web of tile. This is very easily and safely done by tapping the web lightly with a hammer, breaking it out in small pieces until the web has been tapped out about half the length of the tile—then start at other end of tile and work to the middle

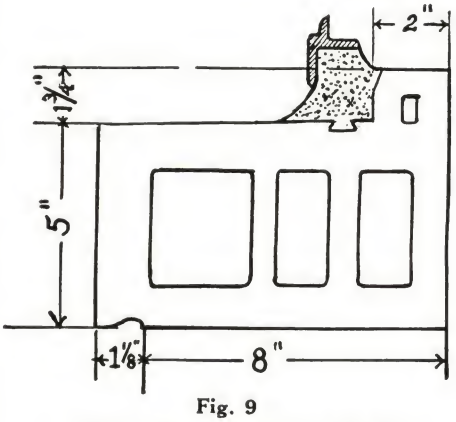


Fig. 9

Steel sash mortared to sill tile. Note dovetail scoring for holding mortar

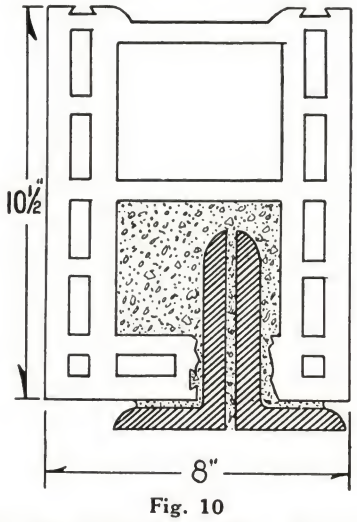


Fig. 10

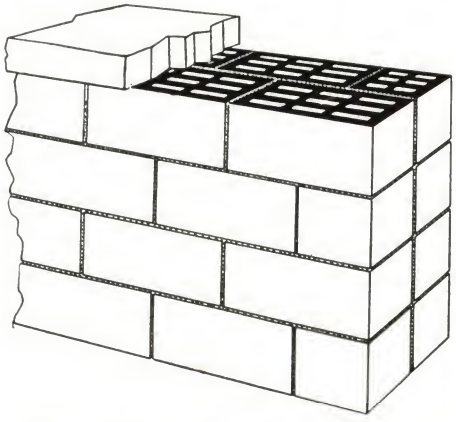
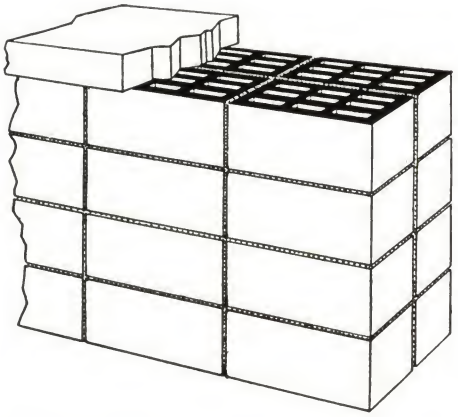


Fig. 11 (Left)

Detail of porch balustrade built of joist closures laid back to back with staggered mortar joints. This gives a finished face on each side and on the end

Fig. 12 (Right)

Detail of porch balustrade built of joist closures back to back with mortar joints in line. This gives a finished face on each side and on the end



NATCO DOUBLE SHELL FACE TILE

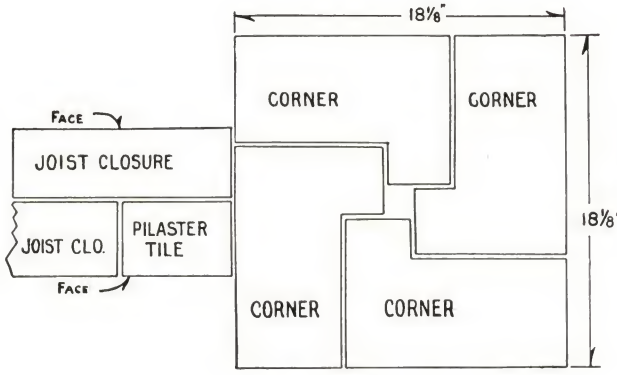


Fig. 13

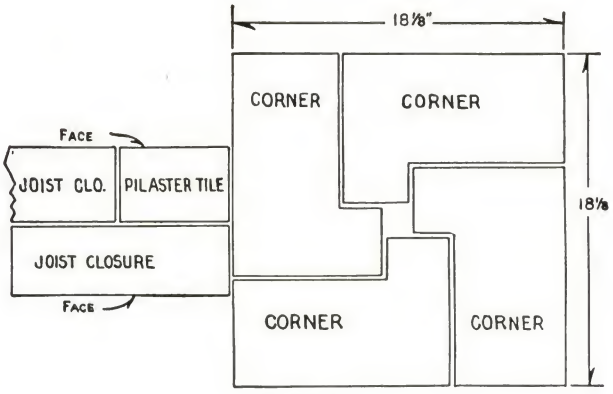


Fig. 14

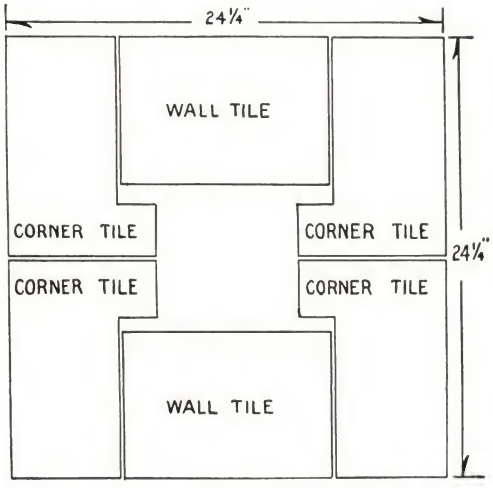


Fig. 15

PIERS

Figs. 13 and 14

Alternate courses of a porch column and balustrade. This is the smallest column that can be built with finished faces on all four sides and true bonding of tile. Both sides of balustrades have finished faces. (See Figs. 11 and 12)

Figs. 15 and 16

Details of alternate courses of a 24¼" square column. Our engineering department will gladly furnish layouts of larger size columns on request

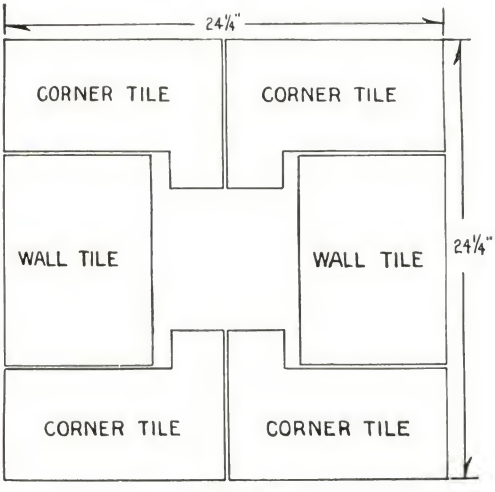


Fig. 16

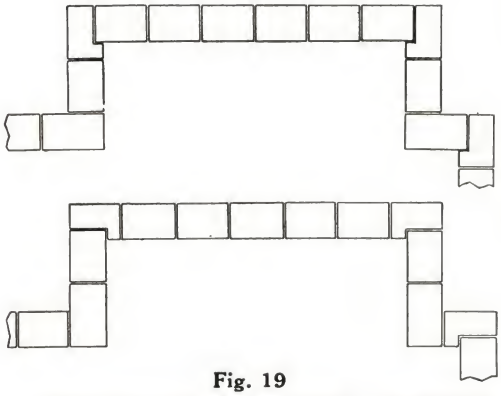
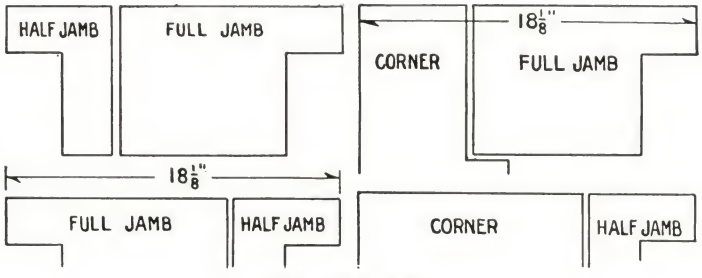


Fig. 19

Alternate courses of a typical bay window wall. Note that a true bond is preserved at all points in the wall without any cutting of tile



Figs. 17 and 18

Alternate courses showing the minimum distance between two windows, and the minimum distance from corner of building to nearest window without cutting of tile

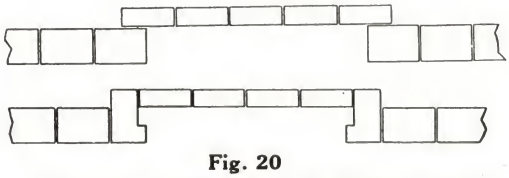


Fig. 20

Alternate courses of an 8" chimney recess. Chimney projects only 4" from face of wall

BAYS AND CHIMNEYS

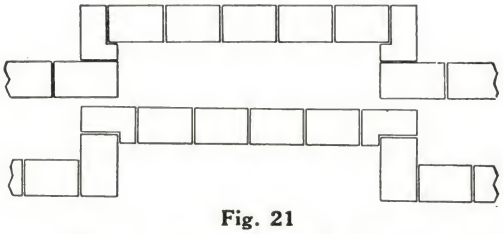


Fig. 21

Alternate courses of a 12" chimney recess. Preserves a true bond without cutting of tile. Chimney projects 12" from face of house wall. The chimney itself should be of brick

NATCO DOUBLE SHELL FACE TILE

SUGGESTIONS FOR PILASTER CONSTRUCTION

The walls of industrial and commercial buildings are often designed to be built to considerable height without cross walls, and to bear heavy concentrated loads, such as floor beams and roof trusses. In these cases it is customary to build pilasters to stiffen the wall for wind pressure, and to carry these concentrated loads. Below are shown several pilaster layouts, and our engineering department will gladly furnish others if needed. Note that all pilasters are thoroughly bonded in the wall.

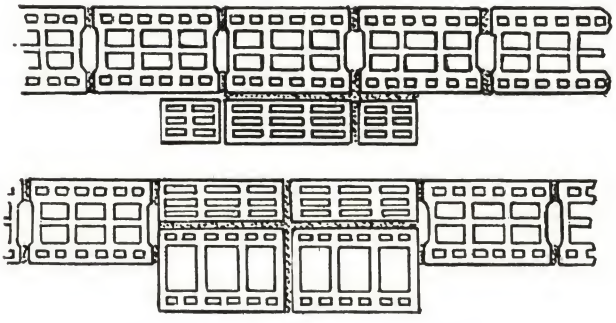


Fig. 22
Alternate courses of a pilaster 24½" wide with 4½" projection

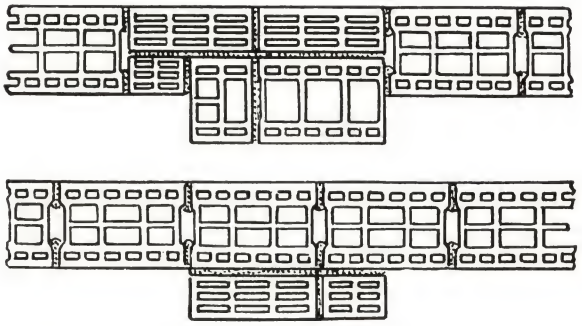


Fig. 25
Alternate courses of a pilaster 18½" wide with 4½" projection

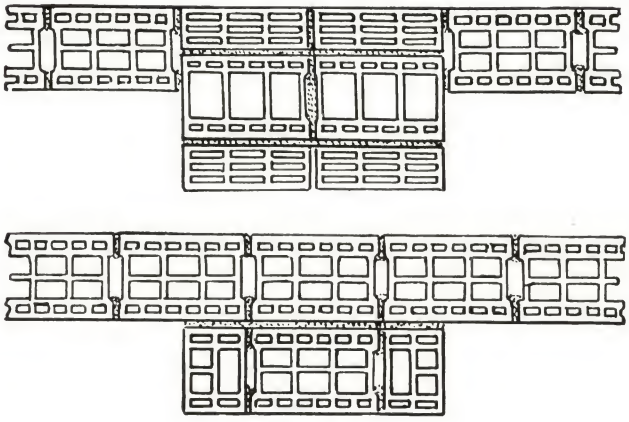


Fig. 23
Alternate courses of a pilaster 24½" wide with 8½" projection

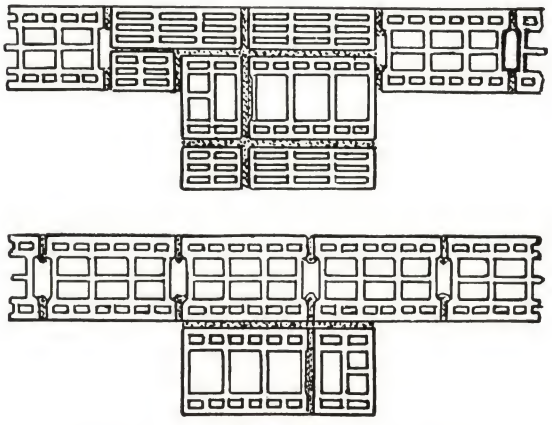


Fig. 26
Alternate courses of a pilaster 18½" wide with 8½" projection

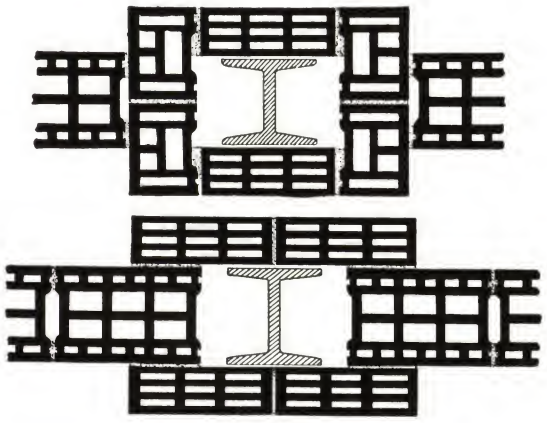


Fig. 24
Alternate courses showing method of enclosing H column. Gives a true bond. Our engineering department will gladly furnish layout for enclosing other sizes of columns

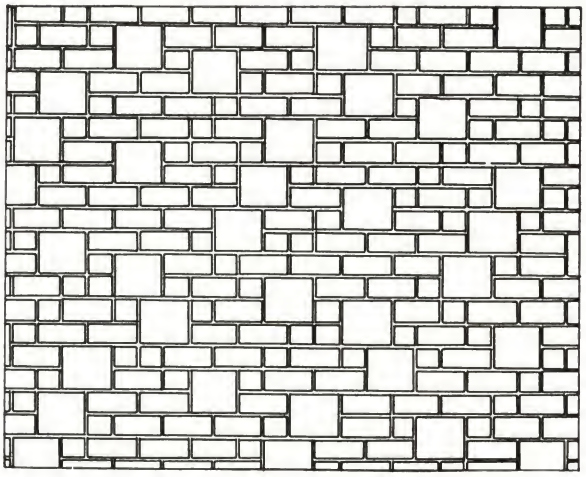


Fig. 27
Detail of a typical random bond wall obtained by the use of the T-100 Random Bond Tex Tile combined with standard Tex Tile units. This new unit permits many distinctive effects to be obtained.

NATCO DOUBLE SHELL FACE TILE

NATCO DOUBLE SHELL LOAD BEARING TILE

General

Natco Double Shell Load Bearing Tile is designed for vertical web load bearing walls to receive exterior stucco and interior plaster applied directly to the tile surfaces. The standard wall units have 12″ x 12″ dovetail scored faces and are furnished in four (4) thicknesses—6″, 8″, 10″, and 12″ to meet the various wall thickness requirements. Beside the standard wall units, complete dovetail scored complementary accessory units are furnished in each thickness for sills, jambs (for both wood and steel windows), lintels, corners, joist closures, joist bearing slabs, joist fillers, etc. to obviate cutting and fitting.

With properly staggered joints all webs are brought into vertical alignment developing maximum wall strength.

Special Feature

The outstanding feature of this tile is the double shell web construction on the two exposed faces which provides a wide, non-continuous, keyed mortar joint on both beds and ends. This non-continuous mortar joint not only permanently seals the outside face cell structure, materially increasing insulation, but most important, it positively prevents moisture passage by capillary attraction from the exterior to the interior.

Advantages

Fireproof—Furnishes the maximum in permanent fire safety.

Low Labor Cost—The completeness of the line speeds erection by obviating the usual cutting and fitting.

Maximum Insulation—The mortar sealed double shell exterior and interior face construction adds materially to insulation, comfort and economy.

Permanent Stucco and Plaster Base—The dovetail scored tile surface provides the ideal stucco and plaster base.

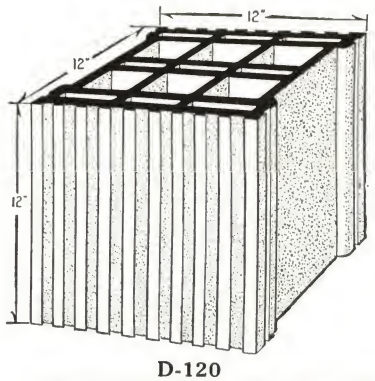
Prevents Interior Plaster Stains—The non-continuous mortar joints prevent discoloration on the interior.

Ideal for Pipe Installation—The vertical voids furnish provision for pipe chases for conduit and other piping easily accomplished without shattering the tile and with the minimum patching.

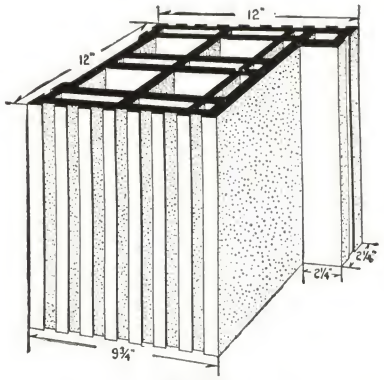
Adaptability

Specially adapted to the best class of buildings requiring stucco exteriors.

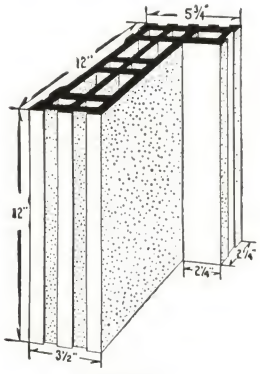
This illustration shows the method of laying Natco Double Shell Load Bearing Tile, and suggests the ease and speed with which it can be erected. In addition to its use for Stucco exterior work, Natco Double Shell Load Bearing Tile is ideal for backing up brick or stone exteriors. In such applications interior plaster may be applied directly to the interior face of the tile, the moisture-stop feature making furring unnecessary.



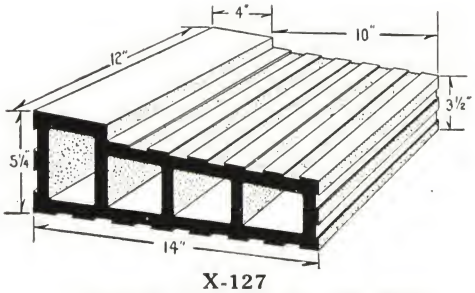
D-120
12″ x 12″ x 12″ Double Shell Wall Tile



D-123
12″ x 12″ x 12″ Double Shell Full Jamb for Box Frame Windows. (See Fig. 7)

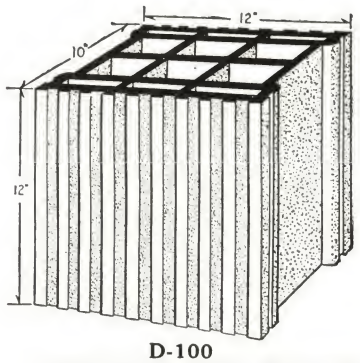


D-124
12″ x 5¾″ x 12″ Double Shell Half Jamb for Box Frame Windows. (See Fig. 7)

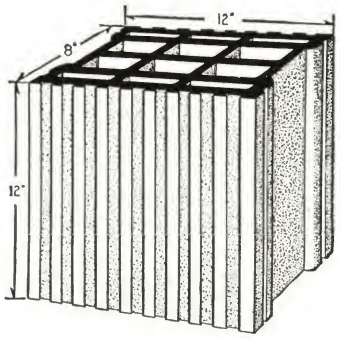


X-127
14″ x 5¼″ x 12″ Sill for 12″ Wall. (See Fig. 10)

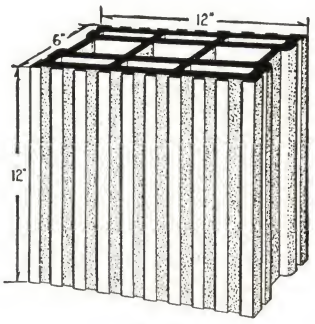
NATCO DOUBLE SHELL LOAD BEARING TILE



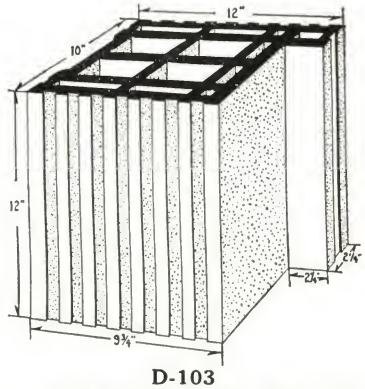
D-100
10" x 12" x 12" Double Shell Wall Tile



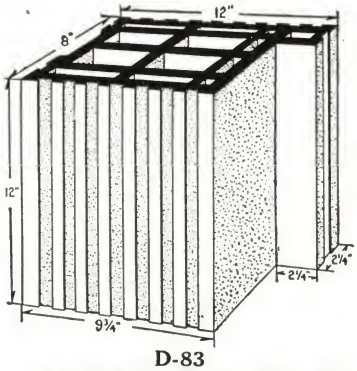
D-80
8" x 12" x 12" Double Shell Wall Tile



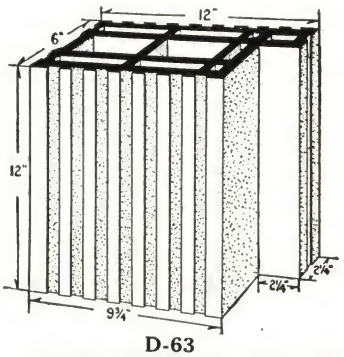
D-60
6" x 12" x 12" Double Shell Wall Tile



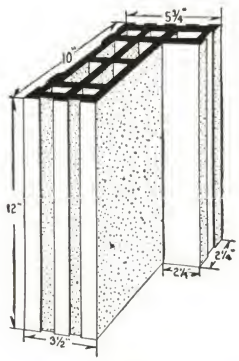
D-103
10" x 12" x 12" Double Shell Full Jamb for Box Frame Windows. (See Fig. 7)



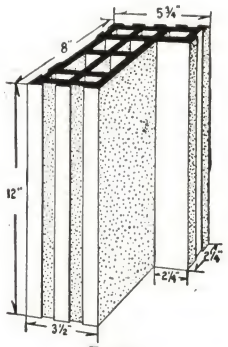
D-83
8" x 12" x 12" Double Shell Full Jamb for Box Frame Windows. (See Fig. 7)



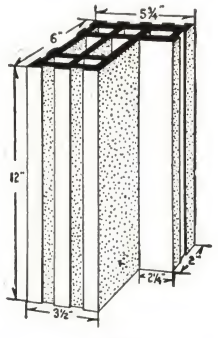
D-63
6" x 12" x 12" Double Shell Full Jamb for Box Frame Windows. (See Fig. 7)



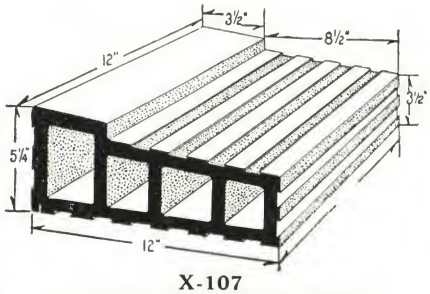
D-104
10" x 5¾" x 12" Double Shell Half Jamb for Box Frame Windows. (See Fig. 7)



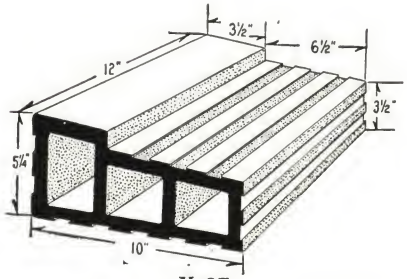
D-84
8" x 5¾" x 12" Double Shell Half Jamb for Box Frame Windows. (See Fig. 7)



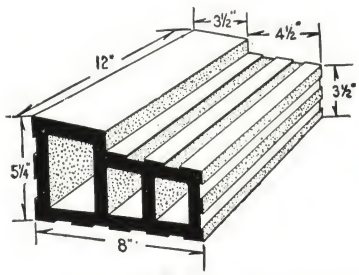
D-64
6" x 5¾" x 12" Double Shell Half Jamb for Box Frame Windows. (See Fig. 7)



X-107
12" x 5¼" x 12" Sill for 10" Wall. (See Fig. 10)

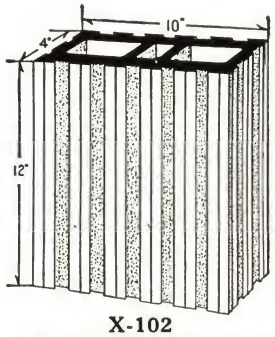


X-87
10" x 5¼" x 12" Sill for 8" Wall. (See Fig. 10)

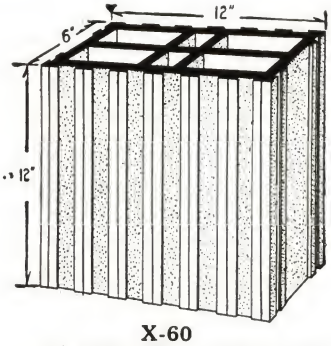


X-67
8" x 5¼" x 12" Sill for 6" Wall. (See Fig. 10)

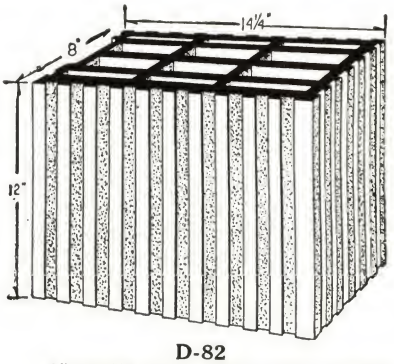
NATCO DOUBLE SHELL LOAD BEARING TILE



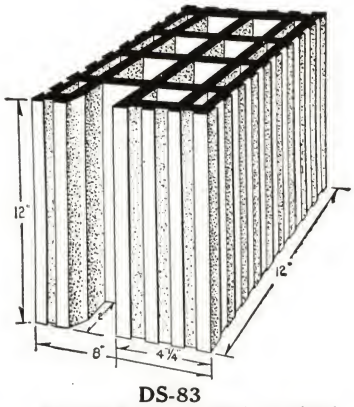
X-102
10 x 4" x 12" Corner for 10" wall. (See Fig. 5)



X-60
6" x 12" x 12" for 6" and 12" Walls. (See Figs. 3 and 6)

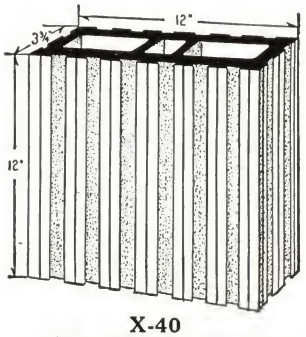


D-82
8" x 14¼" x 12" Double Shell Corner for 8" Wall. (See Fig. 4)

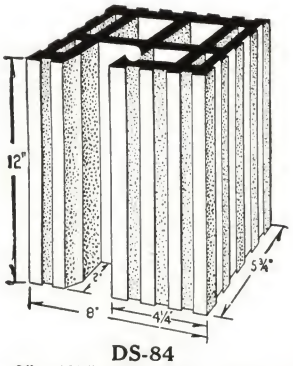


DS-83
8" x 12" x 12" Full Jamb or Lintel Tile for Steel Sash and Plank Frame Window and Doors. Recess in tile takes care of flange on steel sash or wood weather strip on box frame. This tile is also used as a Full Closure Tile

4" x 1" x 12" }
6" x 1" x 12" } **Slabs** { 8" x 1" x 12"
12" x 1" x 12"



X-40
3¾" x 12" x 12" Joist Closure also cut 10½" high for use as joist filler. (See Fig. 1)



DS-84
8" x 5¾" x 12" Half Jamb for Steel Sash and Plank Frame Windows and Doors. Recess in tile takes care of flange on steel sash or wood weather strip on box frame. This tile also used as a Half Closure Tile

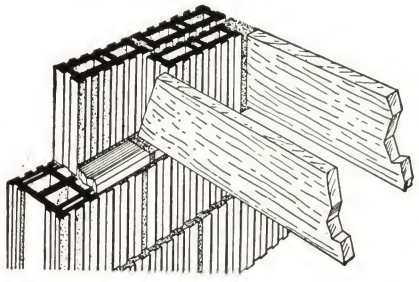


Fig. 1

Fig. 1
Shows method of building wood joists into wall. 3¾" x 12" x 12" tile are used for the exterior face of wall and by using 1" tile slabs for the joists to rest on, they get a solid and flat bearing surface and the load is evenly distributed. The space between joists is filled with 3¾" x 12" x 10½" filler tile to make a solid wall to top of joists. Joists may be spaced as desired. Illustration shows joists 14" on centers

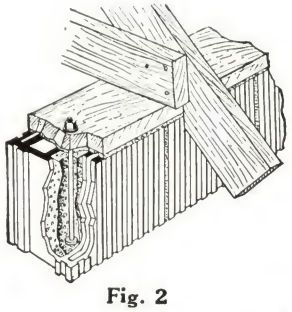


Fig. 2

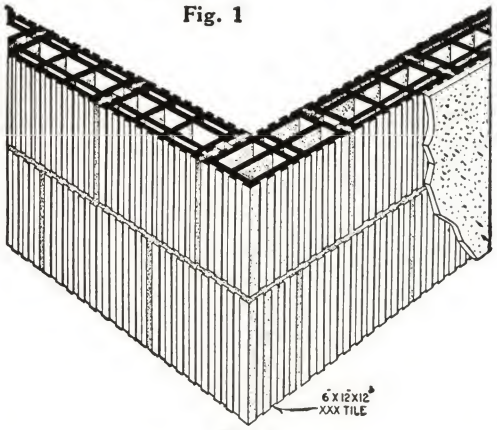


Fig. 3

Fig. 2
Bolting of roof plate to top of wall is necessary in any masonry wall to anchor roof and prevent its dislodgement due to high wind pressure

Fig. 3
Corner construction in a 6" Double Shell Load Bearing Wall

Fig. 4
Corner construction in an 8" Double Shell Load Bearing Wall

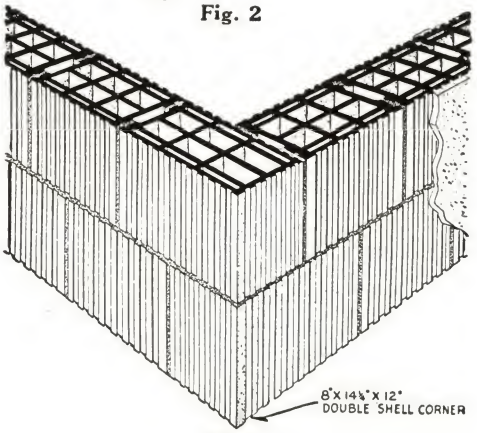


Fig. 4

NATCO DOUBLE SHELL LOAD BEARING TILE

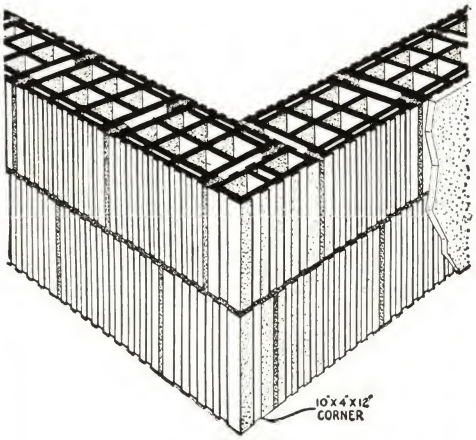


Fig. 5

Fig. 8

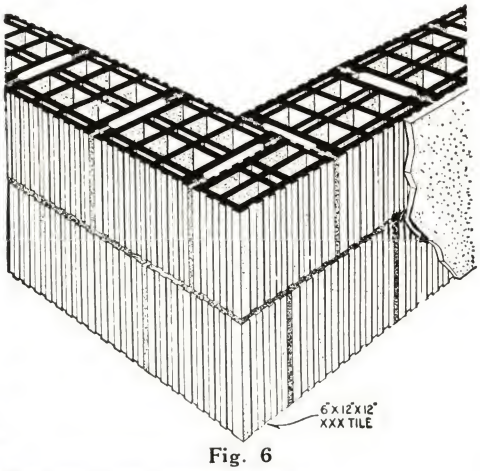


Fig. 6

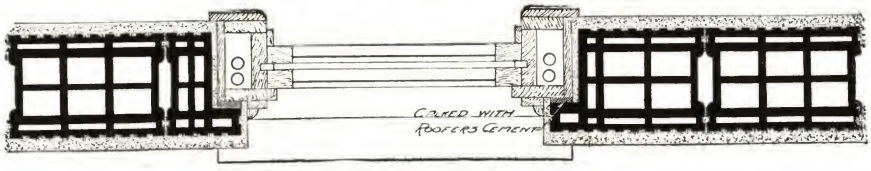


Fig. 7

Fig. 9

Fig. 5—Corner construction in a 10" Double Shell Load Bearing Wall.

Fig. 6—Corner construction in a 12" Double Shell Load Bearing Wall.

Fig. 7—Longitudinal cross section showing use of full and half jamb tile with box frame. Recess in tile provides space for sash weight box.

Fig. 8—Reinforced lintel made by placing steel rods in bottom cells of steel sash full jamb and filling cells of tile with concrete. For use with steel sash, reverse tile and construct as above.

Fig. 9—Lintel construction over wide openings, using 3¾"x12"x12" tile for wall facings and steel angles for carrying load.

Fig. 10—Section at window sill showing fitting of frame to sill and waterproofing between frame and sill with roofers' cement.

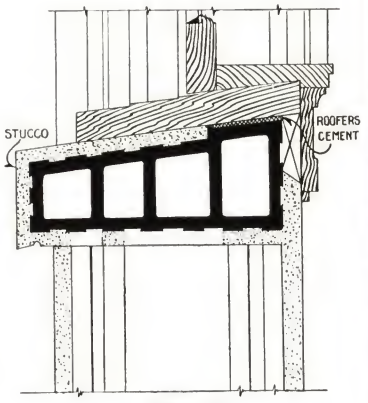
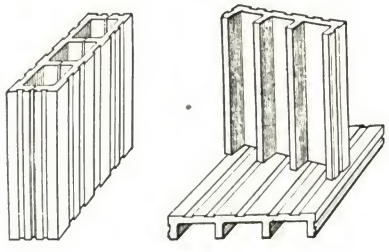


Fig. 10

NATCO DOUBLE SHELL LOAD BEARING TILE



NATCO SPLIT FURRING TILE

Brick walls exposed to the weather must be furred with hard burned tile, to prevent dampness reaching the interior and destroying the plastering and interior decorations.

The tile are made either 1½" or 2" thick and 12" square. The ribs being set against the wall, an air space is formed which effectively checks the passage of moisture. They should be set with the ribs vertical without mortar at back and fastened to the wall by driving 10d nails in the joints of the brick-work, the head of the nail being bent down upon the tile, using a nail every third tile in every second course or metal wall ties may be embedded in wall, as provided by local building codes.

Where walls must be straightened or furred out to line with face of piers the 2" tile cannot be used. If ceiling height is not too great use 3" partition tile. If the space is greater than 3" the tile may be set out from the wall leaving a clear air space behind them. They should be braced at intervals by the use of drive anchors or 4" tile can be used without the anchors. This is known as free standing furring. The face of the tile is grooved for plastering.

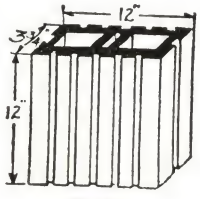
NATCO SPLIT FURRING TILE

NATCO XXX LOAD BEARING TILE

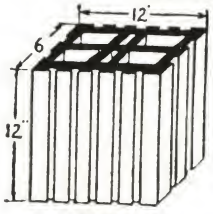
Natco XXX Load Bearing Tile is furnished for construction similar to that of Natco Double Shell Load Bearing Tile, where a lighter weight tile is required. It is extensively used in the eastern tile market.

Full and Half Jamb Tile, as illustrated below, are manufactured at our Eastern Plants *only*. For illustrations and description of Full and Half Jamb Tile as shipped from our Central and Western Plants, see details under Natco Double Shell Load Bearing Tile on preceding pages.

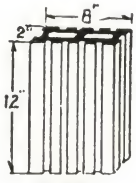
Standard Wall Tile



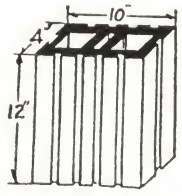
X-40
3¾"x12"x12" XXX Wall Tile



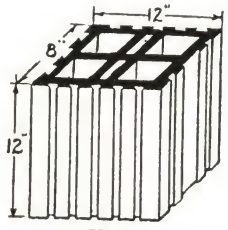
X-60
6"x12"x12" XXX Wall Tile



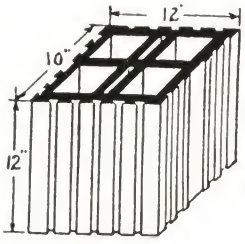
X-82
8"x2"x12" Corner for 8" wall



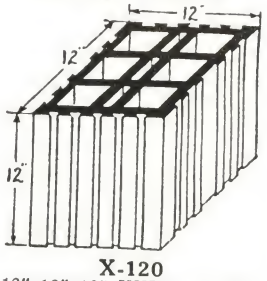
X-102
10"x4"x12" Corner for 10" wall.
See Fig. 5, page 39



X-80
8"x12"x12" XXX Wall Tile

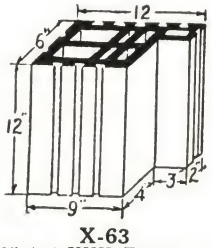


X-100
10"x12"x12" XXX Wall Tile

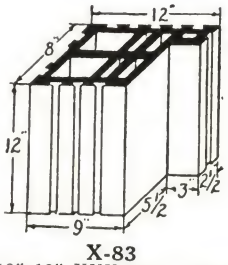


X-120
12"x12"x12" XXX Wall Tile

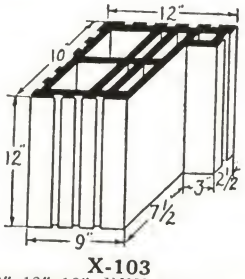
Full and Half Jamb Tile



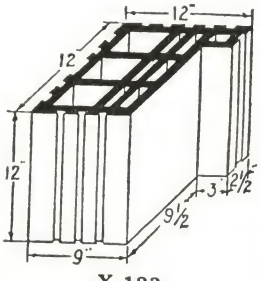
X-63
6"x12"x12" XXX Full Jamb for Box Frame Windows



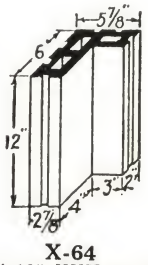
X-83
8"x12"x12" XXX Full Jamb for Box Frame Windows



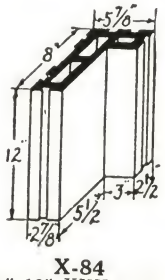
X-103
10"x12"x12" XXX Full Jamb for Box Frame Windows



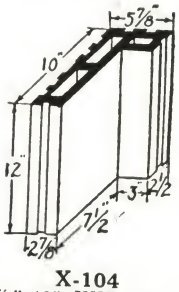
X-123
12"x12"x12" XXX Full Jamb for Box Frame Windows



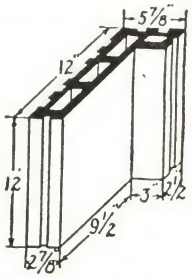
X-64
6"x5⅞"x12" XXX Half Jamb for Box Frame Windows



X-84
8"x5⅞"x12" XXX Half Jamb for Box Frame Windows

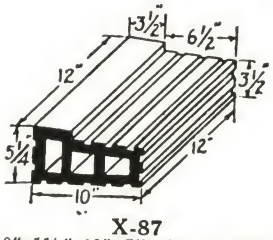


X-104
10"x5⅞"x12" XXX Half Jamb for Box Frame Windows



X-124
12"x5⅞"x12" XXX Half Jamb for Box Frame Windows

Sills



X-87
10"x5¼"x12" Sill for 8" Walls

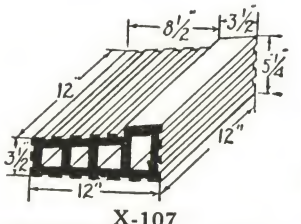
X-127
14"x5¼"x12" Sill for 12" Walls.
See page 36

X-67
8"x5¼"x12" Sill for 6" Walls
See page 37

Slabs

Eastern Plants
6"x1"x12"
8"x1"x10"
8"x1"x12"

Central and Western Plants
4"x1"x12"
6"x1"x12"
8"x1"x12"
10"x1"x12"
12"x1"x12"



X-107
12"x5¼"x12" Sill for 10" Wall

NATCO XXX LOAD BEARING TILE

NATCO HEADER BACKER

General

Natco Header Backer Tile is particularly well adapted for exterior load bearing walls faced with brick since the perfect bond every sixth brick course between brick and tile allows the full thickness of the masonry wall to be calculated for load carrying capacity.

For brick faced curtain or closure walls in steel or reinforced concrete skeleton construction, Natco Header Backer walls are ideal in point of economy. Due to a reduction of 25 per cent in dead weight over solid brick construction, savings in structural steel run into tons and foundation costs are materially reduced. It is the only tile giving a 10″ wall with an all tile backing.

Western Header Backer

The Western Header Backer is designed structurally similar to the Double Shell Load Bearing Tile and has all its advantages. (See Natco Page 36.)

Eastern Header Backer

The Eastern Header Backer is designed structurally similar to the Triple X Load Bearing Tile. The 1″ shell and web thickness fulfill New York Building Code requirements. (See Natco Page 40.)

Displacement

One (1) 8″ x 5″ x 12″ Header Tile and one (1) 8″ x 12″ x 10½″ Backer Tile including ½″ bed and vertical joints lay up 1.43 sq. ft. of wall surface; or conversely, there are required 700 Headers and 700 Backers to lay up 1000 sq. ft. of wall surface.

Backer Height

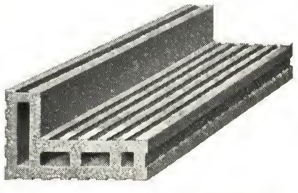
A 10½″ backer is standard and fulfills requirements in the majority of buildings. If necessary, however, the backer tile can be made of a special height to meet any ordinary brick and mortar joint condition.

Advantages

Strength—The perfect bond every sixth course of face brick gives maximum load bearing strength for wall thickness.

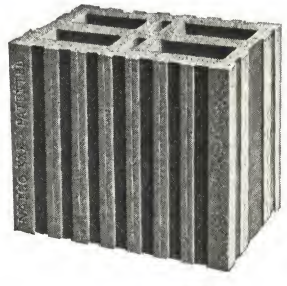
Lightness—Approximately 25 per cent lighter than solid brick masonry walls of equal thickness. The 10″ and 14″ thicknesses are not obtainable in solid brick masonry.

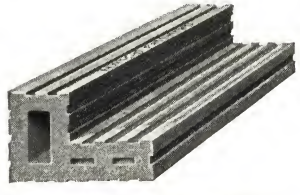
Insulation—The cellular tile structure promotes insulation comfort and economy.



Western Header Backer

Note that the backer tile is similar to Natco Double Shell Load Bearing Tile except in height which is 10½″ instead of 12″. (See Natco Page 36.) Header tile matches the backer tile in web construction



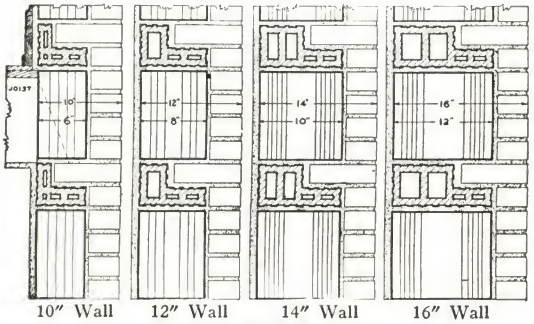


Eastern Header Backer

Note that the backer tile is similar to Natco Triple X Load Bearing Tile except in height which is 10½″ instead of 12″. (See Natco Page 40.) Header tile matches the backer tile in web construction

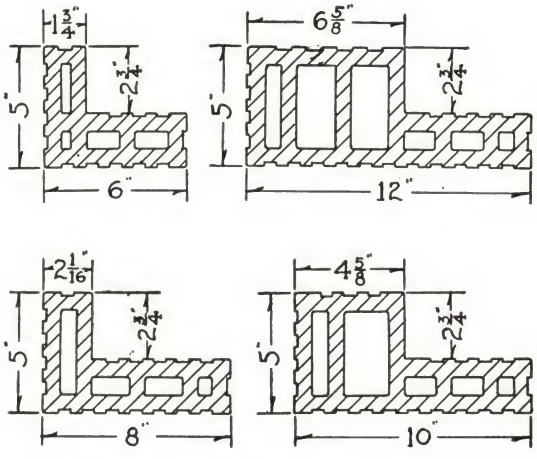
Adaptability

The strong, light Natco Header Backer construction is particularly adapted to use in all brick faced buildings, whether of load bearing or curtain closure wall construction, where the maximum in good construction and economy in labor costs are appreciated.



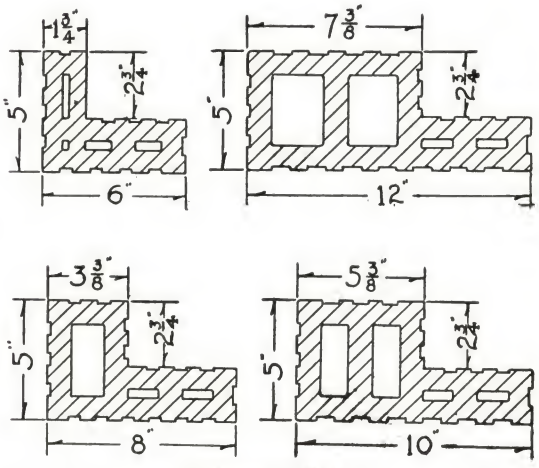
Typical Wall Sections

The standard backer is 10½″ high. While these sections show walls, including brick facing, 10, 12, 14 and 16″ only, thicker walls may easily be obtained by using additional tile



Western Header

The web design matches that of the double shell Western backer tile



Eastern Header

The web design matches that of the Eastern backer tile with 1″ web thickness

NATCO HEADER BACKER

NATCO UNIBACKER

General

Natco Unibacker is a load bearing unit used in brick faced load bearing or curtain closure walls. It provides a mechanical bond every sixth brick course of such strength that full bearing value is allowed on the full masonry wall thickness.

Natco Unibacker can be bonded satisfactorily with Column Covering as three courses of the Unibacker will bond into two courses of the Column Covering.

The Eastern Unibacker is designed with 1" thick shell and webs particularly for the New York market.

Full bearing is provided for floor joists in load bearing walls.

The standard tile is dovetail scored for interior plaster.

Smooth Face Tile

If unplastered smooth tile walls are desired, unscored tile can be manufactured on special order. Adequate notice must obviously be given through our nearest branch office.

Economy of the Single Unit

Unibacker is made in a single tile shape and size which permits great speed of erection and consequent labor economies. This is particularly apparent in long curtain walls without openings.

Its weight, compared with solid brick masonry, materially reduces foundation and steel costs without sacrifice of strength and permanence.

Unibacker is particularly economical of mortar. It saves approximately one-third over ordinary tile construction.

Displacement

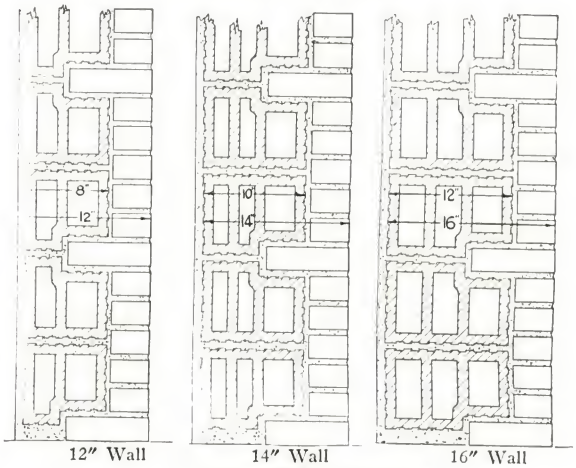
Each Unibacker unit replaces (according to thickness) from 6 to 12 brick, which accounts for the pronounced savings in erection costs and the greater erection speed.

The inner face is 12" x 7¾". Standard thicknesses are 6", 8", 10" and 12" for 10", 12", 14" and 16" walls. Each tile lays up .715 sq. ft. of wall surface when ½" mortar joints are used. 140 units lay up 100 sq. ft. of wall.

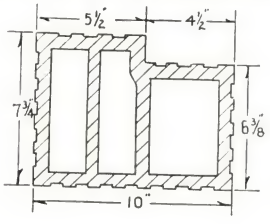
Natco Unibacker Construction (Eastern Type)
Note the strong, effective masonry bond between the Unibacker tile and brick facing

Adaptability

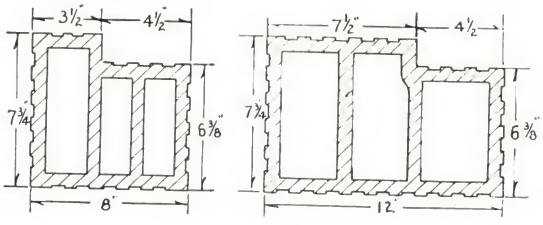
A strong, light construction with speed and labor economies adapting it admirably to use in all types of brick faced buildings of either load bearing or skeleton curtain wall construction.

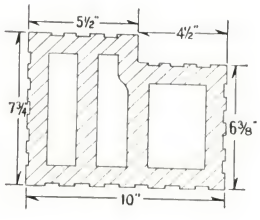


Typical Wall Sections
While these sections show walls including brick facing, 12", 14" and 16" only, 10" walls may be built by the use of the 6" Unibacker tile. Walls thicker than 16" may easily be obtained by using additional tile

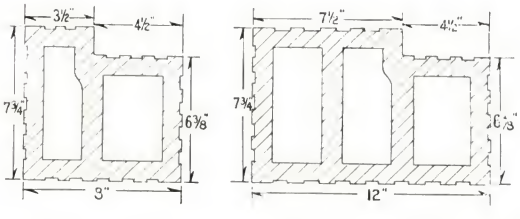


Western Unibacker
Due to the type of clay used the thinner shell and web construction adequately fulfills all load bearing requirements
Note: *A 6" Unibacker (not illustrated) is also available.*





Eastern Unibacker
This tile is particularly designed for the New York market where 1" thick shell and webs are required



NATCO UNIBACKER

NATCO INTERLOCKER TILE

General

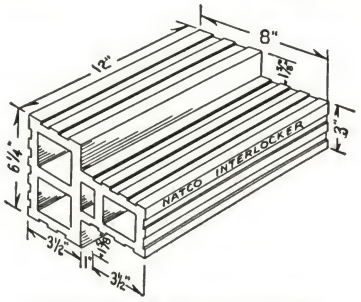
Natco Interlocker Tile is used for load bearing and closure walls, either in combination with brick or stucco, or without facing.

The units are light enough to be handled with one hand—are laid quickly and easily—effect a considerable saving in mortar and labor cost.

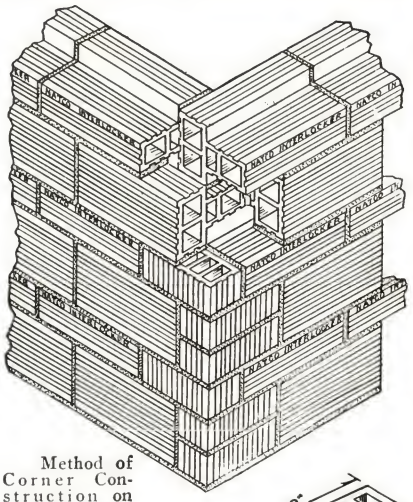
Mechanically bonded Interlocker walls may be built to any thickness desired. The vertical webs are always aligned, assuring maximum strength. Dead air spaces bar heat and cold, and the non-continuous mortar joints prevent the passage of moisture. Plaster is applied directly to the interior surface without furring.

Natco Interlocker provides economical, fire-proof, strong, permanent construction.

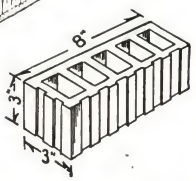
All structural details may be worked out as easily as the ones illustrated on this page. Information on specific construction problems will be gladly furnished.



Dimensions of Natco Interlocker

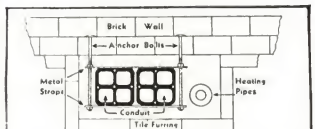

Method of Corner Construction on 8" Walls

Right: Dimensions of Closure Block. One face and one end are scored—other face and end smooth



NATCO INTERLOCKER TILE

Some of the typical shapes, and a few of the varied applications, of Natco Clay Conduit —the *permanent* protection for cables.



Natco Clay Conduit in Walls of Telephone and Telegraph Buildings for Riser Cables

Socket-Joint Single Duct (for laterals). 3½" and 4¼" Rd. Bore. 18" and 24" long.

Single Duct —3¼", 3½" and 4¼" Round bore —18" long.

Single Duct —3¼", 3½" and 4¼" Square Bore —18" long

2 - way — 3¼", 3½", 4¼" bore— 24" long

3 - way — 3¼", 3½", 4¼" bore— 24" long.

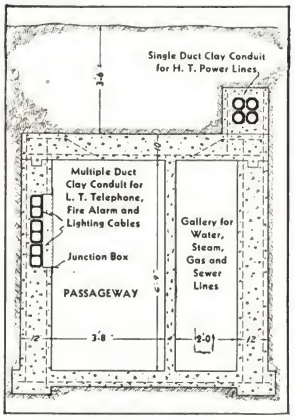
4 - way — 3¼", 3½", 4¼" bore— 36" long.

6 - way — 3¼", 3½", 4¼" bore— 36" long

Mitered Conduit 3°—10' Radius (for curve Const.) 3¼", 3½" and 4¼" bore—Approx. length 6"x6¾"; 2, 3 and 6-way, edge or flat position; 4 and 9-way

Branch Conduit (for dividing conduit line) 3¼", 3½" and 4¼" bore— 24" long; 2, 3, 4 and 9 way for 2 branches; 3 and 6-way for 3 branches, 6-way for 2 branches (2 or 3-way)

Natco Clay Conduit in the U. S. Capitol

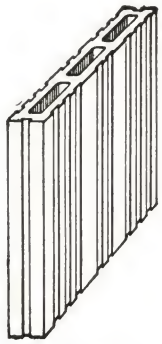


Natco Clay Conduit in Walls or Ceiling of a Typical Service Tunnel

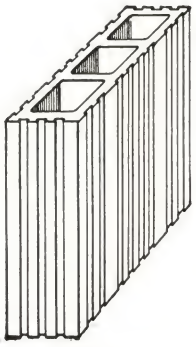
Natco Clay Conduit for Power and Lighting Cables Under Floors of an Industrial Shop Building

NATCO CLAY CONDUIT

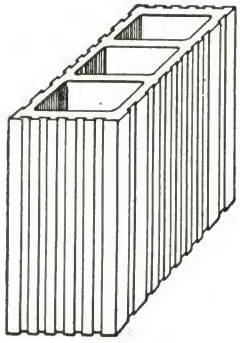
NATCO PARTITION TILE



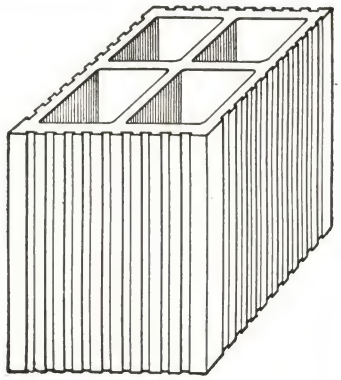
2 inch
Eastern Factories
2-cell—2x8x12—10 lb.
Ohio Factories
3-cell—2x12x12—15 lb.
Western Factories
3-cell—2x12x12—15 lb.



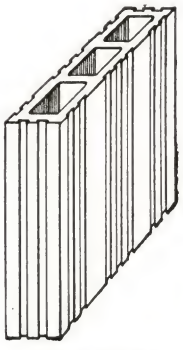
4x12x12
Eastern Factories
3-cell—16 lb.
Ohio Factories
3-cell—16 lb.
Western Factories
3-cell—16 lb.



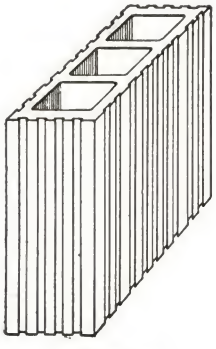
6x12x12
Eastern Factories
4 and 6 cell—22 and 24 lb.
Ohio Factories
3-cell—22 lb.
Western Factories
3-cell—22 lb.



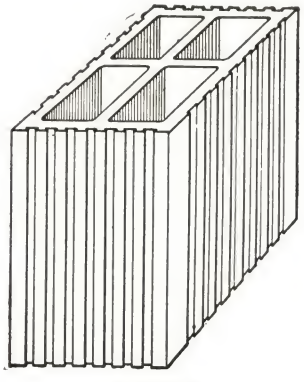
10x12x12
Eastern Factories
6-cell—36 lb.
Ohio Factories
4-cell—36 lb.
Western Factories
6-cell—36 lb.



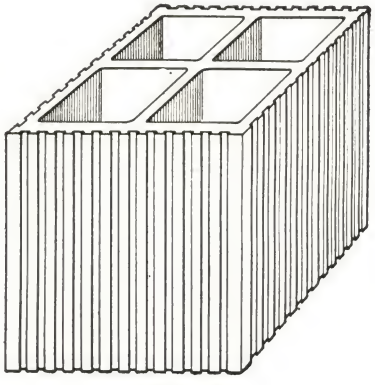
3x12x12
Eastern Factories
3-cell—15 lb.
Ohio Factories
3-cell—15 lb.
Western Factories
3-cell—15 lb.



5x12x12
Eastern Factories
6-cell—22 lb.
Ohio Factories
3-cell—19 lb.
Western Factories
3-cell—19 lb.



8x12x12
Eastern Factories
6-cell—30 lb.
Ohio Factories
4-cell—30 lb.
Western Factories
6-cell—30-lb.



12x12x12
Eastern Factories
6-cell—40 lb.
Ohio Factories
4-cell—40 lb.
Western Factories
6-cell—40 lb.

Note: Additional shapes available at Ohio factories: 5x12x12—6 cell—26 lb., 6x12x12—6 cell—28 lb., 7x12x12—3 cell—25 lb., 7x12x12—6 cell—30 lb., 8x12x12—6 cell—32 lb., 9x12x12—4 cell—32 lb.

In addition to their fire-resisting qualities, structural clay tile partitions are light, strong, easily handled by bricklayers, and do not transmit heat, cold or sound.

All partitions and furring tile, unless otherwise specified, are scored to receive plaster.

Wood or channel iron bucks are placed in all door openings, and should be 1½″ wider than thickness of the tile and act as grounds for the plastering.

It is not generally practicable to use 2″ tile for partitions, except for closets, shafts, etc.

Partitions of 3″ can be safely used up to 12′ in height, 4″ to 16′ and 6″ to 20′.

The tile are commonly made 12″ wide by 12″ long, except 2″ tile at Eastern and Northeastern factories, which is made 12″ long but 8″ wide at Eastern factories and 6″ wide at the Northeastern factory. They can be made any size required, but special sizes are necessarily more expensive.

In office buildings it is good practice to have all elevator enclosures of 6″, all main corridors and stairway enclosures of 4″ and the partitions between rooms 3″. Partitions should be bonded where meeting and anchored to wood bucks or brick walls by using 10d nails, or metal wall ties, in each second joint.

Natco Smooth Partition Tile (Glazed or Unglazed)

At a slightly increased cost, Natco Partition Tile, either glazed or unglazed, is made smooth on either one or two faces, as desired. The smooth, sanitary, easily cleaned interior surfaces of the tile walls, make it very desirable for warehouses, industrial plants, elevator shafts and similar applications.

Glazed or unglazed backing up tile, with smooth face, can also be furnished to be used in combination with smooth partition tile.

Standard thicknesses of this material are 4″, 6″ and 8″. Other sizes of smooth partition tile will be manufactured if sufficient quantities are ordered.

Standard glazed or unglazed partition tile, with one or two faces smooth, are always furnished with one end smooth so that tile can be used as a closure or lintel in addition to its use as wall tile.

NATCO PARTITION TILE

NATCOFLOR

Description

Natcoflor System is a combination of special shaped Natco tile with 2″ wide cement grout joists or ribs spaced 13″ center to center between the tile. Each rib is reinforced with two steel bars, one straight and one bent.

No concrete is required on top of the tile for structural purposes. Wooden sleepers are placed directly on the tile, and are held in place with cinder fill or sleeper clips.

The design of the tile is such as to place the maximum sectional area of the tile unit where it will be of the most use in resisting the compressive stresses. The dead weight of the tile thus has been kept down to the minimum. In other forms of "Combination" systems, these stresses are taken care of by the concrete top. The tile are made from special clay which gives them high compression strength. Tests have repeatedly and clearly demonstrated that tile may be safely figured to take compressive stresses of 1000 pounds per sq. in. of net sectional area, allowing an ample factor of safety.

Cement grout or mortar mixed one part cement to two and one-half parts sand is used for the 2″ joists. This thoroughly covers the steel reinforcing and completely fills the joints between the tile. (At girders, etc. where the open ends of the tile are exposed, the tile are first placed on end and the cells stopped with about 1″ of mortar.) The flanges of the tile meet at the bottom to form an all tile ceiling thus assuring an excellent base for plastering.

With Natcoflor, greater speed of erection at a much lower cost is secured. This is due to the perfect alignment of the tile, small amount of material required for reinforcing joists and the extremely light dead load as compared with other strictly fireproof floors.

Our engineers will be glad to give architects and designers any assistance required in using this construction.

Special Features

Saves Dead Load—In either steel or concrete frame and foundation.

Saves Floor Depth—2″ to 4″ less than other construction.

Saves Plastering—No metal lath or suspended ceiling. A continuous tile surface.

Saves Labor Cost—Permits speedy erection the year around.

Saves Insurance—Strictly fireproof construction.

Typical Specification for Natcoflor

Fireproofing—The floor construction shall be what is known as "Natcoflor" system which consists of special structural clay with flanges at the bottom forming a tile ceiling, and 2″ wide mortar joists 13″ on center between the tile. Each joist shall be reinforced with 2 steel bars at the bottom, one to be bent and one straight. The bent bars shall extend up and continue over the point of support, where possible to the ¼ point of the adjacent span. No concrete or mortar is required on top of the tile for structural purposes.

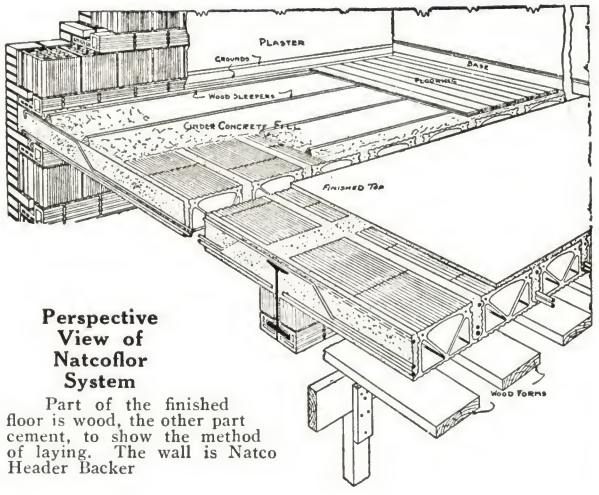
Tile—The size of the tile shall be as called for on the plans. The sizes given are the depth of the tile. All tile shall be of hard burned fire clay, free from damaging impurities and large defects and properly scored on all exterior surfaces. Actual weight of the tile shall not vary more than 5% over or under weight for different sizes published by the NATIONAL FIREPROOFING CORPORATION. Tile shall be placed end to end in straight rows with bottom flanges and ends as tight as possible together. Break joints in alternate rows of tile by the use of half tile. Tile used at ends of rows shall be placed on ends and stopped with a small quantity of mortar. Rows of tile should line up from span to span. All tile must be wet before pouring mortar to insure a good bond.

Steel Reinforcing—Bars shall be of a deformed type meeting the specification of the A.S.T.M., and of sizes shown on drawings. Before placing into position, bars must be clean and free from rust or scale, adhering material, oil or any other substance tending to destroy the bonding qualities.

Cement—American portland cement to conform to the A.S.T.M. specifications.

Sand—Sand shall consist of quartz grains or other hard material, clean and free from any surface film coating and graded from fine to coarse. Shall not contain injurious vegetable or other organic matter or more than 5% by volume of clay or loam.

Mortar—Mortar for 2″ joist between the tile shall be mushy grout, not too wet, and shall consist of 1 part by volume of cement and 2½ parts sand and shall be mixed in a batch mixer. Mortar shall be dumped on top of tile and swept into place in joists between tile, so that all joists and joints are properly filled. Mortar shall be puddled so that steel reinforcement is completely encased in mortar.



Perspective View of Natcoflor System

Part of the finished floor is wood, the other part cement, to show the method of laying. The wall is Natco Header Backer

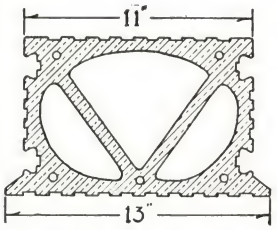
Conduits

When cement or terrazzo floors are used, a run for conduit may be easily made by putting in a series of tile less in depth than the rest of the floor. In the case of wood floors, the conduit may be run between the sleepers.

Negative Moment and Shear Tile

Our corporation is able to furnish a special Natcoflor tile for use adjacent to the supporting members to take care of any excessive negative moment or shear at these points. This tile is so designed that the compressive area at lower portion of the tile is the same as the area in the upper portion besides having the additional key for the grout at the bottom. Generally two or three pieces of this special tile are required adjacent to the supporting member, depending on the designer's requirements. In some cases they would not be needed.

The advantages of this tile are that in some cases a saving in depth and cost of floor may be obtained. For example, a floor must sometimes be increased in depth because of excessive shear or negative moment although it meets the other design requirements. The tile weighs little more than the ordinary Natcoflor and the dead weight of the floor as a whole is not affected.



Negative Moment and Shear Tile

NATCOFLOR SYSTEM OF FIREPROOF FLOORS

NATCO FLAT ARCH FLOORS

General

Flat arches as adapted to floors and roofs are made up of various shaped tile as shown on Natco Page 48. The tile resting against the beams are called "skews" and the protection for the beam known as the "soffit" tile is held in place by the bevel on the "skews." The intermediate tile are called "inters" and the center one the "key."

Natco Flat Arch in general comes under two divisions, namely, the "End Construction Flat Arch" and the "Combination Side and End Construction Flat Arch" each described and illustrated below.

The depth of the arch must be proportioned to the span between the beams and to a certain extent to the load carried. A safe general rule for finding the depth of the arch in inches is to multiply the span in feet by 1½" and add the thickness of the protection below the beams. This is the code requirement of the larger cities in general.

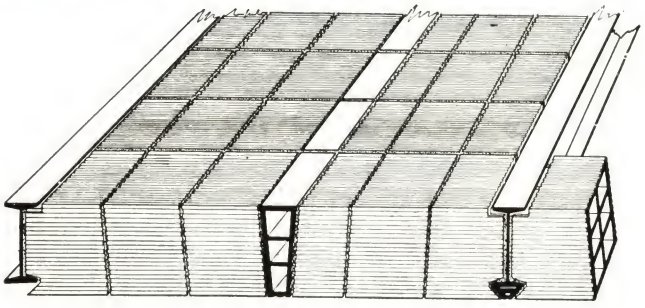
The outstanding advantage of the flat arch is its adaptability to speed in construction independent of temperature. Centers need remain in place but one-tenth to one-fourth as long as required under concrete construction. Moisture due to cement hydration is minimized.

Flat arch is most economical. Although the arch itself is placed by bricklayers, this labor cost is more than offset by the low centering cost. Centering is hung. (See Natco Page 47.) There is little or no lumber loss—no nails are used. Floors beneath are accessible for work by other trades.

By the omission of tile units at the time of erection, pipe work of the mechanical trades is economically accommodated. Holes may be cut at any time, almost with impunity, and later easily patched.

The all-tile ceiling provides the most satisfactory surface for plastering.

Natco End Construction Flat Arch

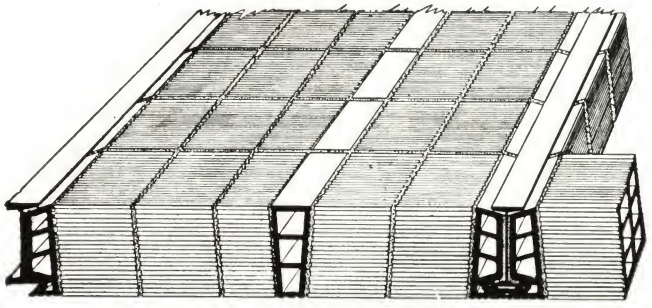


Typical End Construction Arch

Natco End Construction Flat Arch consists of end construction skews and inters and side construction keys.

This arch is the most adaptable form of arch, since the end construction skew can be cut to fit different elevations and sizes of the beams. Of course, it is advisable to keep the bearing beams as near the same elevation as possible so that the same skew which is usually cut to allow a 1½" or 2" soffit of tile under the beams may be used throughout and make for uniformity and, therefore, economy of construction. Moreover, this gives a more uniform ceiling level.

Natco Combination Side and End Construction Flat Arch



Typical Combination Side and End Construction Arch

Natco Combination Side and End Construction Flat Arch consists of side construction skews and keys and end construction inters.

By reversing the direction of the cells in the skews, better protection is given to the sides of the beams by the mortar joints and by the shells of the skews. The inters must be set end to end in straight courses from skew to key. The typical section illustrates the method of assembling the various members of this arch.

Side construction skews, being made by die to fit the various size standard beams, cannot be changed, as can end construction skews. If it is desired to use side construction skews uniformly throughout a building, the bearing beams must be on the same level at the bottom and of sufficient depth to permit the top of the skew to go under the top flange of the beam. Of course, special conditions can be taken care of by using end construction skews at these points and cutting them to fit.

Designing Data

The following table is applicable to all shapes of tile. Generally speaking, hollow tile of various shapes but of the same depth and cross-sectional area, have equal strength, and therefore, the strengths of arches of equal depth are directly proportional to their net sectional areas. The depth of arch as given in the table includes the protection underneath the bottom of the beam or the thickness of the soffit tile.

The strength of any arch depends as largely upon the workmanship as upon the material. The spans given in the table are safe if the arches are properly set, but may not agree with the requirements of the Building Codes of various cities.

Safe Loads given in the table have been figured for the Natco Combination Arch of side construction skews and keys with end construction inters. The net sectional areas of tile indicated, are for the keys—the critical point of the arch—and are taken per foot of tile parallel to beams.

Weights of arches have *not* been deducted from safe loads in the table; this and other dead load must be deducted to obtain the net safe live load for any arch and span.

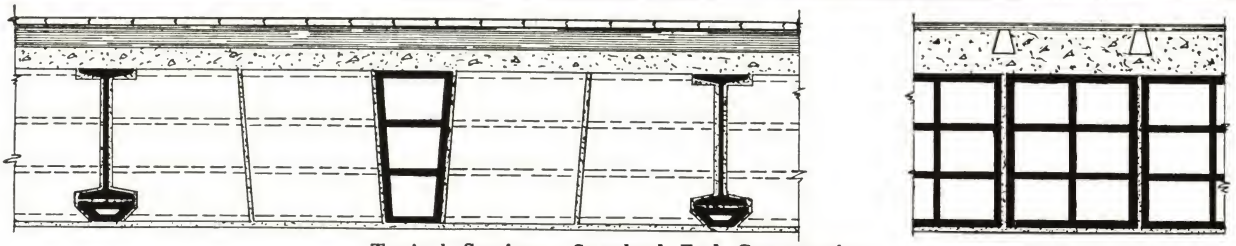
TABLE OF SAFE LOADS PER SQ. FT. (DEAD AND LIVE)

Factor of Safety of 7

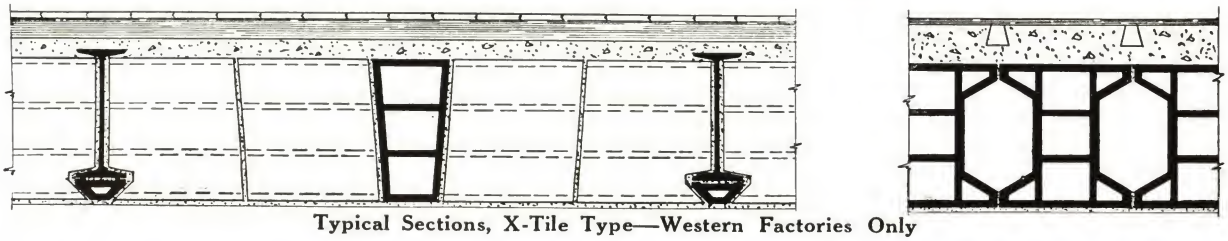
Arches	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.	15 in.
Net sectional areas	27 sq. in.	27 sq. in.	27 sq. in.	27 sq. in.	36 sq. in.	36 sq. in.	36 sq. in.
Average wt. per sq. ft.	26 lb.	30 lb.	32 lb.	36 lb.	40 lb.	48 lb.	56 lb.
Span—ft. and in.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
3–0	420	490	560	630	933	1120	1400
3–3	357	417	477	537	795	954	1193
3–6	308	360	411	462	685	823	1028
3–9	268	313	358	403	597	716	895
4–0	236	276	315	354	525	630	786
4–3	.....	244	279	314	465	558	697
4–6	.....	218	249	279	415	497	622
4–9	.....	.....	223	251	372	447	558
5–0	.....	.....	201	227	336	402	504
5–3	.....	.....	182	205	305	365	457
5–6	.....	.....	.....	187	277	333	417
5–9	.....	.....	.....	171	254	305	381
6–0	.....	.....	.....	157	233	280	350
6–3	.....	.....	.....	.....	214	258	322
6–6	.....	.....	.....	.....	198	238	298
6–9	.....	.....	.....	.....	.....	221	276
7–0	.....	.....	.....	.....	.....	206	257
7–6	.....	.....	.....	.....	.....	178	223
8–0	.....	.....	.....	.....	.....	157	197
8–6	.....	.....	.....	.....	.....	.....	174
9–0	.....	.....	.....	.....	.....	.....	155
9–6	.....	.....	.....	.....	.....	.....	140
10–0	.....	.....	.....	.....	.....	.....	126

Engineering Service

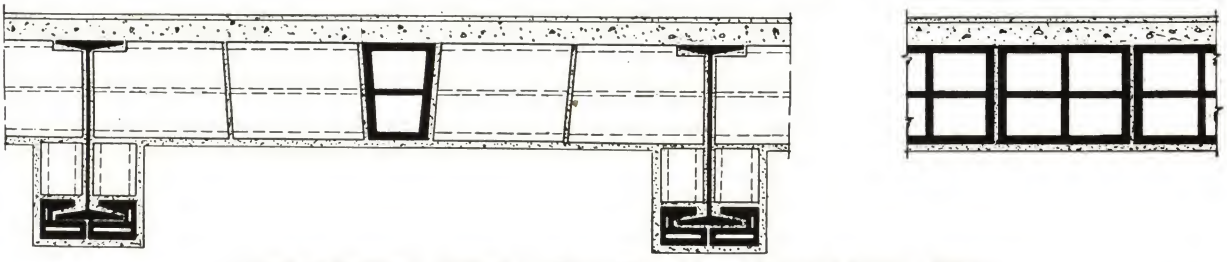
It is part of NATIONAL FIREPROOFING CORPORATION'S service to design the arches for each individual span and furnish schedules and sketches showing the pieces which should be used in each size of span, and to make skews which will fit the structural steel work.



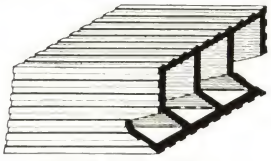
Typical Sections—Standard End Construction



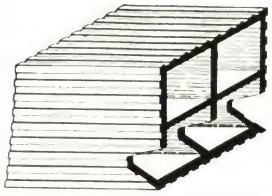
Typical Sections, X-Tile Type—Western Factories Only



Typical Sections—Raised on Floor Beams for a Paneled Ceiling Effect



For 6″ and 7″ Floors

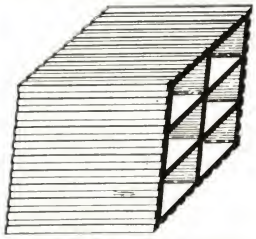


For 8″, 9″, 10″ and 12″ Floors

For 13″, 14″ and 15″ Floors

Bottom Cut End Construction Skews

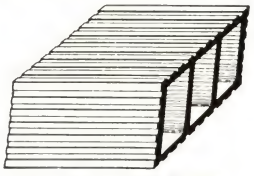
(*Note:* The 12″ length measured at center of arch is standard)



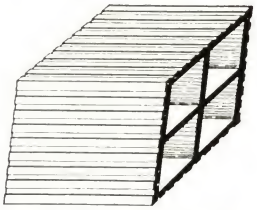
For 13″, 14″ and 15″ Floors

Inters

(*Note:* Furnished in 8″ and 12″ lengths)



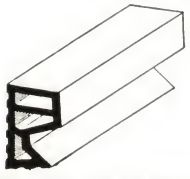
For 6″ and 7″ Floors



For 8″, 9″, 10″ and 12″ Floors

Typical Units of Natco Flat Arch

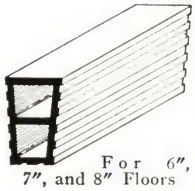
For 9″, 10″, 12″, 13″, 14″ and 15″ Floors



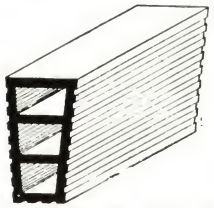
For 6″, 7″ and 8″ Floors

Soffit

(Furnished in 1½″ 2″ thicknesses in widths to suit flange of beam)



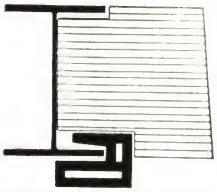
For 6″, 7″, and 8″ Floors



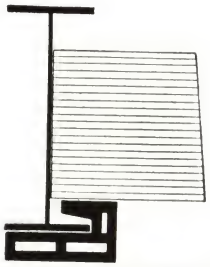
For 9″, 10″, 12″, 13″, 14″ and 15″ Floors

Side Construction Skews

(*Note:* 4½″ in thickness at centerline of arch. These skews can be furnished only for standard flange beams)



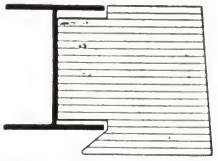
End construction skew, cut to suit clip tile and flange of beam



Shows bearing of end construction butt skew on spandrel beam

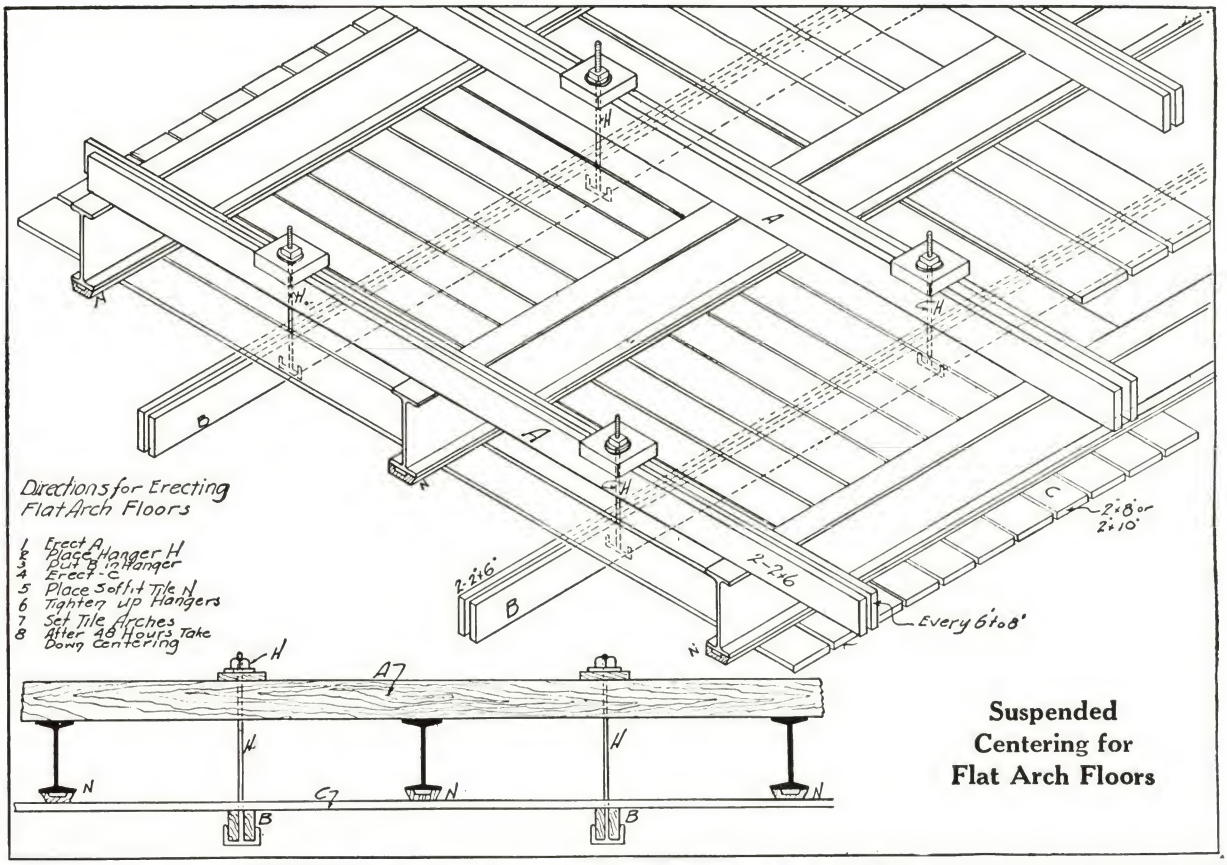
Keys

(Furnished in 3″, 4″, 5″ and 6″ thicknesses measured at the center line of arch)



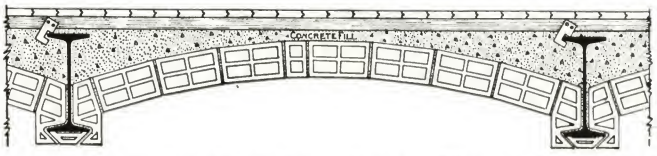
End construction skew cut at top and bottom for wide flange beam

NATCO FLAT ARCH FLOORS



Suspended Centering for Flat Arch Floors

NATCO SEGMENTAL ARCH FLOOR



This form of arch combines great strength with economy and lightness. It is particularly adaptable to warehouses, lofts, factories, sidewalks, or wherever a flat ceiling is not necessary.

The 6" arch is most commonly used and weighs approximately 35 lb. per sq. ft.

End construction tile may be used, but they are unsatisfactory unless the arches are of uniform span and rise throughout. Where a very light, strong arch is required in deep beams, and a flat ceiling is also demanded, use a suspended ceiling below the beam.

The most effective location for the tie rods to counteract the thrust is near the bottom of the beams. They may be placed there and painted, or set higher and protected by the arch. If this is done the rods in the end spans should be made forked or double rods set crossing each other.

Complete engineering data on application.

NATCO BOOK TILE

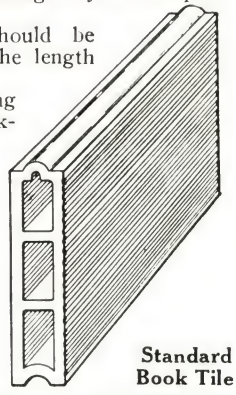
On account of their shape these tile are called "Book Tile," and they are made especially for roofs to be covered with concrete, tar and felt or any composition roofing. They are made of uniformly hard-burned material 3" thick, and of a length depending very much upon the weight to be carried.

The steel framework T's should be spaced 1" wider on centers than the length of the tile.

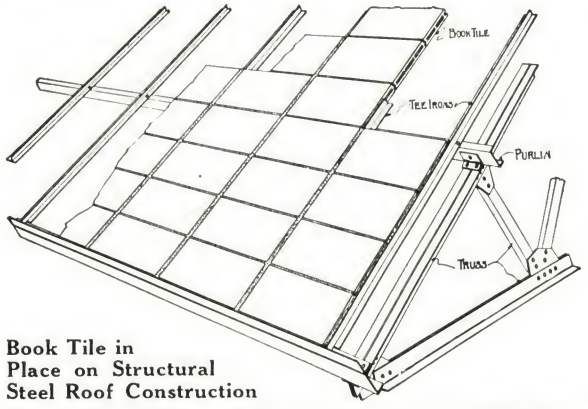
Book tile are used for covering the flat roofs of penthouses, bulkheads, etc., and may be used for main flat roof of a building when only light live loads are anticipated.

When providing for future increase in height of a building, a floor of flat arches is set and roof grading placed on temporary supports of T's (or dwarf-walls), and book tile.

Natco Book Tile permits a minimum of condensation of moisture underneath due to its high insulating qualities. This makes it invaluable for the protection of manufacturing processes, such as glass making, etc., where the product might be injured by the drip of water, or the spalling of underside of roof slab.



Standard Book Tile



Book Tile in Place on Structural Steel Roof Construction

NATCO COMBINATION LONG SPAN FLOORS

Natco One Way System

The Natco Combination One Way System is particularly adapted to all classes of buildings where long span fireproof floors are required without the beams showing in the ceilings. The Natco Structural Tile in combination with the load bearing concrete reduces the dead load and provides a good plastering surface. The tile make permanent forms in which are cast the series of connected concrete "T's."

The tile in a line of units are all in contact, and hold each other securely in the proper positions. They are not displaced in pouring the concrete, and no realignment is necessary.

The naturally strong adhesive bond between tile and concrete, aided by the mechanical bond of the dovetail scorings on the tile, produce a monolithic effect.

In these floors, the Natco Structural Tile fireproofs the load carrying concrete of the beams against the flames of a fire below. Without this protection, a fire is likely to cause spalling, rapid weakening of the floor, and ultimate failure.

Special Two Way System Tile

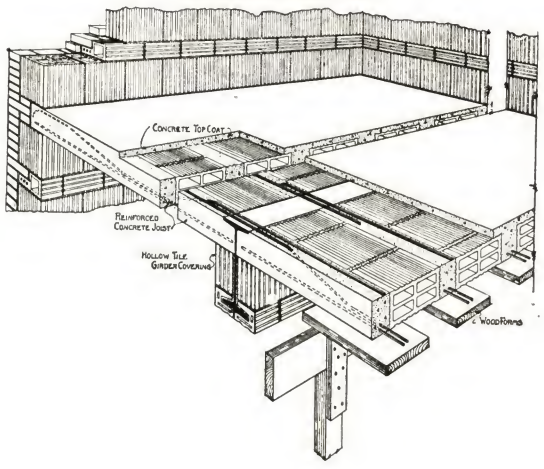
Besides our regular one way system of combination floor we are able to furnish a special tile adaptable for a two way system of combination floor.

This special Natco tile is a hollow tile block *with no exterior openings,* which prevents the concrete from entering the cells as would be the case if ordinary floor tile were used.

The design of the two way system is similar to the one way, the joists running in two directions at right angles instead of one which distributes the load in two directions. This floor has the advantages of decreasing the depth of slab, eliminating deep spandrel beams, and giving a very rigid floor laterally. No additional cross-bracing is required, which is a very important consideration in tall buildings subjected to high wind stresses.

Perspective View of Typical One Way Combination Floor

Note economical wood centering used; 2x8″ or 2x10″ under each joist is sufficient



TILE DEPTH AND STEEL AREA REQUIRED, ONE WAY COMBINATION FLOOR SLABS, 2″ CONCRETE TOP, JOISTS 4″ WIDE, 16″ ON CENTERS

fc.=650 lb. per sq. in.
fs.=16,000 lb. per sq. in. $\frac{Ec}{Es}=\frac{1}{15}$
Shear, 60 lb. per sq. in.

¾″ of concrete below reinforcement.

T=Tile; S=Steel.

*If moment $\frac{WL}{12}$ is used, investigate design for shear.

Total safe load (dead plus live), pounds per square foot		150		165		180		195		210		225		240		260		300		335		375		450	
	Continuous Span $M=\frac{WL^*}{12}$																								
	Semi-continuous span $M=\frac{WL}{10}$	125		135		150		160		175		185		200		220		250		280		310		375	
	Simple span $M=\frac{WL}{8}$	100		110		120		130		140		150		160		175		200		225		250		300	
Span in feet		T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S
6																									
7												3	.20	3	.22	3	.24	3	.28	4	.24	4	.27	5	.27
8		3	.19	3	.20	3	.22	3	.24	3	.26	3	.28	3	.30	4	.26	4	.30	5	.27	5	.30	6	.31
9		3	.24	3	.26	3	.29	3	.31	3	.34	3	.36	4	.31	4	.34	5	.32	5	.36	6	.34	7	.35
10		3	.31	3	.33	3	.37	3	.40	4	.34	4	.36	4	.39	5	.35	5	.40	6	.38	7	.37	8	.40
11		3	.38	3	.41	3	.46	4	.39	4	.42	4	.45	5	.40	5	.44	6	.42	7	.41	8	.41	9	.44
12		3	.46	4	.39	4	.44	4	.47	5	.42	5	.45	5	.48	6	.45	7	.45	7	.50	8	.49	10	.48
13		4	.43	4	.47	4	.52	5	.46	5	.50	5	.53	6	.49	6	.54	7	.53	8	.53	10	.47	12	.48
14		4	.51	4	.55	5	.50	5	.54	5	.59	6	.53	6	.57	7	.55	8	.55	9	.55	10	.56	12	.57
15		4	.59	5	.53	5	.58	5	.63	6	.58	6	.61	7	.58	7	.64	8	.64	10	.58	12	.54	15	.53
16		5	.56	5	.61	5	.67	6	.61	6	.67	7	.61	7	.66	8	.65	9	.66	10	.67	12	.63	15	.61
17		5	.64	5	.69	6	.65	6	.70	7	.66	7	.70	8	.67	9	.66	10	.68	12	.64	12	.71	15	.70
18		6	.61	6	.67	6	.74	7	.68	7	.75	8	.70	8	.76	9	.75	10	.77	12	.73	15	.65	...	...
19		6	.69	6	.75	6	.82	7	.77	8	.74	8	.78	9	.76	10	.76	12	.73	12	.81	15	.73	...	...
20		6	.76	6	.83	7	.80	7	.86	8	.83	9	.78	9	.85	10	.85	12	.81	15	.73	15	.81	...	...
21		7	.74	7	.80	7	.89	8	.84	8	.91	9	.87	10	.85	12	.79	12	.90	15	.81	15	.90	...	...
22		7	.81	7	.89	8	.87	8	.93	9	.91	9	.96	10	.94	12	.87	15	.80	15	.90	...	...	...	...
23		7	.89	8	.86	8	.95	9	.91	9	.99	10	.95	12	.87	12	.95	15	.88	15	.98	...	...	...	...
24		8	.86	8	.93	8	1.03	9	.98	10	.98	10	1.03	12	.94	12	1.03	15	.95	...	...	...	...	...	...
25		8	.94	8	1.02	9	1.01	9	1.08	10	1.07	12	.96	12	1.03	15	.92	15	1.05	...	...	...	...	...	...
		8	1.02	9	1.00	9	1.10	10	1.07	12	.98	12	1.03	12	1.12	15	1.00	15	1.13	...	...	...	...	...	...

Note: Based on safe loads indicated, the thickness (inches) and the areas of reinforcement (square inches per joist) are the figures for average conditions, and are for general information only. Each particular operation should be designed in accordance with actual conditions.

The Natco Engineering Department is at the disposal of any one desiring further information.

Weight of Combination Slabs Per Square Foot

Tile, in.	3	4	5	6	7	8	9	10	12	15
Weight, lb.	45	50	55	60	65	70	75	80	90	105

Note: Load tables for general information only, as each particular operation should be designed in accordance with actual conditions.

NATCO COMBINATION LONG SPAN FLOORS

NATCO GIRDER AND COLUMN COVERING

The purpose of beam, girder and column covering is to place a retardent to fire over the structural steel frame of buildings, and to provide a surface on which to plaster. This goes under the general name of "Fireproofing of Steel."

Natco Fireproofing Is Reliable

It is necessary that the steel columns and the girders and beams projecting below the floor slab, be protected by at least 2″ of fireproofing material. Experience has proven that well-burned hollow tile (burned at temperature of about 2000° F.) has no equal as a covering for structural steel or iron. In case of a serious fire, the integrity of the whole structure depends upon the thorough protection of the columns and girders and floor beams, and no reasonable expense should be spared to accomplish this.

Natco Fireproofing Satisfies All Conditions

There is a shape of Natco Girder Covering to fit in with almost any condition of fireproofing which may be required. The lower flanges of rolled beams and girders of any size have a Natco Clip or Shoe Tile to fit them. Plate girders, double beams and riveted sections are protected by means of a hung soffit and angle tile (see Figs. 4 and 8). The sides of the beams are protected by proper thickness filler tile at heights designed to fit neatly the opening between top of clip or angle tile and floor slab or top flange of beam. (See illustrations.)

If heavy plaster cornices are used, the girders are protected first by the hollow tile, and the shape required for the plastering is obtained by iron brackets and metal lath. This latter, alone, is not sufficient protection.

Natco Fireproofing Saves Dead Load

Tile covering saves from 50 to 75% in weight over concrete or brick covering. Even on a small 12″ I-beam the saving is 50% in weight; in the large girders it is much greater. (See Fig. 9.)

Natco Fireproofing Saves in Cost

Tile fireproofing can, in general, be put in place complete for close to the same price as it costs to erect box forms about the beams for the concrete. In addition, you have the cost of steel beam wrapper and of the concrete itself to add to form cost; therefore, a saving of approximately 25 to 50% in cost, over concrete covering, can be made by use of tile.

Natco Fireproofing Promotes Speed of Erection

No forms being needed to hold the tile in place, there is, of course, no period of waiting for concrete to set before shores and forms can be removed.

Natco Fireproofing Provides Best Plastering Surface

One of the greatest advantages of tile beam and girder and column covering is the excellent plastering surface which is given to receive this finish.

No other surface is more economical of plaster, nor has a better mechanical key or more capillary suction than has tile. The absorption of moisture is small and test shows that the tile and plaster become almost one body. Only two coats of plaster are needed on tile.

Where steel columns are to be stiffened with concrete or where concrete columns are to be finished with plaster, the forms for same may be built out of partition tile or column covering. The tile must be banded with steel wire or strap iron, and mortar must be allowed to set, however, before the concrete is poured so that there will be sufficient strength in the wall to take care of the side pressure of the wet concrete.

Natco Fireproofing Will Carry the Load Safely

Tile girder covering has always been used with flat arch construction of floors, but present day contractors are finding a great saving in its use with all forms of concrete and long span type of floors. Where the span is long and where there is a considerable load on the floor joists, it is customary to use tile filler with the cells vertical, so that concrete can run into them and give a continuous solid bearing of the concrete joints on the lower flange of the beam. (See Figs. 6 and 7.) Even horizontal fillers are amply strong enough to carry the total load of the ordinary floor safely and well within the allowance for tile walls under building codes.

Natco Fireproofing Lowers Insurance Rates

Due to the tendency of the time to lighten up in the construction of floors in order to effect saving in steel, there has come into recent use a great variety of floors of thin built-up sheet metal joists, of built-up joists of bars, and light weight structural beams with a thin slab of top concrete. These floors depend for fireproofing merely on a ceiling of plaster on metal lath.

It is self-evident that if the supporting steel beams are not protected by something other than these ceilings, fire breaking through a portion of the ceiling will get to the structural beams and the entire floor or structure will fail. Such supporting beams should be fireproofed entirely up to the underside of the concrete floor slab on top of the joists, in which case the floor slab might fail, but the structure will be intact. (See Fig. 10.)

Buildings constructed of heavy slow burning timbers and floors on a steel frame can be made much more secure and obtain a much better insurance rate if the beams and columns be encased in tile.

Natco Fireproofing a Barrier Against Corrosion

No better protection can be found for structural steel against corrosion than tile masonry with good cement mortar filling space between tile and steel. Exterior steel members should, therefore, be built in solidly with tile masonry.

Natco Fireproofing Service

The standard shapes entering into the construction of Natco Beam and Girder Covering are carried in stock at all times. Regardless of the size of the job, shipments can be started promptly and kept up as needed, provided, of course, that proper notice is given of the extent and nature of the requirements so that the factories can be scheduled to take care of them.

It is not necessary for the architect or contractor, when designing for or estimating on the use of Natco Hollow Tile Beam and Girder Covering, to worry about the sizes and shapes of the tile clips and filler which must be used on the various size beams.

It is part of the service provided by the National Fireproofing Corporation to furnish with each order for this material, a set of schedules for the architect's approval and the contractor's use, designating just what will be furnished for each beam shown on the final steel erection plans. This material is all sold on a basis of the square footage of the actual outside surface of the tile surrounding the beam from bottom of floor on one side of beam to the bottom of floor on the other side.

Estimates can be made of the approximate amount of this tile by taking the linear distance in feet around (A + B + C) as shown in Fig. 1 or (A + B + C + D) as shown in Fig. 2, and multiplying this sum by the length of the beam in feet.

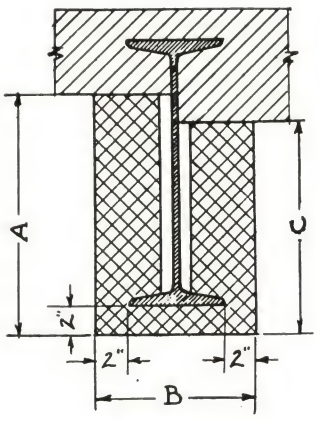


Fig. 1

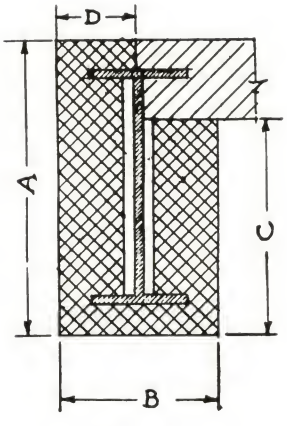
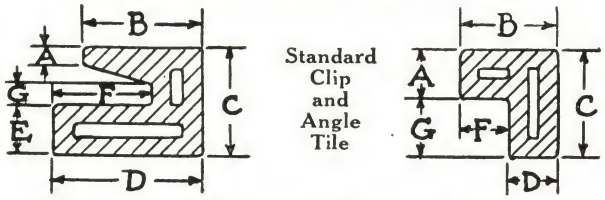


Fig. 2

After order is placed, a full set of the architectural drawings and a set of the final structural steel erection plans, as made up by the structural steel fabricator, should be forwarded to the National Fireproofing Corporation as soon as possible, so that design can be made and submitted for approval at earliest date possible.

NATCO GIRDER COVERING



Note: Clips and angles are 12″ long. A percentage of halves is shipped with each order.

Die No.	Approx. Sq. ft. outside measure	Approx. Weight per piece	A	B	C	D	E	F	G
G20	.65	13	¾	3⅜	3¾	3¾	2	2	¾
G25	.70	14	¾	3⅞	4	4½	2	2½	1⅜
G30	.75	15	⅞	4¼	4¼	4¾	2	3	⅞
G35	.80	16	¾	4¾	4¼	5½	2	3½	1
G40	.85	17	¾	4¾	4¼	6	2	4	1
G45	.90	18	¾	4¾	4¼	6½	2	4½	1
G46	.95	19	¾	4¾	4¾	6⅝	2	4⅝	1½
G50	.95	19	¾	4¾	4¼	7	2	5	1
G55	1.00	20	¾	4¾	4½	7½	2	5½	1¼
G60	1.05	21	1	5½	4⅝	8	2	6	1⅜
G61	1.05	21	1	4½	4⅝	8	2	6	1⅜
G70	1.16	23	1	6	4⅞	9	2	7	1½
G71	1.16	23	1	4½	4⅞	9	2	7	1½
G75	1.33	29	2	7½	6⅜	9½	2	7½	2⅜
G80	1.40	32	2	8	6⅞	10	2	8	2⅞
L23	.60	12	2	4	5	2	.....	2	3
L26	.90	18	2	4	8½	2	.....	2	6½
L43	.65	13	2	6	5	2	.....	4	3
L46	.95	19	2	6	8½	2	.....	4	6½

How to Select and Order Proper Clip Tile for Beams

(1) Obtain the width of the beam flange, either by field measurement, or from manufacturer's handbook.

(2) Select in the above table the clip tile, having the "F" dimensions nearest to ½ the width of the flange.

(3) Order two pieces of clip tile for each linear foot of beams when the flange is covered on both sides.

Example—Beam having a flange width of 6¼″ will require a G-30, since ½ of 6¼″ is 3⅛″; and G-30 has "F" dimensions equal to 3″.

For some of the especially thick flanged beams, it is well to check the "G" dimension of the tile with the thickness of the nose of the flange of the beam.

Angle tile should be selected so that the "G" and "F" legs are long enough to cover the special condition for which it is needed.

Handling at the Job

In handling at the job, it is well to instruct your labor foreman that when a G-20 Clip is called for, the "F" or jaw dimension is two inches, a G-25 is 2½″, etc. on down the list. Similarly an L-23 is 2″ at the "F" and 3″ at the "G" dimension, etc. for all of the angles, except that the "G" dimension for the L-26 and L-46 angles is 6½″.

Caution: When material is received at the job, it is essential that all sizes of Clip, Angle and Filler Tile be piled in separate groups. If this be done, the handling of the shapes from pile to bricklayer will be greatly expedited.

Special Thickness of Fireproofing to Fulfill Ordinance Requirements

Where ordinances depart from the generally accepted standards nationally established, the NATIONAL FIREPROOFING CORPORATION in all cases provides Girder and Column covering of thickness and design that fulfill the ordinance requirements in that particular locality or district. In such cases special details, comparable to those illustrated under this heading, have been prepared and are accessible at the branch office serving the locality.

Our representatives are thoroughly familiar with all local building ordinance requirements pertaining to fire proofing within their respective territories—their advice and suggestions are always promptly available.

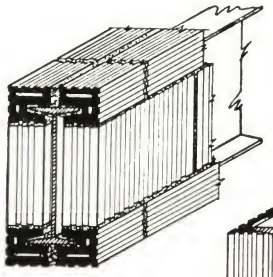


Fig. 3
Shows method of entirely enclosing a strut or beam which is in no way protected by the floor or other masonry

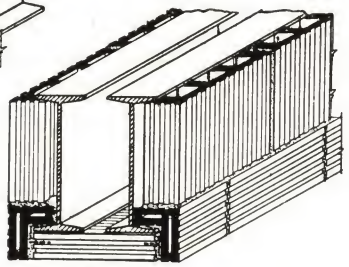


Fig. 4
Double beams, if not too far apart, may be protected on the bottom by long shoe or clip tile, however, if it be over 14″ from the outside of flange on one beam to the outside of flange on the other beam, a 3″ soffit tile is hung on metal hangers, which the contractor may make of No. 16 gauge or heavier strap iron. An angle tile is mortared over the end of this and after the mortar has set, the hanger serves as a reinforcement for the corner

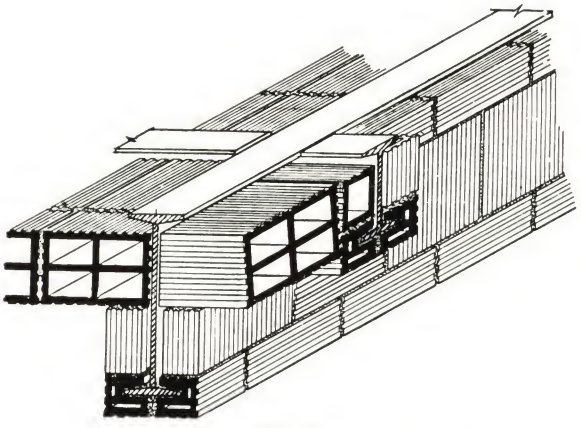


Fig. 5
Illustrates conditions of covering in flat arch work. Note especially covering where the arch is parallel to shoe on small beams and the full side covering at opening in floor

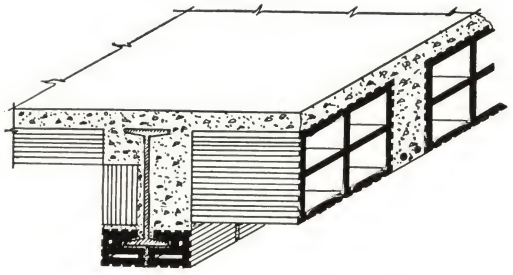


Fig. 6
Shows method of using tile fireproofing with long span concrete joist floor construction. It is economical either with structural tile or metal pan filler in the floor. You will note that the covering is put in place before the floor is poured and that the concrete of the joist fills the cells of the tile and bears directly on the flange of the beam

NATCO GIRDER AND COLUMN COVERING

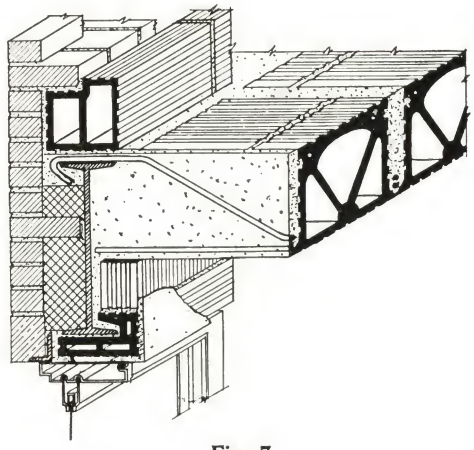


Fig. 7

At spandrel beams over window heads and in similar places, a long clip tile can be furnished to give a good return for plastering and at the same time thoroughly fireproof the underside of the beam. Note illustration of the "Natcoflor" system and of Natco Unibacker wall construction

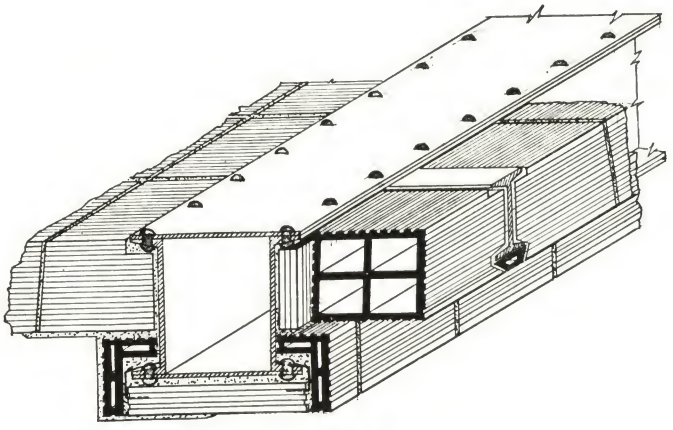


Fig. 8

Box Girders or any riveted sections are protected on soffit by hanging proper length of 3″ book tile on bottom by means of steel hangers (furnished by the contractor) and covering the ends of these with long lip angle tile. This fireproofing is done before the arches are set

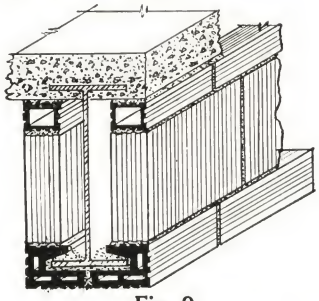


Fig. 9

Fireproofing with concrete slab floor construction. Note the extreme saving in dead load on these large girder beams due to the hollow construction. These beams are often covered after the floor is in place, thus permitting the use of the bottom flange to support floor forms

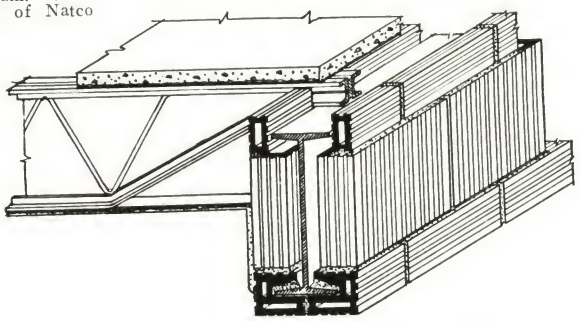


Fig. 10

The various types of light weight floors constructed of a thin slab of concrete on top of some form of light metal joist, which is protected only on under side by an ordinary coat of plaster on metal lath, are only rated as a semi-fireproof construction. We here show method of protecting the structural steel members used in connection with such construction by covering the tile entirely up to the under side of the concrete slab

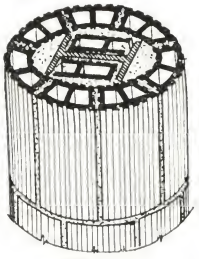


Fig. 11

Like the Bullnose Column Covering, not much of the 3″ Circular Covering is carried in stock, but any normally sized order can be manufactured in a reasonable time. The radius of the tile is 10″ on the outside and it is suitable for columns 16″ to 28″ in greatest dimension. This material is sold at a price based on the square foot of exterior surface.

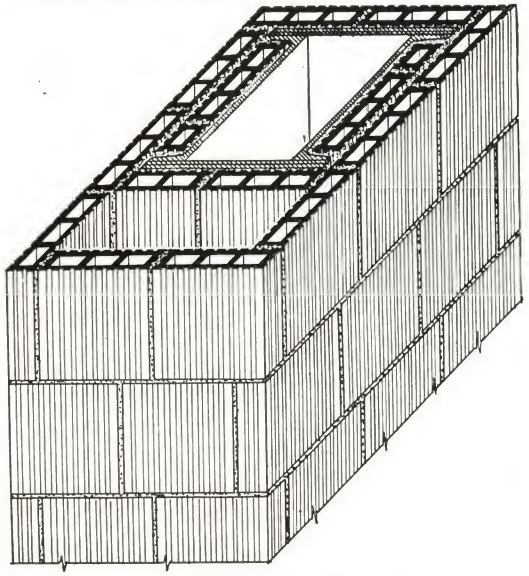


Fig. 12

Shows method of providing pipe space and vent ducts by building same in conjunction with the protection of the steel columns

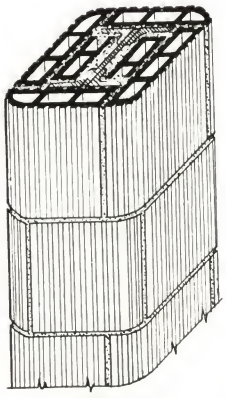


Fig. 13

Shows use of 3″ Natco Bullnose Tile in encasement of columns. No great quantity of this tile is carried in stock, but same can be manufactured on short notice, where requirements justify same

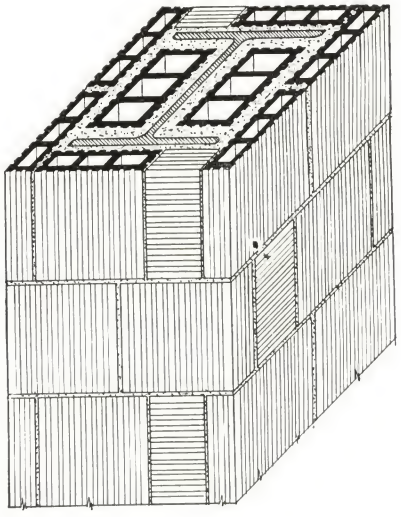


Fig. 14

Structural steel columns are most economically protected by encasing them with at least 3″ of hollow tile

NATCO GIRDER AND COLUMN COVERING

NATCO FACE TILE

Natco Face Tile, with either smooth or tex finish, as ordered, is manufactured at our factory at Natco, New Jersey.

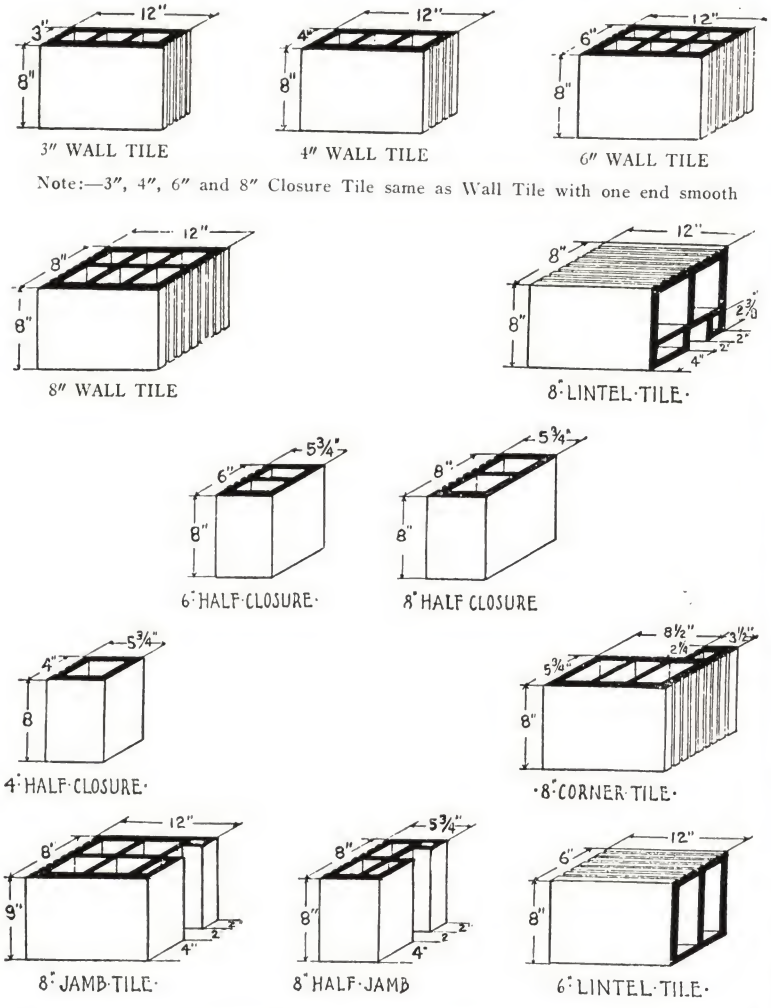
For general use, the kiln run of colors will be found the most satisfactory and pleasing combination. This tile can be furnished also in a one color range (not one shade) of very pleasing effect with one face tex finish and the other face smooth or scored.

Natco Face Tile is used principally in territory tributary to our New Jersey plants. It was developed and has been used successfully to meet a large demand for a hollow tile unit with a smooth or texture face for factories, railroad warehouses, farm buildings, etc. It is adapted especially to panel or curtain walls between reinforced concrete piers or columns. In the 8" size, jambs and lintels for standard steel sash can be furnished.

Red or black mortar joints add greatly to the appearance of the wall.

When ordered, a proper proportion of half blocks is shipped to break joints.

Special shapes to build complete walls are illustrated at the right.



NATCO FACE TILE

WITH SMOOTH OR "TEX" FINISH AS ORDERED

MANUFACTURED AT OUR NATCO, N. J. PLANT

NATCO FACE AND COMMON BRICK

(Produced at plant at Port Murray, N. J.)

General:

Natco brick are made from a shale clay, properly burned, resulting in a brick of excellent structural qualities. They rate highly in compression and rupture tests and have a moderately low absorption.

Grades and Types of Brick:

NATCO COLONIALS:

Selected smooth red brick with flashed and dark brick for relief.

NATCO TEX BRICK—FULL RANGE:

A rough textured face brick in blended range of reds, browns, blues, etc.

NATCO CLINKERS:

Rough overburned brick of odd shapes, etc., in reds, browns, blues, blacks, etc., mixed indiscriminately.

NATCO K/R SMOOTH REDS (COMMON):

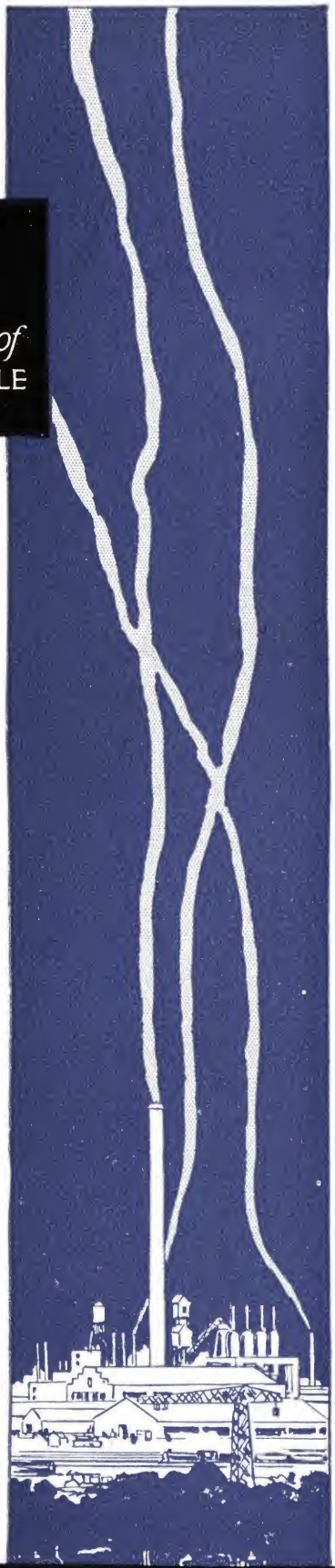
A smooth red brick not selected. An extra quality common brick of full size, well burned. Selection can be made in this class of brick for face brick purposes, at extra cost.

Samples of all brick will be submitted upon request.

NATCO FACE AND COMMON BRICK

NATCO

THE *COMPLETE* LINE *of*
STRUCTURAL CLAY TILE



NATIONAL · FIREPROOFING · CORPORATION

GENERAL OFFICES: FULTON BLDG., PITTSBURGH, PA. BRANCH OFFICES: NEW YORK, CHANIN BLDG.; CHICAGO, BUILDERS BLDG.; PHILADELPHIA, ARCHITECTS BLDG.; BOSTON, TEXTILE BLDG.; WASHINGTON, D. C., NATIONAL PRESS BLDG.; BIRMINGHAM, ALA., MARTIN BLDG. IN CANADA: NATIONAL FIREPROOFING COMPANY, OF CANADA, LTD., TORONTO, ONT.

THE LARGEST CONCERN IN THE WORLD MANUFACTURING A COMPLETE LINE OF STRUCTURAL CLAY TILE AND UNDERGROUND CLAY CONDUIT

SPEEDTILE—"THE TILE WITH A HANDLE"

(U. S. Patent No. 1,803,158. Patents Pending in U. S. and Canada)

WHEELER BUILDING TILE CO., INC.

(Agents for the Patentee)

FORT MYERS, FLA.

MANUFACTURING AND SALES OFFICES

ST. LOUIS, MO., Alton Brick Company
ATHENS, TEX., Athens Brick & Tile Company
TORONTO, CAN., The Cooksville Co., Ltd.
EL PASO, TEX., International Brick Company
MALVERN, OHIO, Malvern Clay Company
ROCKFORD, IOWA, Rockford Brick & Tile Company
SPRINGFIELD, ILL., Springfield Clay Products Company
WASHINGTON, D. C., United Clay Products Co.
HARLINGEN, TEX., Valley Clay Products Co.
FOND DU LAC, WIS., Wisconsin Shale Products Corporation

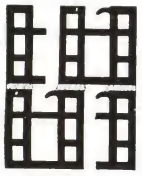
Address Inquiry to Nearest Representative

Construction

Speedtile

Hollow tile has for years been one of the best methods for fireproof construction, and it has always given satisfaction both as a fireproof and a load bearing material. One difficulty experienced with hollow tile is that of handling, but Speedtile has entirely eliminated this trouble.

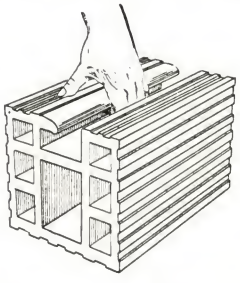
Speedtile is constructed with a handle, specially designed and built into the unit, so that a laborer or mason can pick it up by simply hooking his fingers under it. This handle is so placed as to give the correct balance to the tile. Above all, the handle is smooth and entirely free from sharp projecting particles of clay.



13 TILE WALL

It is conservatively estimated that mason contractors can cut their labor costs from 15 to 30% by the use of Speedtile, and a like saving is apparent in handling the material from the cars.

With Speedtile, a heavy load-bearing wall can be constructed as cheaply as with ordinary partition tile of standard shape.

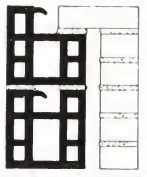


Strength

The crushing strength of Speedtile is more than sufficient to conform with any building code. All Speedtile units have four vertical walls, so spaced that a mason *must* get his mortar over all of them, thus distributing the load evenly and utilizing the full load-bearing capacity of the unit, and, as all vertical walls are in alignment, there are no weak places in any part of the structure.

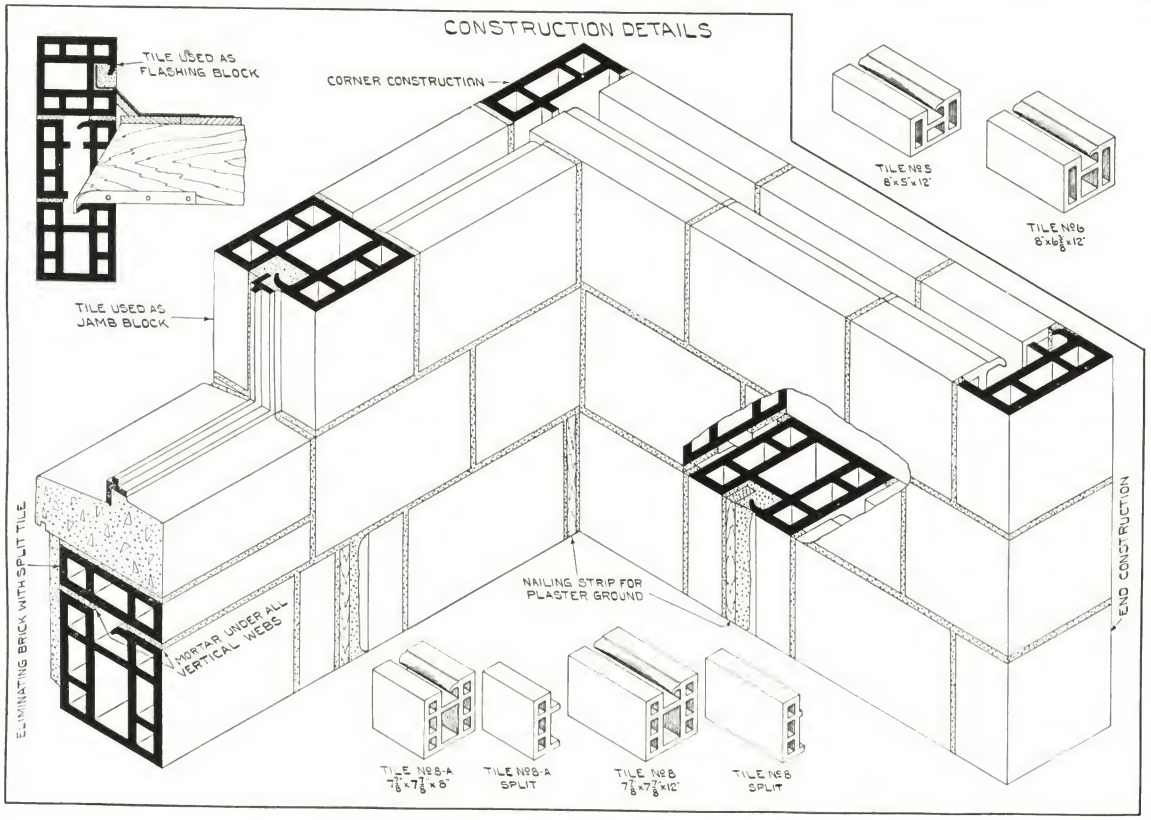
Other Uses

The handle-forming recess in Speedtile, as illustrated herein, forms a perfect receptacle for roof flashing, anchoring of steel sash, casement and check rail window frames, ground blocks and for running of electric conduits, etc. The broken mortar joints guard against moisture on interior walls, thus plaster may be applied direct to the tile without the use of furring.



FACE BRICK CONSTRUCTION

Price competitive with all other loadbearing tile.



KRAFTILE COMPANY

Kraft-Enamel Structural Tile with Wall Tile Finish in Plain Colors and Decorating Effects

MAIN OFFICE AND PLANT
NILES, ALAMEDA COUNTY, CALIF.

BRANCH OFFICES

ATLANTA, GA., Red Rock Building
CHICAGO, ILL., 567 East Illinois Street
CLEVELAND, OHIO, 807 Union Building
DETROIT, MICH., 815 Fox Theater Building
LOS ANGELES, CALIF., 4963 Sunset Boulevard
NEW YORK, N. Y., 101 Park Avenue
PHILADELPHIA, PA., 1718 Cherry Street
SAN FRANCISCO, CAL., 525 Market Street

EXPORT OFFICE: W. W. Mitchell, Manager, Robert Dollar Building, SAN FRANCISCO, CALIF.

Kraftile Products

KRAFT-ENAMEL HOLLOW TILE, structural tile with a wall tile finish in plain and decorative effects for Partitions and Exterior Walls.

KRAFT-ENAMEL BRICK, in standard and special sizes.

For Kraftile High Fired Decorative Faience Tile, Scum Gutters for swimming pools, and Special Opaque Kraftile for use in public washrooms, etc., see Manufacturers' Index.

STRUCTURAL TILE WITH WALL TILE FINISH

Kraft-Enamel Structural Tile

Hollow building tile has for years enjoyed wide architectural acceptance for interior partitions and exterior curtain and load bearing walls.

Kraftile High Fired Faience Tile has established beyond question its distinctive advantages for interior and exterior walls, since it combines colorful beauty with unsurpassed qualities of endurance.

Now Kraft-Enamel Structural Tile combines in one material hollow tile construction and wall tile finish.

How Kraft-Enamel Is Made

Kraft-Enamel structurally is a hollow tile of exceptional quality. It is true to size and shape and entirely free from warps, cracks and checks. It is made by the exclusive Kraftile one-fire monolithic method.

By this method the body and enamel face are fired in *one* continuous burning at an extremely high temperature. Thus a hard burned body is produced to which the enamel is *fused*. The enamel can never lift or spall from the face.

The body of the tile is a cream colored fire clay, the same as that used in manufacturing Kraftile Faience Wall Tile. This body, plus the high temperature burning, produces a tile of very high structural strength.

Compressive strength of Kraft enamel 4x6x12-in. load bearing hollow tile with four open cells making up 39% of the total volume averages 1740 lbs. per sq. in.

The enamel finish is the same as used for Kraftile Faience Wall Tile which has shown such remarkable resistance to wear and temperature changes.

In Plain Colors and Decorative Effects—Kraft-Enamel is made in the same wide selection of colors as Kraftile Faience, ranging from oyster white and cream through sepia, tans, blues, greens, orchids, pinks to black. It also is available in distinctive mottled effects.

The delicate gradation of the colors and the semi-matt finish are the same as have brought Kraftile its artistic acceptance.

Borders and inserts are available in a variety of pleasing designs. Special shades and designs are made to order.

Kraft-Enamel Uses

For Partitions, Lobbies and Vestibules—This unique combination of structural and wall tile not only makes possible great economies but gives the sound-deadening and fire-resistant qualities inherent in hollow tile construction.

The unusual size of the tile is arresting, and its colorful finish in a variety of plain colors, mottled and decorative effects, offers a stimulating field for artistic ingenuity. Various bonds can be employed and their effect is heightened by the infinite color gradations comparable with the finest of faience tile.

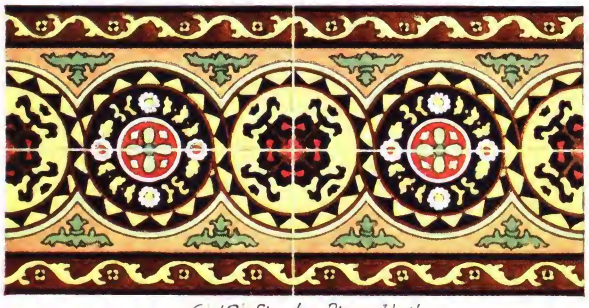
As a Veneer—Kraft-Enamel tile is also used as an exterior and interior furring and veneer, in place of enamel and face brick and architectural terra cotta.

For Curtain and Load Bearing Walls—To all the advantages that hollow building tile offers for curtain wall and load bearing wall construction, Kraft-Enamel adds its distinctive finish— as permanent and free from upkeep costs as it is beautiful.

For Swimming Tanks—Kraft-Enamel is an ideal material for plunge work. Its lovely colorings and striking border effects will make a tank of fascinating beauty—at a cost far less than that of its equal in artistry, Kraftile Faience Wall Tile. It members with the Kraftile Improved Scum Gutter shown here, which is furnished in matched colors. Kraftile Scum Gutter can be cleaned from the rim of the pool and yet it is so designed that a swimmer's foot cannot be caught in it.

9"x9"

9"x9"

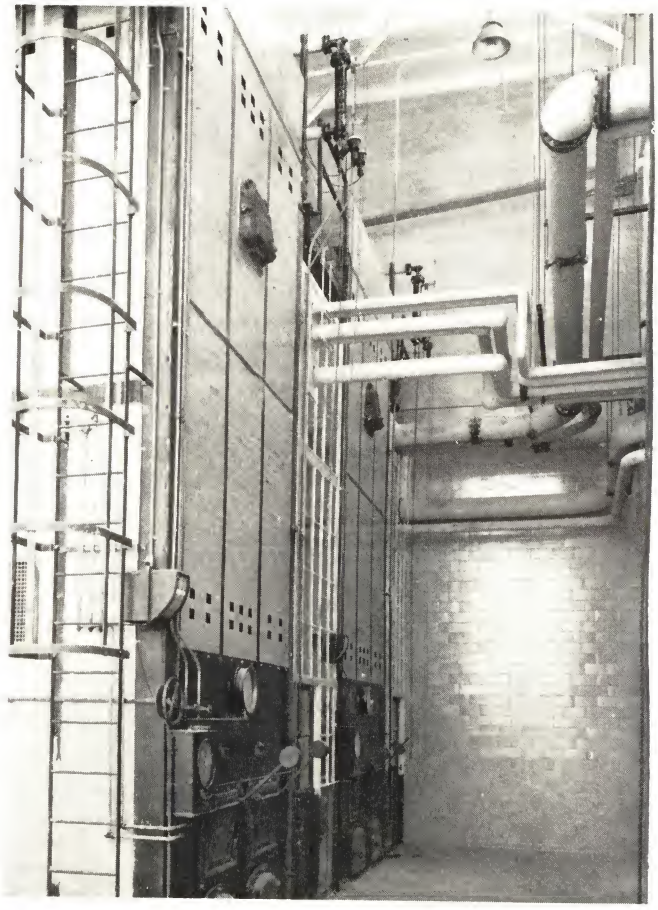


6"x12" Single Piece Units.

(Above and Below) 6"x12" Border

ABOVE:
Several of the hundreds of colorful effects obtainable when decorative treatment of Kraft-Enamel Hollow Tile is desired.

LEFT:
The entrance of the Eng-Skell Building, San Francisco, is made strikingly modern with Kraft-Enamel Hollow Tile in black, plum and metallic gold.



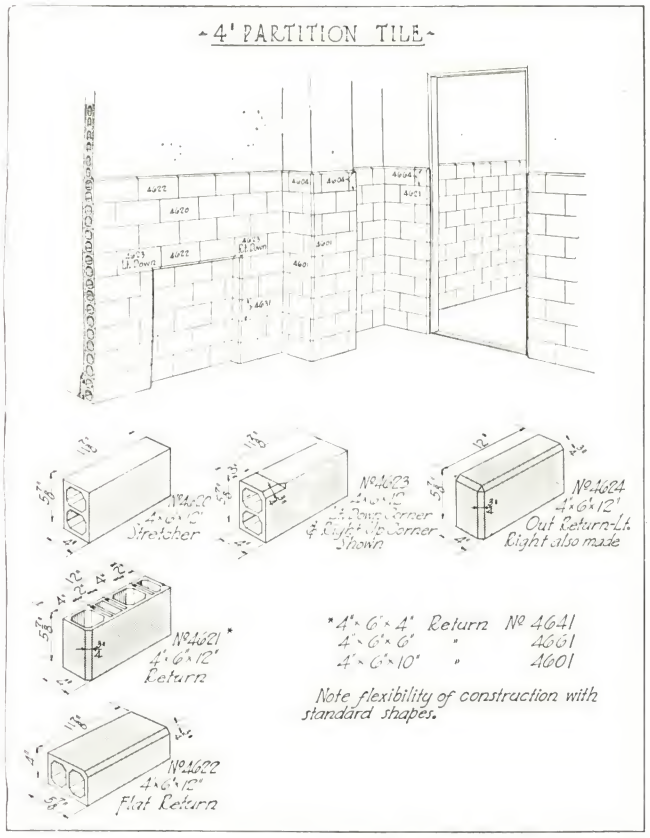
ABOVE: Kraft-Enamel Structural Tile and Glazed Brick in Ford Motor Co. Plant, Richmond, Cal.

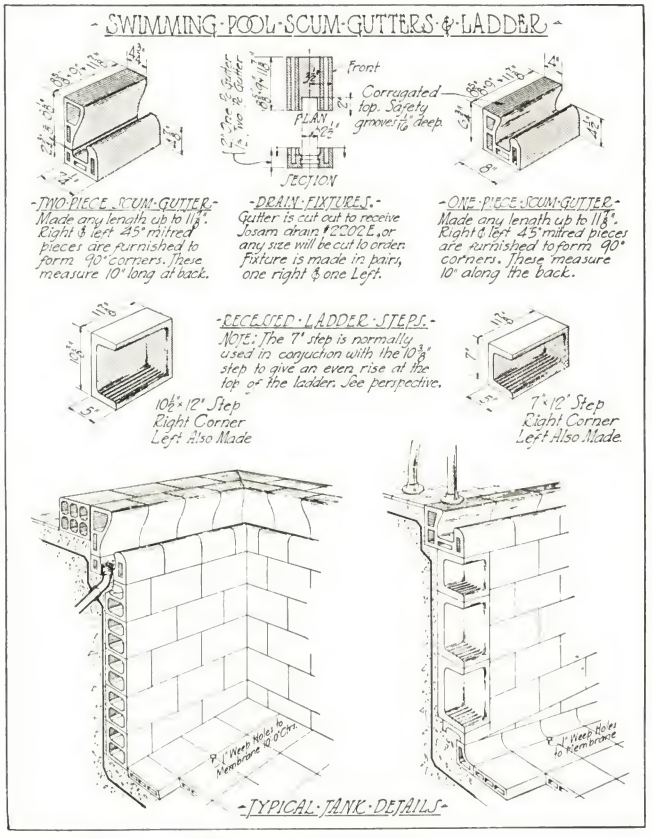
A few of the buildings in which Kraftile Company's products have been used:

	Architect
New York Central Station, Buffalo, N. Y.	Feldheimer & Wagner
St Mary's College, Milwaukee, Wis.	Herbst & Kuenzil
Christian Science Benevolent Home, San Francisco	Henry Gutterson
John D. Rockefeller, Cleveland, Ohio (Residential project)	Andrew J. Thomas
Park-Presidio Junior High School, San Francisco	W. H. Crim, Jr.
Roosevelt Junior High School, San Francisco	Miller & Pfleuger
Stockton High School, Stockton, Cal.	Peter L. Sala
Woman's State College, Tallahassee, Fla.	State Architectural Dept.
Aptos Junior High School, San Francisco	Shay & Shay

	Architect
Balboa Junior High School, San Francisco	Bakewell & Weihe
U. S. Veterans' Hospital, Tucson, Ariz.	U. S. Veterans' Construction Department
Eng-Skell Co., San Francisco	Engineering Dept.
Willowbrook Creamery Co., Oakland, Cal.	M. I. Diggs
Kraft-Phenix Cheese Corp., Atlanta, Ga.	Engineering Dept.
Glen Falls School, Glen Falls, N. Y.	Tooker & Marsh
Yonkers Statesman Bldg., Yonkers, N. Y.	Jas. Y. Rippin
John R. Rogers High School, Spokane, Wash.	Wells & Dow
Ford Motor Co. Plant, Richmond, Cal.	Albert Kahn, Inc.

BELOW: Kraft-Enamel Structural Tile in Kraft-Phenix Cheese Corp. Plant, Atlanta, Ga.





Typical Pages (Greatly Reduced) of Kraft-Enamel Hollow Tile Manual

Recommendations—Kraft-Enamel Hollow Tile is recommended for *partitions, lobbies, vestibules, store fronts, curtain walls, load bearing walls, swimming tanks, elevator shafts, kitchens, bathrooms, engine rooms, industrial buildings, food plants, hospitals, schools, dormitories, subways, tunnels, railroad stations* and *residence work.*

Kraft-Enamel Advantages

Interbonds Perfectly—Kraft-Enamel Hollow Tile interbonds perfectly with hollow tile and common brick, and its fire clay body has a high affinity for mortar.

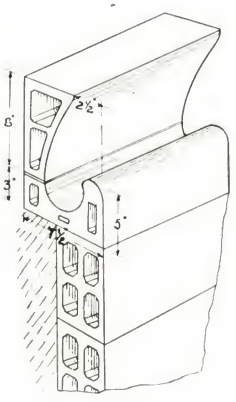
One Material and One Craft for Wall and Finish—With Kraft-Enamel, one craft, the mason, does the entire job of erecting and finishing the partition or exterior wall.

Kraft-Enamel is so true to size and shape that it will lay perfectly with a 1/8-in. joint and when pointed up compares favorably with the finest tile setting.

The saving in labor cost and time is obvious. The cost is far less than that of finishing an exterior wall, lobby or vestibule with architectural terra cotta or enameled brick.

A Wall Free from Upkeep Costs—In schools, hospitals, public buildings, etc., the cost of periodical plastering, painting and redecorating is an item of great consequence.

With walls of Kraft-Enamel these heavy recurrent expenses are entirely eliminated. The wall will never need any attention aside from an occasional washing as long as the building stands. It is sanitary and the mellow light reflection afforded by the soft colorings and semi-matt finish is pleasing and restful to the eyes.



Scum Gutter for Swimming Pools

Kraft-Enamel Brick

Made by the same monolithic process, of the same fire clay body, with the same enamel as Kraft-Enamel Tile.

Available in all plain colors and in decorative effects; and in standard and special sizes.

The KRAFTILE COMPANY guarantees to furnish gratis for replacement any tile which shows manufacturing defects, such as glaze spalls, checks, stains, or fading within a period of two years.

Kraftile Cutter

KRAFTILE COMPANY manufactures an electric portable cutter for the true cutting at high speed of marble, tile, slate, etc., and especially recommended for cutting Kraft-Enamel Hollow Tile. Details regarding the Kraftile Cutter furnished on request.

Kraft-Enamel Manual

We show here, greatly reduced, two pages of the Kraft-Enamel Hollow Tile Manual, now on the press, giving complete details and specifications for Kraft-Enamel.

The Manual will be mailed free to architects and others interested, from whom we invite inquiries and the opportunity to furnish estimates.

NEW JERSEY HOLLOW TILE CORPORATION

1328 Broadway
NEW YORK, N. Y.

DISTRIBUTORS FOR

ANNESS HOLLOW TILE & CLAY COMPANY
HENRY MAURER & SON
RARITAN HOLLOW TILE CORPORATION
NEW JERSEY CLAY PRODUCTS, INC.

Products

HOLLOW TILE for Partitions, Furring, Column and Girder Covering, etc.

Also Load Bearing and Enclosure Tile for use with face brick.

Facilities

The plants of the Company are well located with extensive tidewater, rail and truck facilities.

The Company is in position to service building operations of any size with efficiency and dispatch.

"Jersey" Bell Backer Hollow Tile

A system of hollow tile wall construction which eliminates *all* continuous mortar joints through the wall. It insures a wall weighing only 70% of a solid brick wall of the same thickness, thereby saving in the amount of steel required for wall columns and spandrel beams at a cost of approximately 70% of a solid brick wall.

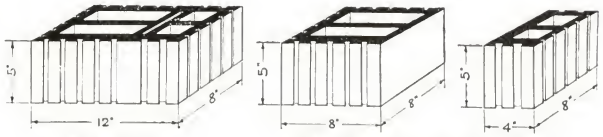
Sizes—"Jersey" Bell Backer Hollow Tile are made in 8, 10 and 12-in. thicknesses and in various heights to accommodate special sizes of brick and mortar joints.

Each 8-in. "Jersey" Bell Backer Hollow Tile, with ½-in. mortar joints, lays 0.715 sq. ft. of wall surface.

"Jersey" Utility Block

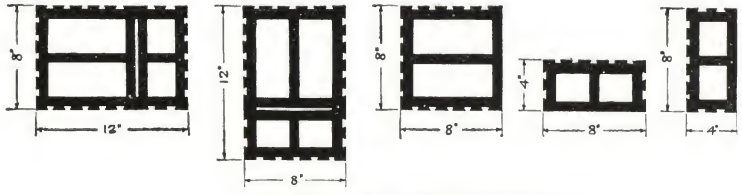
Combines the good qualities of brick and tile. Eliminates all costly and unsightly patchwork.

Balanced for one hand set in a complete closed unit, one and one-half bricks long. Readily divisible with trowel into two completely closed end units of brick and half-brick lengths.



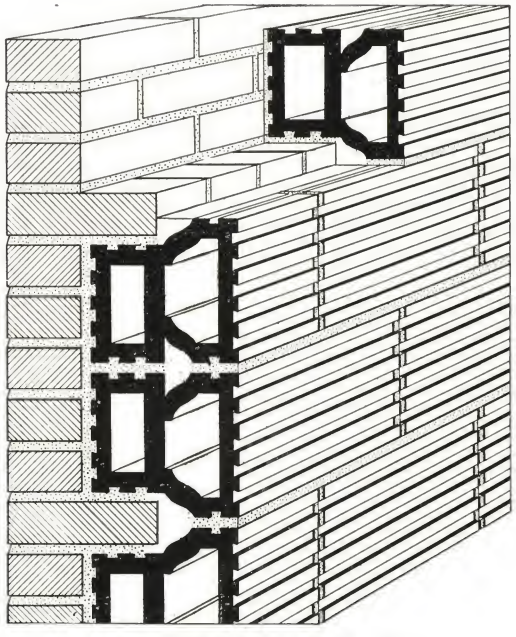
One Unit — The Divisions of the Unit

Provides and completes five positions in the wall without waste, and can be used to build any required length or thickness in multiples of brick and half brick lengths in closed end set construction to end of wall.

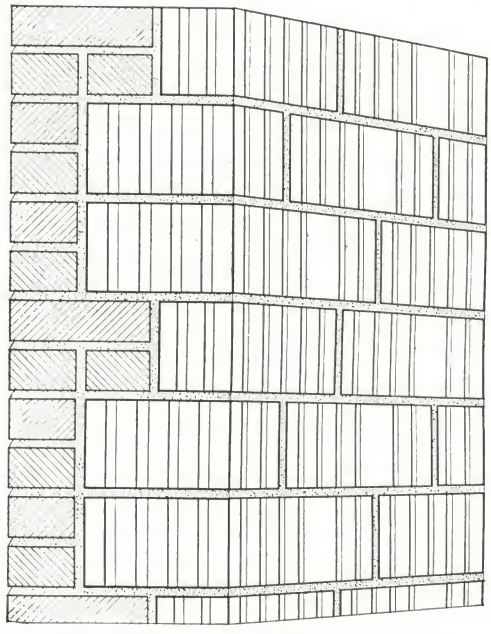


Five Positions in Wall Construction

The 8x5x12-in. "Jersey" Utility block is supplemented with a 4x5x12-in. size, also divisible into brick and half-



"Jersey" Bell Backer Hollow Tile



"Jersey" Utility Block Wall Construction

brick lengths. This is used particularly for column covering, pipe chases and other wall details.

"Jersey" Utility jambs, terminals, pipe chases and all wall details show the same desirable construction that a through section of the wall would show. It is very easy to show a through section of any wall, but only "Jersey" Utility blocks can build details in the same design and construction from start to finish in any required header bond.

"Jersey" Raritile Enclosure Blocks

In the past few years, there has been a remarkable increase in the use of hollow tile blocks in conjunction with either common or face brick for building curtain walls for skeleton steel structures. This type of construction not only shows a marked saving in labor costs, but it also decreases the weight of the walls so constructed by about 30%, and thereby effects a proportional saving in the amount of steel required for wall columns and spandrel beams.

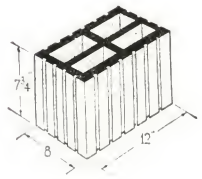
The "Jersey" Raritile enclosure tile protected by W. G. Demarest patents Nos. 1,426,048 and 1,479,379, has the good features common to systems in which hollow tile is tied in to face brick and has also the following additional advantages:

(1) A continuous vertical air cell on the interior of the wall running from floor to floor eliminates the necessity of additional separate furring blocks.

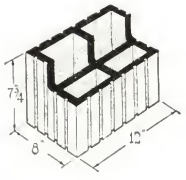
(2) The mortar joints are broken—there are no continuous joints through the wall.

(3) The blocks are of uniform height and approximately of uniform weight. This feature helps to speed up construction and makes it easy to tie in the face brick with any type of bond.

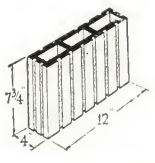
(4) The wall is so designed that webs and shells of the various blocks are in perfect alignment. In this way all material acts in compression and the full bearing strength of the tile is utilized.



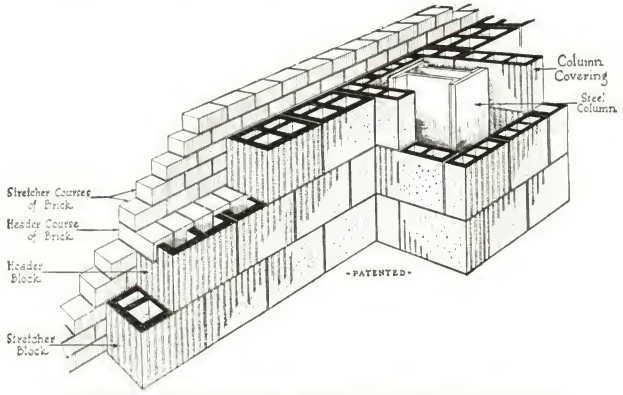
STRETCHER BLOCK



HEADER BLOCK



COLUMN COVERING



BLOCKS ARE MADE OF PROPER HEIGHT TO TIE IN WITH BRICK FACING

"Jersey" Raritile Enclosure Blocks

STANDARD SIZES AND APPROXIMATE WEIGHTS

Type	Size, in.	Number of cells	Weight per piece, lb.
Load-bearing	3¾x12 x12	3	20
Load-bearing	6 x12 x12	6	30
Load-bearing	8 x12 x12	6	36
Load-bearing	10 x12 x12	6	42
Load-bearing	12 x12 x12	6	48
Load-bearing	12 x12 x12	9	52
Bell backer	8 x12 x 7¾	2	26
Bell backer	10 x12 x 7¾	2	33
Bell backer	12 x12 x 7¾	3	36
Raritile stretcher	8 x12 x 7¾	4	28
Raritile header	8 x12 x 7¾	4	24
Raritile stretcher	10 x12 x 7¾	6	35
Raritile header	10 x12 x 7¾	6	31
Raritile stretcher	12 x12 x 7¾	6	38
Raritile header	12 x12 x 7¾	6	34
Column covering	2¼x 8 x12	2	13
Column covering	2¼x12 x12	3	20
Column covering	3¾x12 x 7¾	3	15
Column covering	3¾x12 x12	3	23
Utility blocks	4 x12 x 5	2	9
Utility blocks	8 x12 x 5	4	19
Backup	3¾x 5 x12	1	9
Backup	8 x 5 x12	3	16
Partition	2 x 8 x12	2	10
Partition	2 x12 x12	3	15
Partition	3 x12 x12	3	15
Partition	4 x12 x12	3	16
Partition	6 x12 x12	3	22
Partition	6 x12 x12	6	24
Partition	8 x12 x12	6	30
Partition	10 x12 x12	6	36
Partition	12 x12 x12	6	48
Furring	1½x12 x12	3/2	8
Furring	2 x12 x12	3/2	9

Some Recent Installations of "Jersey" Enclosure Blocks

New York, N. Y.

Building and Location	Contractor	Architect
Equitable Trust Building, Broad St. and Exchange Pl.	Thompson-Starrett Co.	Trowbridge & Livingston, New York, N. Y.
Roosevelt Hotel, Madison Ave. and 45th St.	Thompson-Starrett Co.	Geo. B. Post & Sons, New York, N. Y.
Heckscher Apartment, 277 Park Ave.	Thompson-Starrett Co.	McKim, Mead & White, New York, N. Y.
Paramount Theater and Office Building, 43rd St. and Broadway	Thompson-Starrett Co.	C. W. & G. L. Rapp, Chicago, Ill.
R. H. Macy & Co. Department Store, 34th St. and Broadway	Marc Eidlitz & Son, Inc.	Robert D. Kohn, New York, N. Y.
American Woman's Assn. Clubhouse, 357 West 57th St.	Marc Eidlitz & Son, Inc.	B. W. Morris, New York, N. Y.
Western Union Telegraph Building, Worth and Hudson Sts.	Marc Eidlitz & Son, Inc.	Voorhees, Gmelin & Walker, New York, N. Y.
New York Hospital Buildings, 70th Street and York Avenue	Marc Eidlitz & Son, Inc.	Coolidge, Shepley, Bulfinch & Abbott, Boston, Mass.
New Madison Square Garden, 50th St. and Eighth Ave.	James Stewart & Co.	Thomas W. Lamb, New York, N. Y.
New York Central R. R. Office Building, 45th St. and Park Ave.	James Stewart & Co.	Warren & Wetmore, New York, N. Y.
Lincoln Office Building, 60 E. 42nd St.	D. P. Robinson & Co., Inc.	J. E. R. Carpenter, New York, N. Y.
Apartment Houses, 1165 and 1175 Fifth Ave.	D. P. Robinson & Co., Inc.	J. E. R. Carpenter, New York, N. Y.
Mt. Sinai Nurses' Home, 5 to 17 E. 98th St.	Hegeman-Harris Co.	Robert D. Kohn & Chas. Butler, New York, N. Y.
Central Savings Bank and Office Building, 73rd to 74th St. and Broadway	Hegeman-Harris Co.	York & Sawyer, New York, N. Y.
Salvation Army Building, 120 W. 14th St.	Amsterdam Building Co.	Voorhees, Gmelin & Walker, New York, N. Y.
Office Building, 240 Madison Ave.	Edward Corning Co.	Cross & Cross, New York, N. Y.
McMillan Building, Fifth Ave. and 12th St.	Cauldwell Wingate Co.	Carrere & Hastings, Shreve & Lamb, New York, N. Y.
Park Lane Apartments, 299 Park Ave.	George A. Fuller Co.	Schultze & Weaver, New York, N. Y.
Railroad Co-operative Building, 44th St. and Lexington Ave.	George A. Fuller Co.	Sloan & Robertson, New York, N. Y.
Telephone Buildings, 206-214 West 18th Street	Tidewater Building Co.	Voorhees, Gmelin & Walker, New York, N. Y.

Other Cities

Jewish Hospital Buildings, St. Marks Ave., Brooklyn, N. Y.	Thompson-Starrett Co.	Crow, Lewis & Wick, New York, N. Y.
Penn Athletic Club, Philadelphia, Pa.	Thompson-Starrett Co.	Zantzinger, Borie & Medary, Philadelphia, Pa.
Shelbourne Hotel, Atlantic City, N. J.	George A. Fuller Co.	Warren & Wetmore, New York, N. Y.
Office Building, U. P. & Light Corp., Asbury Park, N. J.	D. P. Robinson Co.	Frank D. Chase, Inc., Chicago, Ill.
Brooklyn Telephone Building, Bridge and Willoughby Sts., Brooklyn	Cauldwell-Wingate Co.	Voorhees, Gmelin & Walker, New York, N. Y.
Five Apartment Houses, Standard Oil Co. of N. J., Bayonne, N. J.	Bayonne Housing Corp.	Andrew J. Thomas, New York, N. Y.
Van Tassell Apartment Houses, North Tarrytown, N. Y.	Tobin & McKenna	Andrew J. Thomas, New York, N. Y.
N. J. Bell Telephone Building, Broad and Lombardy Sts., Newark, N. J.	Turner Construction Co.	Voorhees, Gmelin & Walker, New York, N. Y.

HAYDITE MANUFACTURERS' ASSOCIATION

Haydite Concrete and Concrete Products

718 Scarritt Building, KANSAS CITY, MO.

LICENSED HAYDITE MANUFACTURERS

WESTERN BRICK COMPANY, Danville, Ill.
THE HAYDITE CO., Kansas City, Mo.; Pittsburgh, Pa.
HYDRAULIC-PRESS BRICK COMPANY, St. Louis, Mo.; So. Park, Ohio
JOHN H. BLACK COMPANY, Buffalo, N. Y.
CANADA: THE COOKSVILLE COMPANY, LTD., Toronto and Montreal

Haydite—a Lightweight

EXPANSIVELY BURNED CLAY OR SHALE AGGREGATE

Specially Manufactured for Use in Concrete in Place of Sand, Gravel, Stone or Other Materials

HAYDITE
The Lightweight Aggregate

Physical Properties

Haydite is produced from the same raw materials (clay or shale) as high grade brick. The raw material, after being reduced to a proper fineness, is introduced into a rotary kiln of substantially the type used for the manufacture of portland cement. In this revolving kiln it passes progressively through preliminary heating stages and finally reaches a zone of highest heat (over 2000° F.) near the discharge end of the kiln. As the material reaches the zone of highest heat it becomes viscous; it reaches a state of incipient fusion; gas is produced from substances contained in the natural raw material and by this process the material is caused to expand. The expansion is so complete that even the smallest particles show an ideal cellular structure when magnified. After the material is discharged from the kiln it is reduced, screened and graded into the standard commercial sizes used for concrete.

Haydite is thus composed of minute air cells, the walls of which are vitrified at over 2000° F. It is exceedingly light in weight, has great structural strength, is chemically inert and possesses unusual sound-thermo insulating value. *Haydite has no combustible content.*

Micro-photograph of Haydite Aggregate (Fine Particles) Showing Its Completely Cellular Structure

These cells, with walls of clay or shale vitrified at over 2000° F. give Haydite its light weight, strength and sound-thermo insulating value

Uniformity

The entire manufacture of Haydite, from raw material to finished product is under perfect control, assuring absolute uniformity at all times.

Commercial Sizes

The standard commercial sizes of Haydite Aggregate are: (A) 0x$\frac{3}{16}$ in. sand size used as fine aggregate; (B) $\frac{3}{16}$x$\frac{1}{2}$ in. used as coarse aggregate in precast concrete products, and (C) $\frac{3}{16}$x$\frac{3}{4}$ in. used as coarse aggregate for heavy precast products and general concrete construction.

Special sizes may also be obtained.

Advantages of Haydite Concrete

Concrete made with Haydite Aggregate has all of the properties of ordinary concrete plus a number of advantages which are so important that the product is in rapidly growing demand by architects and engineers for a large variety of structural purposes.

Haydite concrete is 30% to 40% lighter than natural aggregate concrete as shown by the following comparison of weights per cubic foot:

Natural aggregate concrete	145-150 lbs.
All-Haydite structural concrete	90-100 lbs.
Haydite-and-natural-sand concrete	100-112 lbs.
All-Haydite Special insulating and floor-fill concrete	60- 75 lbs.

In addition to this saving in weight, Haydite concrete is equal to ordinary stone or gravel concrete in strength and durability, as proved by authoritative tests.

Its fire-resistance is fully established by the Bureau of Standards and Underwriters' Laboratories, Inc. It is chemically inert, so gives full protection to reinforcing bars and other metal parts. In sound-thermo insulation it ranks with the most efficient structural materials.

Uniformity in all these properties is assured by the raw material and manufacturing process of the aggregate.

Reducing Dead Loads with Haydite Structural Concrete—Haydite concrete has attracted the universal attention of architects and engineers because it has solved one of the most severe problems of building construction—*reduction of dead load without sacrifice of structural soundness.*

Due to this lighter weight combined with full strength, the use of Haydite concrete results in substantial savings in both structural steel frame and reinforced concrete buildings.

The economy and advantages of this weight-saving construction have been demonstrated through experience in such buildings as the Victor F. Lawson Memorial Y. M. C. A., Chicago, Ill.; Park Plaza Hotel, St. Louis, Mo.; Southwestern Bell Telephone Building, Kansas City, Mo.; Equitable Building, Des Moines, Iowa; and Chicago Athletic Association, Chicago, Ill., and many others.

In many cases, the extreme lightness of Haydite concrete has made it possible to increase the number of additional stories that could be added to existing buildings without overloading foundations.

Contractors who have had experience with Haydite concrete will testify to the economy with which it may be mixed and handled on the job. No special equipment is necessary.

Haydite Floor Systems

The same advantages which make Haydite ideal for general structural purposes also apply to lightweight fireproof floor construction. Standard Haydite precast floor units are provided as fillers and these may be used with ordinary, or, preferably, with Haydite concrete.

This construction offers: (1) saving in cost, (2) improved sound-thermo insulation, (3) fire-safety, (4) plastering economy. At the same time, Haydite floor units used with Haydite concrete slab effect a reduction of dead load that runs from 25% to 40% as compared with ordinary tile joist construction.

Where a concrete floor fill is necessary to cover pipes, conduits, etc., use Haydite concrete floor fill. This is a special concrete of extremely light weight (60-75 lbs. per cu. ft.) and offers a truly exceptional insulating efficiency.

Kansas City Power & Light Building, Kansas City, Mo.

Hoit, Price & Barnes, Architects C. A. Glass, Structural Engineer
All concrete in the superstructure, including floors and fireproofing, is Haydite concrete; Precast Haydite Floor Tile used as filler between joists in all floors.

Haydite Precast Structural Specialties

The many superiorities of Haydite concrete have led to its adoption for a large variety of precast specialty products.

Haydite precast concrete roof decks are made by several reliable manufacturers and are famous for their light weight, insulating value and structural advantages. The same is true of Haydite precast floor slabs, which have had particular success in bridge construction. Other specialties include decorative spandrels, floor beams, precast columns and cast stone products.

Data and Service

The manufacturers of Haydite will provide complete information regarding Haydite concrete in all of its forms, including detailed specifications for mixing and placing. Experienced Haydite engineering specialists are available for consultation on all concrete problems.

LIGHTWEIGHT HAYDITE BUILDING UNITS

Haydite Building Units are manufactured by a large group of concrete products plants, each serving a convenient trade area, and all selected for their reliability and efficiency. The units are made in accordance with rigid specifications and by methods supervised by the Haydite manufacturers, giving assurance of uniformly high quality.

Superior Features

Haydite Building Units offer a forward step in modern masonry construction because in them the major values are contained in *one* material.

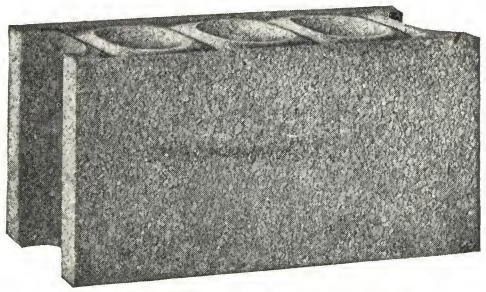
This "multiple-utility" system of construction simplifies building and eliminates specialized materials. But that is not all, for Haydite Units produce a superior wall of reduced weight and at an ultimate saving in cost.

Light Weight—Haydite Unit walls weigh approximately 20% less than hollow clay tile, 40% less than ordinary concrete blocks and 60% less than common clay brick. They offer the lightest of fire-resistant walls.

Fire Resistance—This property is attested to by high ratings from both the Underwriters' Laboratories, Inc., and the U. S. Department of Commerce Building Code Committee.

Thermal Insulation—Haydite Building Units provide an unusually high degree of heat insulation. Internal conductivity of 8-in. unplastered walls is 0.30 B.t.u. as determined by Armour Institute of Technology, Chicago.

The need for special insulating materials is therefore normally eliminated in Haydite walls.



Standard 8-in. Haydite Building Unit

Sound Insulation—Haydite Unit walls afford a high degree of sound insulation, as shown by authoritative test data. Ideal for partition walls in schools, hospitals, apartments, etc.

Strength—Haydite units fully meet and in most cases considerably exceed the strength requirements of local building codes. Full test data available.

Plaster and Stucco Base—The surface texture of Haydite Units offers the ideal base for plaster and stucco, furnishing an excellent key or mechanical bond. Even suction permits proper seasoning and holds permanently. Plastering directly on exterior wall units of 8 in. or more in thickness and in all partitions is approved practice, saving expense of furring and lathing. Trueness of the unit wall saves plaster and speeds application. Danger of cracks reduced to minimum.

Ageproof, Dampproof—Severe tests have shown the very low capillarity of Haydite Units, and their great permanence. Unaffected by time or weather.

Non-corrosive—Haydite is chemically inert; will not affect pipes, conduits, or other embedded metal parts.

Low Breakage—The units are extremely tough and danger of breakage in handling, trucking and shipping is negligible.

Saving of Labor—The large, light weight units are easy to handle and their trueness and wide mortar bed makes for unusual speed in laying.

Saving in Mortar—Since one 8x8x16-in. Haydite Unit replaces 12 standard brick or 2.1 hollow tile (5x8x12 in.), a large reduction is made in mortar materials and labor.

Nailing and Cutting—Wood trim can be nailed directly to the units, eliminating costs of placing nailing plugs in the wall. Cutting and channeling is handled speedily without danger of breakage.

Saving in Cost

These many properties not only provide masonry construction of superior value, but have the gratifying additional benefit of economy in construction and maintenance. In many cases, these features of economy alone lead to the adoption of Haydite Building Unit construction. This is especially true when the collateral economies (such as the elimination of furring and lathing, plastering economy, elimination of insulating materials, etc.) are fully considered.

Simplicity of Construction

There is nothing about Haydite Building Units which requires special methods of construction or structural design. Their use, in fact, is a much simplified process that helps to offset the human element in building and insures a superior wall without unusual precautions. The shapes and sizes of units are in accordance with both practical experience and research, and it is possible to handle intricate construction problems without difficulty.

The more important details of construction are shown on the following page.

Standard Shapes and Sizes

The most commonly used standard Haydite Units are:

	Nominal size	Actual size
4-in. partition and back-up unit....	4x8x16 in.	4 x7¾x15¾ in.
8-in. masonry and back-up unit....	8x8x16 in.	8 x7¾x15¾ in.
12-in. masonry and back-up unit....	12x8x16 in.	12 x7¾x15¾ in.
Header brick	.....	2¼x3¾x 8 in.

Also furnished in header units, jamb and joist blocks, special grooved joist blocks for steel windows, square end units, solid units and fractional units. In addition there are numerous intermediate and special sizes furnished according to the locality. There are some variations in design, percentage of core space, etc., in accordance with local construction practices, but these are of a minor nature.

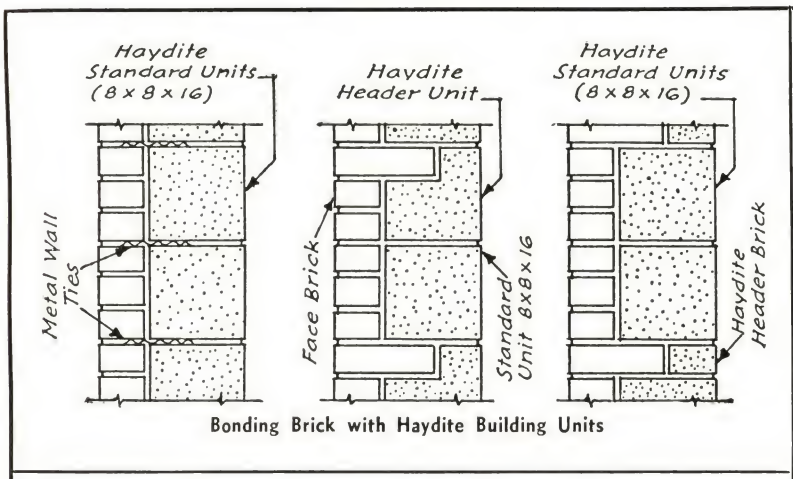
Haydite Lintels are supplied 7¾ in. high, in widths of 3¾, 5¾ and 8 in., and in lengths from 2 ft. 8 in. to 10 ft. 8 in.

Sound Deadening Walls of Unplastered Haydite Building Units

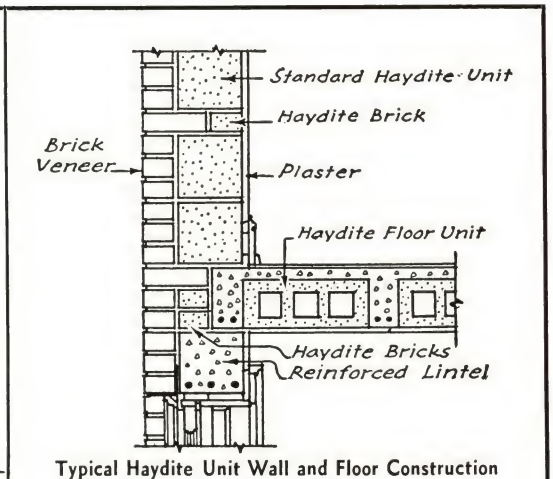
Efficient sound deadening can now be obtained not merely without extra cost but *at an actual saving* through the use of unplastered Haydite Unit walls. This type of construction has been widely used for the interiors of churches, auditoriums, recreation halls, assembly rooms, gymnasiums, institutional dining rooms, bowling alleys, industrial plants, etc., combining excellent control of sound with fire-resistant walls of pleasing appearance.

Thos. A. Edison School, Dearborn, Mich.

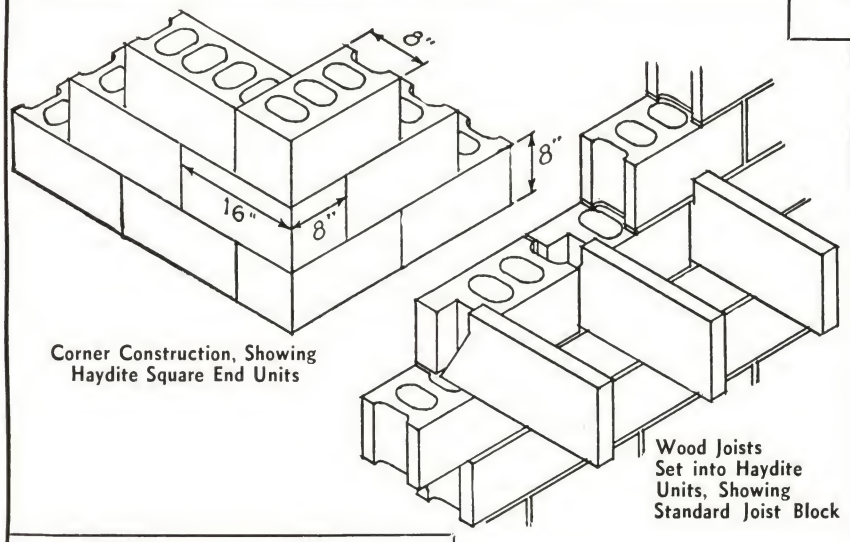
Geo. D. Mason & Co., and H. C. Vicary, Associate Architects
Showing Haydite sound deadening walls of unplastered random ashlar units



Bonding Brick with Haydite Building Units

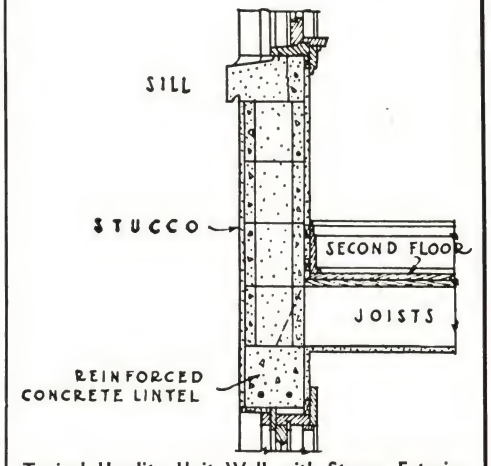


Typical Haydite Unit Wall and Floor Construction

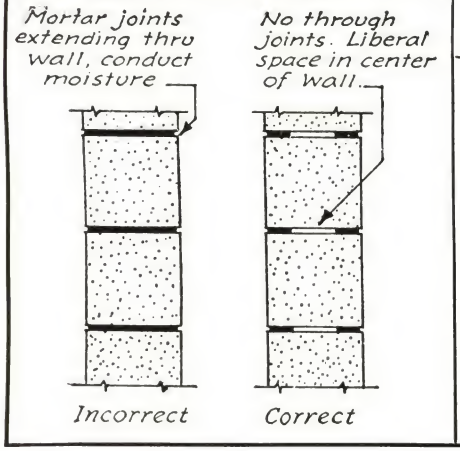


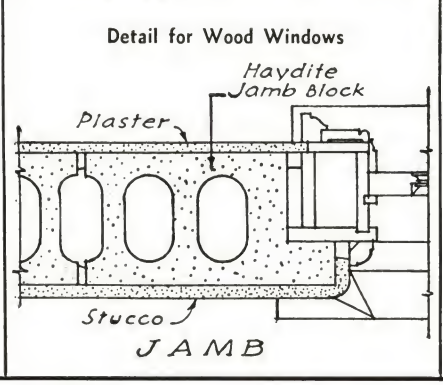
Corner Construction, Showing Haydite Square End Units

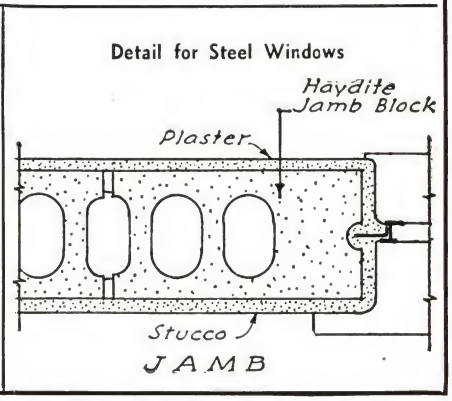
Wood Joists Set into Haydite Units, Showing Standard Joist Block



Typical Haydite Unit Wall with Stucco Exterior







CONSTRUCTION DETAILS FOR HAYDITE BUILDING UNITS

Unexcelled Acoustical Properties. The natural surface of Haydite Building Units gives them the highest coefficient of sound absorption of ordinary fire-resistant masonry materials, and one of the highest in any class. Authoritative test data proves this fact.

No Special Materials or Construction Needed. In Haydite acoustical walls, the ordinary standard units are laid in the usual way, with joints neatly pointed up. The wall is left unplastered, thus effecting a big saving in building costs. No special construction is involved. The wall may be decorated by the use of paint sprayed on and in various other ways, or by the use of random ashlar units as shown in the accompanying illustration on previous page.

Data and Service

A complete Architects' Data Book on Haydite Building Units will be supplied upon request, and both the manufacturers of Haydite and the concrete products plants which make the units offer the services of competent Haydite Specialists for consultation with architects and engineers.

THE NAILCRETE CORPORATION

Manufacturer of Nailcrete Blocks and the Original Nailing Concrete

105 West 40th Street
NEW YORK, N. Y.

For Nailcrete, see Manufacturers' Index

NAILABLE CINDER CONCRETE BUILDING BLOCKS

Origin—Nailcrete Nailable Cinder Concrete Building Blocks were developed after extensive laboratory research and tests in the "Studies in Economic Construction" conducted by Grosvenor Atterbury, F.A.I.A., for the Russell Sage Foundation.

NAILCRETE
PATENTED - NAME REG.

Nailcrete (Nailing Concrete)—A cementitious, fibrous, all-mineral compound containing no animal or vegetable matter.

Uses—Nailcrete Blocks are used in load-bearing walls, partition walls, and as an efficient and economical backup of cut stone, cast stone, and brick veneered walls.

Sizes — Nailcrete Blocks are furnished in all sizes and fractions of sizes useful in constructing 3, 4, 6, 8, 12 and 16-in. masonry walls.

Economy—Cost of Nailcrete Block walls average 10% to 20% less than clay tile or gypsum, and 20% to 40% less than brick.

Nailability and Nail-holding—In addition to accepting nails better than yellow pine, Nailcrete Blocks *hold nails* better than commonly used cinder concrete. Nailability is not obtained by extreme porosity, but rather by the gripping and highly abrasive action of the Nailcrete contained in the composition. The lightest trim or moulding can easily be attached to interior walls, and shingles, siding or weatherboards to exterior and exposed walls.

Lightness—Because of the inherent lightness of the aggregates used—Nailcrete (2½ cu. ft. to 100 lb.) and cinders (2 cu. ft. to 100 lb.)—Nailcrete Blocks are among the lightest load bearing masonry units made. This reduces the dead load and often permits the use of lighter steel with subsequent savings.

Weight—Composed of Nailcrete, sized cinders and cement, Nailcrete Blocks of the most widely used size—8x8x16 in.—vary in weight from 30 to 40 lb. in exact proportion to their compressive strengths, ranging from 600 to 1200 lb. per sq. in.

Strength—Ample to meet uses to which material is put and requirements of local building rules. Can be furnished in any required strength, but nailability is a diminishing quality in the higher strengths, except with special masonry nails. Strength increases with age.

Elasticity and Toughness—The great elasticity of cinder concrete was conclusively proven by the U. S. Government Watertown Arsenal Tests of 1898. This quality of Nailcrete Blocks permits rough handling without the breakage incident to the use of ordinary tile and block.

Fireproof—Cinder concrete has long been accepted as one of the best fireproofing materials. Nailcrete Blocks, made of cinders, Nailcrete and cement, are incombustible and extremely fire resistive.

Lack of Capillarity, Thermal Conductivity, and Sound Conductivity—The multiplicity of tiny non-connecting pores or cells of Nailcrete Blocks render this material particularly resistive to capillarity, or wicking of moisture, transmission of heat, cold, and sound.

Textures—Two distinctive textures are furnished. One (R) rough, coarse, and full of crevices, for best mechanical bond for mortars, plasters and stuccos; the other (S) smooth, fine grained and dense for walls to be painted or for exposed interior or exterior walls.

Co-efficient of Expansion—Co-efficient of expansion of Nailcrete Block walls is approximately the same as that of steel.

Tests

Nailcrete Blocks are periodically tested for strength, nailability, weight, and absorption, at the Haller Testing Laboratories, Plainfield, N. J., and Philadelphia, Pa.; Camden Forge Structural Materials Laboratories, Camden, N. J., and other outstanding laboratories.

Reports of tests furnished on application.

Specification for Nailcrete Nailable Building Blocks

For plastered, stuccoed or exposed exterior or interior walls:
All load-bearing exterior and interior walls, and all partition walls will be of Nailcrete Nailable Building Blocks.

For backup of cut stone, cast stone and brick walls:
All backing of outside walls will be of Nailcrete Nailable Building Blocks.

STRUCTURAL GYPSUM CORPORATION

Gypsteel Partition Tile, Beam and Column Covering

EXECUTIVE OFFICES
LINDEN, N. J.

NEW YORK OFFICE, 535 Fifth Avenue
OTHER SALES OFFICES IN THE PRINCIPAL EASTERN CITIES

Products

GYPSTEEL GYPSUM PARTITION TILE.

Also Gypsteel Gypsum Soffit Slabs, Shoe Tile and Column Covering.

For Gypsteel Gypsum Plasters and Gypsteel Pre-cast Gypsum Roofs and Floors, see Manufacturers' Index.

Facilities

The central location of our plant at Linden, N. J., makes rapid deliveries possible in the New York Metropolitan Area. Orders will be delivered in 24 hours and if received in the morning can be delivered the same afternoon. Our trucks deliver direct to the job or to the dealer's yard.

STRUCTURAL GYPSUM CORPORATION is one of the two largest producers of structural gypsum products in the United States.

Construction Details and Installation

Our architectural service sheet No. 4 contains complete construction details and specifications, as well as full directions for installation. A copy of this service sheet will be sent on application to any of our offices.

GYPSTEEL GYPSUM PARTITION TILE

Where Gypsteel Gypsum Partition Tile May Be Advantageously Used

(1) Non-bearing partitions, walls of corridors, and column covering.
(2) Fire division walls.
(3) Covering for steel members, such as girders, beams, and columns.
(4) Heat ducts and light wells.
(5) Elevator, dumbwaiter, corridor and stairway enclosures.
(6) Wall furring (when split).

Special Advantages of Gypsteel Gypsum Partition Tile

The high quality of Gypsteel Gypsum Partition Tile is due to the combination of purity of the gypsum with a distinctive process of control that insures uniformity in the finished product.

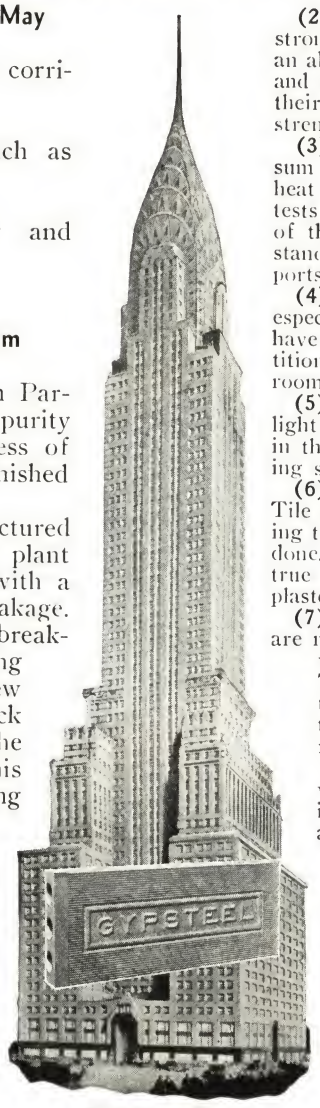
The great purity of gypsum manufactured by the Gypsteel Process at our Linden plant insures a stronger and tougher block, with a minimum waste from chipping and breakage.

Another factor tending to minimize breakage and waste is our express trucking service within and adjacent to the New York Metropolitan area, whereby block is delivered from our mill direct to the job within a few hours by truck. This truckload delivery assures clean, strong block free from breakage and waste.

The machinery by which Gypsteel Block is made at our Linden plant insures absolute accuracy and produces blocks true to size, accurately proportioned, and of uniform weight, strength and density.

General Advantages of Gypsum Partition Tile

(1) Fireproof—Gypsum Partition Tile are approved for first class fireproof construction by the Building Departments of all cities and have the highest rating in all Insurance Rating Bureaus.



Chrysler Building

One of the many modern buildings in which Gypsteel Partition Tile are used throughout

(2) Savings in Labor—Gypsteel Partition Tile are stronger than ordinary tile. Breakage is reduced to an absolute minimum with resulting savings in material and labor. Additional savings are achieved because of their accuracy in size and uniformity in composition, strength and weight.

(3) Heat Insulation—The great superiority of gypsum partition tile in preventing the transmission of heat has been frequently demonstrated by numerous tests under many conditions. Distinctly high qualities of thermal protection for embedded steel are an outstanding characteristic of gypsum partition tile. Reports of actual tests are available on request.

(4) Sound Insulation—Tests made many times, especially at the New England Conservatory of Music, have demonstrated the superior value of gypsum partition tile in retarding conduction of sound from one room to another.

(5) Light Weight—Gypsum Partition Tile are so light in weight that their use effects a large reduction in the total dead-load, and this permits of corresponding savings in the steel framework and foundations.

(6) Savings in Plaster—Gypsteel Gypsum Partition Tile are strong, they chip and break very little, meaning there is less mortar used, and less pointing-up to be done. Their uniformity of size and proportions assure true plaster base and effect a substantial saving in the plastering.

(7) Perfect Plaster Base—Gypsteel Partition Tile are made of gypsum, with a very small percentage of wood planer chips, and laid up in gypsum mortar. The chemical bond established between the gypsum tile, and the gypsum in both the mortar and plastering, produces a wall of great strength and rigidity.

(8) Easily Altered—Gypsum partition tile cuts with a saw, permitting of alterations being made in partitions with a minimum of expense and annoyance.

Sizes

All Gypsteel Partition Tile are 12x30 ins. They are furnished in standard thicknesses 2, 3 and 4 ins. solid and 3, 4, 5 and 6 ins. hollow.

WEIGHT PER SQ. FT. OF GYPSTEEL PARTITION TILE

Description of Gypsteel Furring and Partition Tile	Weight tile per sq. ft., lbs.	Weight mortar per sq. ft., lbs.	Total weight plastered one side per sq. ft., lbs.	Total weight plastered two sides per sq. ft., lbs.
2x12x30" Solid..	10.5	1.5	13.5	16.5
3x12x30" Hollow	11.0	2.0	14.0	15.0
3x12x30" Solid..	13.0	2.0	16.0	19.0
4x12x30" Hollow	13.0	2.5	16.0	19.0
6x12x30" Hollow	20.0	3.0	23.0	26.0

Note: Wt. plaster on one side, 3 lb. per sq. ft.

CERTAIN-TEED PRODUCTS CORPORATION

GYPSUM DIVISION

Manufacturers of Gypsum Partition and Furring Tile

GENERAL OFFICES
100 East 42nd Street
NEW YORK, N. Y.

For Sales Offices, see Gypsum Plaster Pages

PLANTS

ACME, TEX. AKRON, N. Y. FORT DODGE, IOWA GRAND RAPIDS, MICH. GYPSUM, OHIO LARAMIE, WYO. NORTH HOLSTON, VA. BLUE RAPIDS, KAN.

For Our Other Products, see Manufacturers' Index

GYPSUM PARTITION AND FURRING TILE

Our gypsum partition and furring tile is now identified under the following brand names: *"Certain-teed"* or *"Certain-teed Acme."*

The following data is pertinent to both brands.

Gypsum tiles are used for non-bearing construction in building interiors, such as partitions and wall furring, used as protection against fire on columns, in elevator shafts, stair wells, etc. These tiles possess all the necessary physical requirements for a perfect fireproofing material and, in addition, are light in weight, permitting easier and faster handling and cutting away of openings in a standard wall if necessary.

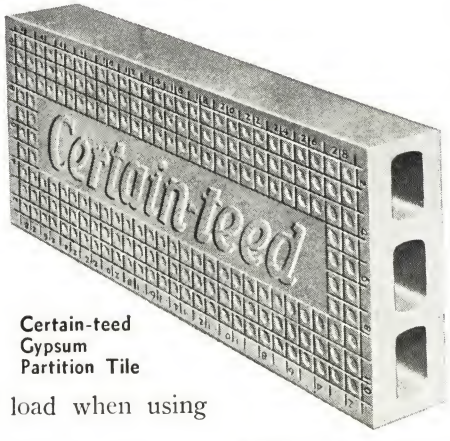
Gypsum partition tiles are also easily chased for conduits, switch boxes or pipe lines.

Grounds may be easily nailed to gypsum tile and bucks may be anchored by nailing with tenpenny cut nails directly into the end of each block course.

Another advantage of gypsum tile to be taken into consideration when designing the structural part of a building is the saving in dead load when using gypsum tile partitions.

Gypsum tile is not only extremely light, but because of the large units, less mortar is required for setting, and due to its uniform moulding in manufacture, accurate weight of gypsum is assured and a saving of plaster effected. All these savings tend to lessen the dead load and naturally reduce the cost of construction.

TRADE-MARKS



Certain-teed Gypsum Partition Tile

Fire Protection

Gypsum tiles have passed unusually severe and exhaustive tests on their fire-resistant properties. They are especially recommended for non-bearing, fireproof partitions, stairways and elevator enclosures, and unplastered, non-bearing warehouse partitions, and for similar construction where a highly fire-resistant material is required.

Non-conductor of Sound

Gypsum partition tiles are excellent nonconductors of sound and for that reason are recommended and successfully used in hospitals, schools, office buildings, apartments, hotels and all buildings where a soundproof partition is desired. Authentic tests determine that less than 1/100 of 1% of incident sound is transmitted through gypsum tile partition plastered with gypsum plaster.

Other Advantages

Gypsum tiles by test have been proved to embody maximum density, great crushing strength, supreme fire, sound, and vermin proof qualities, with slight water absorption and negligible breakage.

Certain-teed and *Certain-teed Acme* gypsum tile are marked off by inches both longitudinally and vertically. This feature minimizes labor expense and expedites erection.

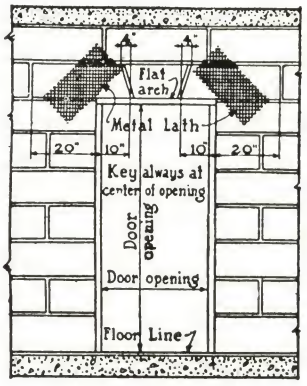
Laying

Gypsum unfibered plaster should always be used to lay these blocks. It makes a perfect bond and a stronger wall than either lime or portland cement mortar. Approximately ½ ton of plaster is required to set 1000 sq. ft. of block.

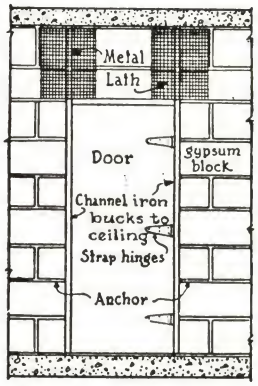
THICKNESS AND WEIGHTS OF CERTAIN-TEED AND CERTAIN-TEED ACME GYPSUM 12x30-IN. TILE

Thickness, in.	Ceiling heights up to —, ft.	Weight block per sq. ft., lb.	Weight mortar per sq. ft., lb.	Total Weight* per sq. ft., lb.	
				Plastered 1 side	Plastered 2 sides
2, solid	10	10.5	1.5	15.0	18.0
3, hollow	13	10.5	2.0	15.5	18.5
3, solid	15	14.5	2.0	19.5	22.5
4, hollow	17	14.5	2.5	20.0	23.0
5, hollow	25	17.0	2.7	22.7	25.7
6, hollow	28	19.0	3.0	25.0	28.0

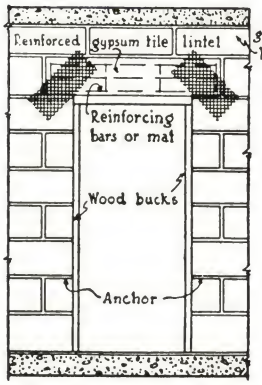
*Allowing 3 lb. per sq. ft. for plaster, one side; 6 lb. per sq. ft. for plaster, two sides. (½-in. grounds.)



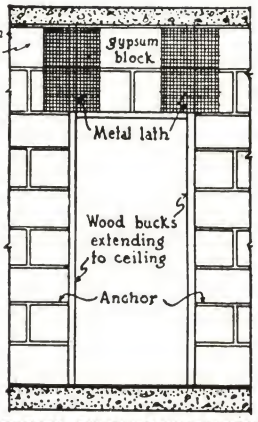
DETAIL SHOWING JACK ARCH CONSTRUCTION



DETAIL OF DOOR WITH CHANNEL IRON FRAME



DETAIL SHOWING REINFORCED GYPSUM LINTEL CONSTRUCTION



DETAIL SHOWING WOOD BUCKS

GYPSUM PARTITION TILE CONSTRUCTION DETAILS

BASIC SPECIFICATION FOR GYPSUM PARTITION AND FURRING TILE

Using Certain-teed or Certain-teed Acme Gypsum Tile in a Fireproof (Fire Resistive) Building

Notes: This specification is prepared for use in connection with the installation of non-bearing gypsum partitions and furring in a fire-resistive building. It may be used as written if the contractor for partitions and furring is a Sub-Contractor to the General Contractor. If, however, the gypsum partitions and furring are to be included under Mason Work, or Lathing and Plastering, according to locality and conditions the opening paragraphs (Section I (a), (b) and (c)) should be modified accordingly.

After various paragraphs will be found interpolated notes—which offer information and suggestions. Notes included in ( ) refer directly to preceding paragraph.

Following this specification will be found "General Notes" in explanation of various provisions of the specification which are referred to in the interpolated notes.

Alternate specifications are suggested and will be found in small type in [ ] inserted after the proper clauses or section of the main specification paragraphs.

Note for Specification Writer: When writing a specification for a project at hand it is only necessary to use the paragraphs that cover the type of construction contemplated. It may be necessary to slightly revise certain paragraphs to fit the individual requirements.

I. General

(a) The General Conditions of this specification are hereby made to constitute a part of the specification for the furnishing and installation of Gypsum Partition and Furring Tile.

(If partition and furring tile are to be furnished and set as a part of Masonry Work, or of Plastering Work, omit paragraph (a) and place the heading "Gypsum Partitions and Furring" at head of paragraph (b) changing it to (a).)

(b) This Contractor shall report any floors, door bucks, etc., and any walls, windows, etc., which are not secure, plumb, true and level to the General Contractor for correction before proceeding with any gypsum block work.

(In some parts of the country, the architect may wish to eliminate this provision depending upon local conditions; *see also Par. (a) under General Notes.*)

(c) This Contractor shall accurately lay out all partitions and furring and set one course of tile one block high before door bucks, etc. are placed.

(If Gypsum Partition and Furring are under Mason Contractors work, they will probably be laid out by the General Contractors superintendent and this paragraph may be eliminated.)

II. Extent of Work and Exceptions

(a) Furnish all materials, labor, scaffolding, etc. necessary to install and complete the following, ready for plastering.

(If there are any special places where gypsum block is to be used and any exceptions as here mentioned, this paragraph should be modified and the drawings noted accordingly.)

(b) All partitions enclosing or separating lobbies, corridors, rooms and elsewhere throughout the building, unless otherwise shown, marked or specified.

(c) All furring on the interior of all exterior walls and all other places so indicated.

III. Materials

Partition and Furring Tile

(a) All of the foregoing shall be constructed of ("Certain-teed" or "Certain-teed Acme") gypsum tile as manufactured by the CERTAIN-TEED PRODUCTS CORPORATION, New York, N. Y., or other tile meeting the tests of the American Society for Testing Materials if approved in writing by the Architect. All blocks shall be thoroughly seasoned before shipment.

(If other than the types of Certain-teed tile on which this specification is based are to be used modify Par. (a) accordingly.)

(See Standard Specifications for Gypsum Tile adopted by the American Society for Testing Materials.)

(b) Unless otherwise indicated or specified all partitions shall be of (3, 4 or 6) in. hollow tile and all furring of (3 or 4) in. "split" tile. Where 2 in. tile is called for on the drawings, they shall be solid and where tile 3 in. or more in thickness is called for, same shall be hollow.

(If it is desired for certain enclosures to use solid tile where hollow are here called for or vice versa, Par. (b) should be changed to suit.)

(c) All blocks for partitions and furring shall be of standard 12x30 in. size. Not more than 8% of the tile used shall be less than a whole block except where required to fill out spaces. After delivery on the site, tile shall be stored in a dry location, well protected from dampness.

(d) This Contractor shall do all cutting, fitting or patching of tile required to accommodate any partitions or furring to electrical conduits, plumbing and heating pipes, etc. which may be installed ahead of his work.

Mortar

(a) All gypsum tile construction shall be laid up with gypsum mortar composed of unfibred cement plaster as manufactured by the CERTAIN-TEED PRODUCTS CORPORATION, thoroughly mixed in the proportions, by weight, of 1 part gypsum to not more than 3 parts of clean, sharp, dry sand. Gypsum mortar shall not be retempered and only as much mortar as can be used in 3 hours shall be mixed at one time.

IV. Partitions

(a) The first course of all gypsum tile used for permanently located partitions and for furring shall be laid in a bed of gypsum mortar spread on the rough floor slab. Tile courses must not be started upon frozen concrete nor upon cinder concrete when such is used for the purpose of fill only. Wherever a tile, cement or terrazzo base, etc. is to be installed and in any basement partitions or furring the starting course shall be of hollow clay tile equal in thickness to the gypsum tile specified.

(When partitions may be of a temporary nature such as those sub-dividing office space they may preferably be started on top of the finished floor to facilitate possible changes. This applies except on wood floors where the blocks should be started on the underlying masonry construction. When such sub-dividing partitions are shown on plans and are to be started on the finished masonry floor they should be so indicated and Par. (a) amplified accordingly. *(See also Par. (b) under General Notes.)*

(Wherever wall tiles are to be set against gypsum block, the specification writer should provide under the Specification for Tile Work the paragraphs given below which are quoted from the Basic Specification for Tile Work, Revised Edition, 1924 of the Associated Tile Manufacturers.)

Specification for Tile Work

"Wherever tile work is to be set against gypsum tile this Contractor shall furnish and place a layer of building paper; this shall be overlaid with stiffened expanded metal lath or wire lath. Lath shall be secured in place by special anchorage or lacing as conditions require."

"At the option of the tile contractor, one heavy coat of asphaltum paint or other equal dampproofing coat may be substituted for building paper back of the metal lath specified for use on gypsum tile."

(b) The gypsum block of all partitions shall be laid in horizontal superimposed courses with vertical joints broken. All blocks shall be solidly bedded in mortar and all vertical joints shall be full. Partitions shall extend from the floor, as before specified, to the height indicated. All permanently located full height partitions shall extend to the underside of floor construction above and all other to the ceiling and shall there be wedged with wedges cut from the block and with the joints slushed from both sides with gypsum mortar.

(c) Partitions intersecting brick, or other masonry walls, shall be securely anchored to such walls by means of approved masonry bond or metal anchors, or by 10d nails driven into the masonry joints at each gypsum block course.

(d) Partitions shall be bonded at the corners by overlapping alternate courses back and forth (log cabin fashion). All intersecting partitions shall be bonded by overlapping not less than at every third course. Overlapping tile shall cover the courses below to the full thickness of the construction. The ends of overlapping tiles where exposed on the face shall have the cores plugged with mortar by this Contractor as the tiles are laid.

V. Furring

(a) The gypsum tile furring shall be laid as is herein required for partitions. Furring shall continue to frame wherever plastered or wood jambs are specified. All furring in contact with the construction shall be securely anchored to the masonry by means of 10d nails driven into the masonry joints at intervals not greater than every 2 ft. horizontally and vertically. Metal ties or other approved methods for securing furring to the masonry may be used.

Note: To avoid excessive breakage of furring tile in transit the CERTAIN-TEED PRODUCTS CORPORATION will furnish a 3 or 4-in. furring tile which can be easily split on the job, making a 1½ or 2 in. tile as may be required by the specification.

(See *"General Notes" Par. (c)* for data regarding the use of split furring against stone walls.)

VI. Bucks

(See also "General Notes" Par. (d) and (e).)

(a) **Wood**—Wood bucks will be furnished and set as specified under "Carpenter Work."

(b) All wood bucks of openings 3 ft. or less in width shall be secured to the ends of the partition tile with 10d nails driven into every course. For openings wider than 3 ft. anchor strips of metal lath, wire mesh or sheet metal shall be nailed or stapled securely to the bucks and built into each course by this Contractor.

(c) **Metal**—Metal bucks will be furnished and set as specified under "Metal Work" with anchors built into the partition by this Contractor.

(Both wood and metal bucks are referred to in the above paragraph. Provisions for either or both, as required, should be inserted, by the specification writer, in specifications for trades effected, as follows:)

Specification for Carpenter Work

"**Wood Bucks for Gypsum Partitions**—*At all doors, interior sash and all other openings required, bucks shall be furnished and set by this Contractor. They shall be not less than 1⅝ in. thick and of a width equal to the thickness of the block and shall have not less than ½ in. grounds nailed to the sides and projecting beyond the bucks not less than ¾ in. forming a rabbet to receive the ends of the partition tile. All bucks shall be carefully braced plumb and true and left ready to receive gypsum tile, finished jambs, heads and trim."*

"**Wood Bucks for Gypsum Furring**—***Note:** As these will vary according to kind of wall, location and reveal of windows and doors the architect should here describe to suit or refer to detail drawings."*

"**Other Bucks**—***Note:** The Architect should here specify bucks for openings in any walls or partitions of other materials than gypsum."*

Specification for Metal Work

"**Metal Bucks**—***Note:** The architect should here specify the metal bucks for openings in walls and partitions. It is not considered practical to include definite specification for same herein, as the type of metal buck to be used and the method of installation will depend upon the height of the partition, size of opening and other features of construction."*

VII. Nailing Strips and Grounds

See also "General Notes" Par. (f)

(a) Nailing strips for baseboards, chair rail and such trim will be furnished by the Carpenter and shall be set in the gypsum tile construction by this Contractor or as otherwise arranged by him.

(b) The nailing strips, not less than ⅞ in. thick and of such other dimensions as to completely cover the end of the block, shall be nailed directly to one end of each gypsum tile with not less than four 10d nails. Nailing strips for toilet and other heavy fixtures shall be 1½ in. thick and shall be spaced 15 in. o.c.

(c) Plaster grounds will be furnished and set as specified under Carpenter Work.

(Nailing strips are referred to in the above paragraphs. Provisions should be made in the specification for Carpenter Work for the furnishing of nailing strips and grounds, as follows:)

Specification for Carpenter Work

"**Nailing Strips and Grounds**—*Furnish the contractor for Gypsum Tile Work with nailing strips to be spaced 30 in. on center wherever baseboard, chair rail, etc., occur—these shall be ⅞ in. thick, 12 in. long and in width equal to the thickness of the block specified for partitions and furring."*

VIII. Lintels

Note: Several types of lintels are here specified, each of which has its suitable use according to the size of the opening, type of block, height of ceiling, etc. As any or all of these may occur in one building, the architect should select the type applicable, and cross out any of those not to be used.

For Openings Not Over 22 in. Wide

(a) **Built-up**—Openings in partitions of gypsum tile which are not more than 22 in. in width shall be spanned by a gypsum tile which shall have a bearing at each end upon the jamb of not less than 4 in.

For Openings Not Over 4 ft. Wide

(a) **Jack Arch**—When openings are more than 22 in. but not more than 4 ft. in width, the gypsum tile over the opening shall be laid in the form of a jack arch. Skewbacks shall be cut in the tile used over the jambs, intermediate tile shall be beveled to fit the skewbacks, and a key block to fit shall be set in the center of the jack arch. Bevel cuts shall not be less than 4 in. to the foot. The skewback tile shall have a bearing on the jambs of not less than 12 in. nor shall they be set so as to project beyond the face of the jambs to a distance greater than ⅓ of the bearing.

(b) When jack arch construction is employed, the jack arch shall be reinforced with strips of not less than No. 14 gauge woven wire mesh not less than 2 in. wide, or the reinforcement may consist of 2 strips of not less than No. 24 gauge perforated metal not less than 1 in. wide. The reinforcement herein prescribed shall be continuous and shall be bedded in the mortar joint between the jack arch and the course immediately above extending into the partition construction not less than 30 in. beyond the face of each jamb.

(Jack arches may often be omitted when substantial header bucks are used but this is a case for decision on each individual job. It has been suggested that mat reinforcement set in a bed of mortar on paper on top of the wood buck and the tile set immediately to secure a good bond would prove very efficient. With an additional strip of reinforcement in the next course, this method would probably prove satisfactory for openings up to 6 ft. wide when the ceiling height is not unusual. This method is merely suggested here as a possible alternate.)

For Openings More Than 4 ft. Wide

(a) **Metal**—Openings in partitions of gypsum tile which are more than 4 ft. in width shall be spanned by metal lintels as shown on the drawings or as specified under "Iron Work." All metal lintels shall be of such form as to provide a distributed and uniform bearing upon the supporting construction and shall provide a bearing upon each jamb of not less than 8 in. (Unless supported by the metal buck.)

IX. Blank Heading

Note: This space is left blank in order that the architect may include specifications for arched openings or other special features not provided for under other headings.

X. Completion

(a) This Contractor shall leave his work complete and the premises clean of mortar, broken tile and rubbish resulting from his work. All partitions and furring shall be left rigid, plumb and true ready to receive plastering.

XI. Plastering

Note: If it is desired to include plastering as a part of this work the following specification paragraphs should be included, otherwise the specification writer should include them in his own Specification for Lathing and Plastering. *The use of gypsum plaster on gypsum tile is strongly recommended.*

(a) All base plaster shall be (Certain-teed, Acme, American or Southern) brand of (Neat Plaster, Fibred Cement Plaster or Unfibred Cement Plaster) sanded according to specifications for all base coat work, and all finishing plaster shall be (Certain-teed, Acme, American or Southern) brand of Gypsum (Finishing or Gauging) Plaster, as manufactured by the CERTAIN-TEED PRODUCTS CORPORATION, or other plaster if approved in writing by the architect.

(CERTAIN-TEED PRODUCTS CORPORATION also manufactures Prepared Sanded Plasters at Akron, N. Y., and Gypsum, Ohio, for base coat work, if desired, change Par. (a) accordingly.)
(If other than the types of Certain-teed, Acme, American or Southern plaster on which this specification is based are to be used modify Par. (a) accordingly.)

Sand

(b) All sand for base coats shall be clean and sharp, free from alkali, salt or quick-sand and from objectionable amounts of loam or clay and shall be graded from fine to coarse. All sand used shall meet the requirements of the A.S.T.M. specifications for plastering sand.

(If any sand float finish is to be included, the sand for same should be specified in Par. above.)

Mixing

(c) All plaster shall be mixed in clean, tight boxes and in accordance with best local practice, the intent of the specifications and the direction of the maker on file in the office of the architect.

(Mixing and the importance of clean water and direction of the maker are of vital importance to good work.)

XII. Proportions and Application

(a) The base coat shall consist of one part fibred plaster, to not more than three parts by weight of dry sand.

(b) Surfaces of the blocks shall be wet before plastering but not so wet that water remains standing on surface.

(c) The plaster shall be applied to a thickness of ½ in. beyond the block faces in two operations. A thin layer shall first be applied with strong pressure to secure a good bond and shall be followed immediately with a second layer which shall be straightened to a true, even plane keeping back sufficiently from the grounds, or inside the ½ in. thickness, to allow for finishing coat. The surface shall be broomed or otherwise roughened.

Finishing Coat

(a) *Smooth White Finish* shall be Prepared Gypsum Finishing Plaster mixed to the proper consistency with clean water only, and applied according to manufacturer's directions.

Note: If it is desired, a mixture of lime putty and finishing plaster may be used for the smooth white finishing coat in which case substitute the following paragraph:

[(a^1) *Smooth White Finish* shall be one measure of dry Gauging Plaster or Gypsum Finishing Plaster to not more than 3 measures of Finishing Lime Putty thoroughly and uniformly mixed. If lump lime is used it must be perfectly slaked. Hydrated Lime should be soaked for 24 hours before using.]

(b) Finishing coat shall be applied throughout the building except behind skirting and any place noted below and shall be smooth white finish trowelled to a dense, true surface.

(Here insert any exceptions)

Note: If *Sand Float Finish* is desired in some locations instead of *Smooth White,* add the following paragraph after, at end of, Par. (b), noting the exceptions and giving the locations.

[(b^1) *Sand Float Finish* shall be four measures Gypsum Cement Plaster unfibred, one measure of perfectly slaked fresh burned plasterer's lump lime putty or standard hydrated finishing lime and five measures of clean sharp sand.]

Note: This specification does not contemplate that colored, textural or special effects will be required as a finish in any portion of this job. If so, insert the location and description under *Finishing Coat* in appropriate paragraphs.

(c) Finishing coat shall be applied when the base plaster is set firm and hard and not until thoroughly dry. The surface of the base coat shall be sprinkled with water before the finish coat is applied.

(It is important that the base coat of any plastering job shall be thoroughly dry before the finish coat is applied. There are some who recommend that the finish coat shall be applied while the brown coat is damp. This, however, will permit *drying cracks,* if they occur, to show in the finish coat which will be obviated if the brown coat is permitted to dry first and then moistened to receive the finishing coat.)

(d) All surfaces throughout shall be applied and finished in the most workmanlike manner and shall be left plumb or level and true and even planed, free from trowel marks, blotches and without joinings showing.

(e) All finished plastering shall be protected from wind and in hot dry weather shall be sprinkled with water until set. In freezing weather, this Contractor shall arrange with the General Contractor that the plastering shall be protected from frost until set hard.

(In windy, hot, dry weather openings should be screened but not closed. In all clear weather after plastering has set, doors and windows should be kept open as fully as possible.)

GENERAL NOTES

Regarding the Provisions of the Preceding Basic Specifications

Note: The above Basic Specification, if used as herein given, will provide for all gypsum tile partition and furring required to make a complete job, also includes suggested specifications for plastering on gypsum tile, and useful data pertaining to the work of other trades that contact with gypsum tile work.

(a) The contractor for the gypsum tile work should be impressed with the importance of reporting any unsatisfactory conditions of parts to receive the partitions and furring as he will naturally be held responsible for the satisfactory installation of the tile ready for the plastering. *See Basic Specification I (a).*

(b) Gypsum Tile partitions may be started on finished floors except wood. This will allow the partitions to be moved at any time without requiring repairs to the floor. Where wood sleepers and floors are used, the partitions should, as specified, be started on the masonry construction. *See Basic Specification IV (a).*

(c) Due to the rough interior surface of rubble stone walls, split furring is not recommended for such locations. The use of a 2 in. solid tile built like a free standing partition inside the stone wall will be found very satisfactory. *See Basic Specification V (a).*

(d) Before specifying the type of bucks to be used, due consideration should be given to the height of the ceilings, the size, height and frequency of openings and character and weight of doors, if any, to be hung at such openings. Where the openings are numerous or large, or the doors heavy especially as in the case of fire doors, the bucks should extend from the floor to the ceiling. Metal lath, placed as specified in Section VIII will lessen the possibility of plaster cracks if any strain occurs at the junction of bucks in any partition. *See Basic Specification Section VI.*

(e) In specifying metal bucks, the architect should bear in mind those parts of the completed construction which come under the work of other trades and specify accordingly. Steel channel bucks under "Iron Work"; wood bucks, trim, etc. under "Carpenter Work"; the setting of the gypsum tile under "Lathing and Plastering." *See Basic Specifications Section VI.*

(f) All nailing strips and plaster grounds should be specified under "Carpenter Work." If patented grounds or nailing blocks are desired, so specify. Heavy fixtures such as toilets, tanks, blackboards, etc., should be bolted through the block or nailed to nailing bucks not less than 1½ in. thick of the character specified for other trim, spaced not to exceed 15 in. *See Basic Specifications Section VII.*

ROOFING

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SKYLIGHTS
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VENTILATORS

THE BARBER ASPHALT COMPANY

Genasco Bonded Asphalt Built-up Roofing, Flashings, Mastic and Waterproofing

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Genasco Trinidad Lake Asphalt Built-up Roofing

Engineering Data—Engineering facts prove a roof constructed of Trinidad Lake Roofing Asphalt and Genasco All Rag Felts contains more waterproofing than is obtained from the same form of construction employing oil asphalt produced from crudes of varying origin, in combination with felts of inferior quality.

Bonds—Genasco Trinidad Lake Asphalt Built-up Roofs will be bonded, when desired, by the United States Fidelity & Guaranty Co. of Baltimore, Md., which guarantees against maintenance expense for 10, 15, 20 years, depending upon type of roofing used. There is, also, a Genasco Flashing covered by a bond, when desired.

Approved Roofing Contractors—To insure the proper application of Genasco Trinidad Lake Asphalt Built-up Roofing, Approved Roofing Contractors, whose selection is based on thoroughness of workmanship and responsibility, have been appointed throughout the country.

Specifications are outlined in chart given below.

Genasco Asphalt Mastic Floors

Where floors must withstand heavy traffic, Genasco Asphalt Mastic Floors give unsurpassed service. Unsatisfactory old floors can be laid over without stopping production.

Genasco Asphalt Mastic Floors are: Resilient—of particular value to employees constantly on their feet. Sanitary—laid in a monolithic sheet, no cracks to catch dirt. Non-absorbent—do not retain odors and particularly desirable in food manufacturing plants. Waterproof—can be flushed without damage or leakage. Also noiseless, dustless, fire-resisting, acidproof and easy to repair.

Genasco Membrane Waterproofing Materials

Over half a century of experience enables us to furnish waterproofing asphalt and fabrics best suited for the most exacting conditions.

Our Engineering Department is eager to co-operate with architects on any problem involving a possible use of asphalt and will gladly recommend specifications to meet specific conditions.

TABULATION OF VARIOUS TYPES OF GENASCO TRINIDAD LAKE ASPHALT BUILT-UP ROOFINGS

Designation	Type of deck	Limitation of roof pitch, in.	Surface finish	Composition: Layers of Genasco all rag felt	Composition: Number of moppings of asphalt	Weight of materials, lbs.: All rag felts	Trinidad Lake Roofing Asphalt	Genasco Concrete Primer	Gravel surfacing	Slag surfacing	Total weight per square applied, lbs.: Smooth surfaced	Gravel surfacing	Slag surfacing	Underwriters' Laboratories rating	Term of guaranty bond, years	Specification to be followed for steel decks, gypsum, tile or over insulation
For General Purposes																
Genasco Standard Trinidad	Wood	None	Smooth	1 30-lb. felt (base) lapped 2 in. 2 15-lb. felts lapped 17 in.	3	60	90				150	570	470	A	10	
	Concrete	6	Smooth	3 15-lb. felts lapped 22 in.	4	45	120	10			175	595	495	A	10	Use for steel decks, gypsum, insulation
Genasco 15-year Bonded Roof	Wood	3	Gravel or slag	1 30-lb. felt (base) lapped 2 in. 2 15-lb. felts lapped 17 in.	3	60	110		400	300		570	470	A	15	
	Concrete	3	Gravel or slag	3 15-lb. felts lapped 22 in.	4	45	140	10	400	300		595	495	A	15	Use for steel decks, gypsum, insulation
Genasco 20-year Bonded Roof	Wood	3	Gravel or slag	1 30-lb. felt (base) lapped 2 in. 3 15-lb. felts lapped 22 in.	4	75	140		400	300		615	515	A	20	
	Concrete	3	Gravel or slag	4 15-lb. felts lapped 24½ in.	5	60	170	10	400	300		640	540	A	20	Use for steel decks, gypsum, insulation

Genasco Bonded Flashing—2 layers Genasco Flashing Fabric, 2 moppings asphalt with copper counterflashings.

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SECTION I

Flat Roof Specifications and Details

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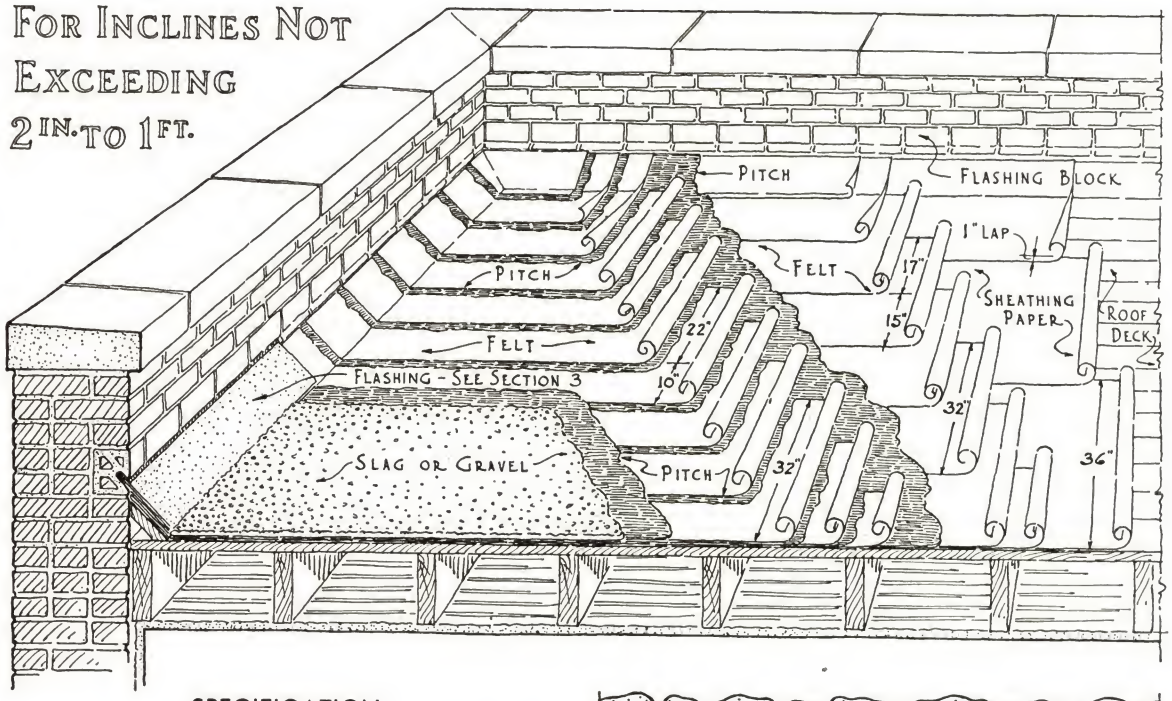
BARRETT SPECIFICATION ROOFS
20 YEAR GUARANTY BOND TYPE "AA"
FOR USE OVER WOOD DECKS



SPECIFICATION

The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knot holes, and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

First—Lay one (1) thickness of sheathing paper or unsaturated felt weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

Second—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one and nail as often as is necessary to hold in place until remaining Felt is laid.

Third—Coat the entire surface uniformly with Specification Pitch.

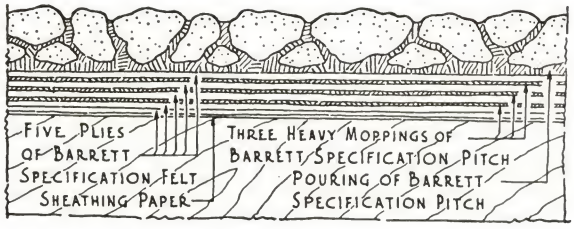
Fourth—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches, over preceding one, mopping with Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done along the upper edge of each sheet so that all nails will be covered by not less than two (2) plies of Felt.

Fifth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and fifty (150) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by The Barrett Company. He shall furnish The Barrett Company's Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Co. of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

Note No. 1—The Barrett Company will give its twenty (20) year Guaranty Bond on all jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by The Barrett Company in strict accordance with the above specification and subject to Barrett inspection and approval.



FULL SIZE SECTION

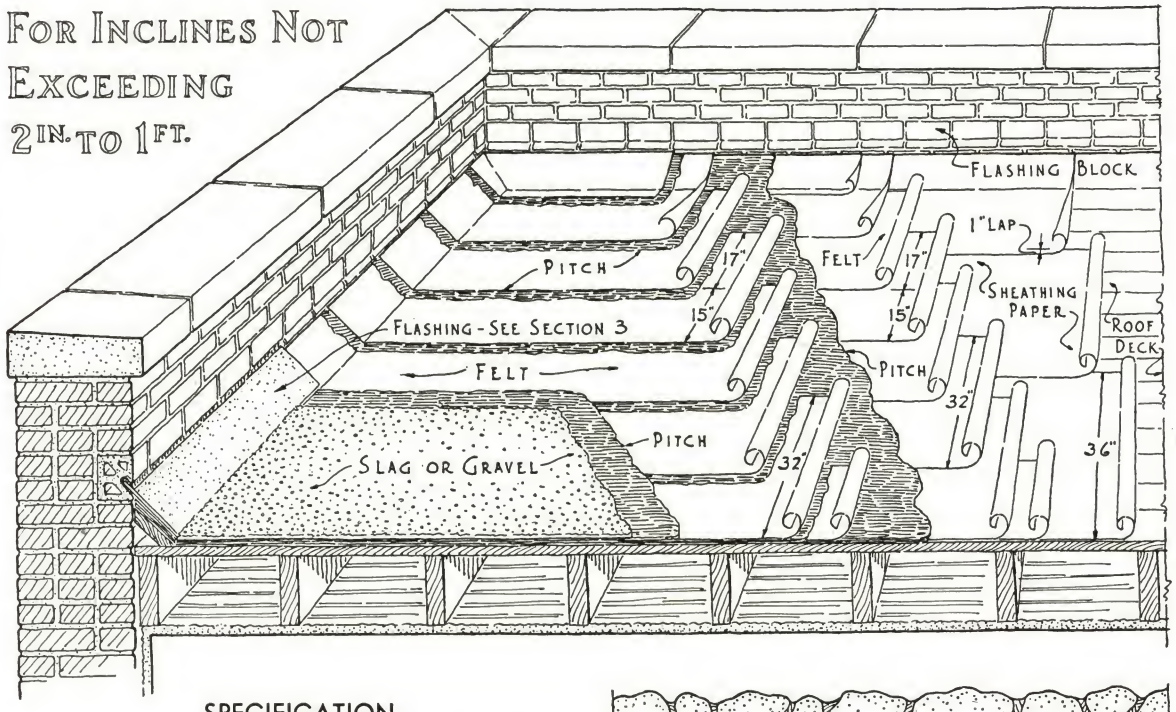
Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over boards), by a roofing contractor approved by The Barrett Company. The roofing contractor shall furnish The Barrett Company's Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note. No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS
15 YEAR GUARANTY BOND TYPE "A"
FOR USE OVER WOOD DECKS



SPECIFICATION

The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knot holes, and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

First—Lay one (1) thickness of sheathing paper or unsaturated Felt, weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

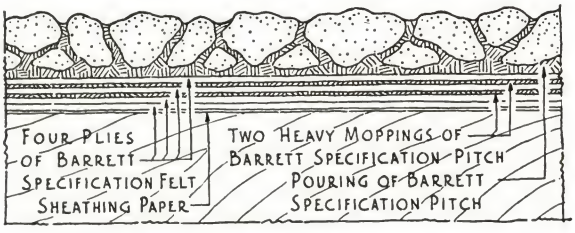
Second—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, and nail as often as is necessary to hold in place until remaining Felt is laid.

Third—Coat the entire surface uniformly with Specification Pitch.

Fourth—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Specification Pitch the full seventeen (17) inch lap on each sheet so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done along the upper edge of each sheet so that all nails will be covered by not less than two (2) plies of Felt.

Fifth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The felt shall be laid without wrinkles or buckles. Not less than one hundred and twenty-five (125) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.



FULL SIZE SECTION

The roof shall be applied by a roofing contractor approved by THE BARRET COMPANY. He shall furnish THE BARRET COMPANY'S Surety Bond Guaranty by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of fifteen (15) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its fifteen (15) year Guaranty Bond on all jobs of five thousand (5,000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over boards), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years, in accordance with Note No. 1 of said specification.

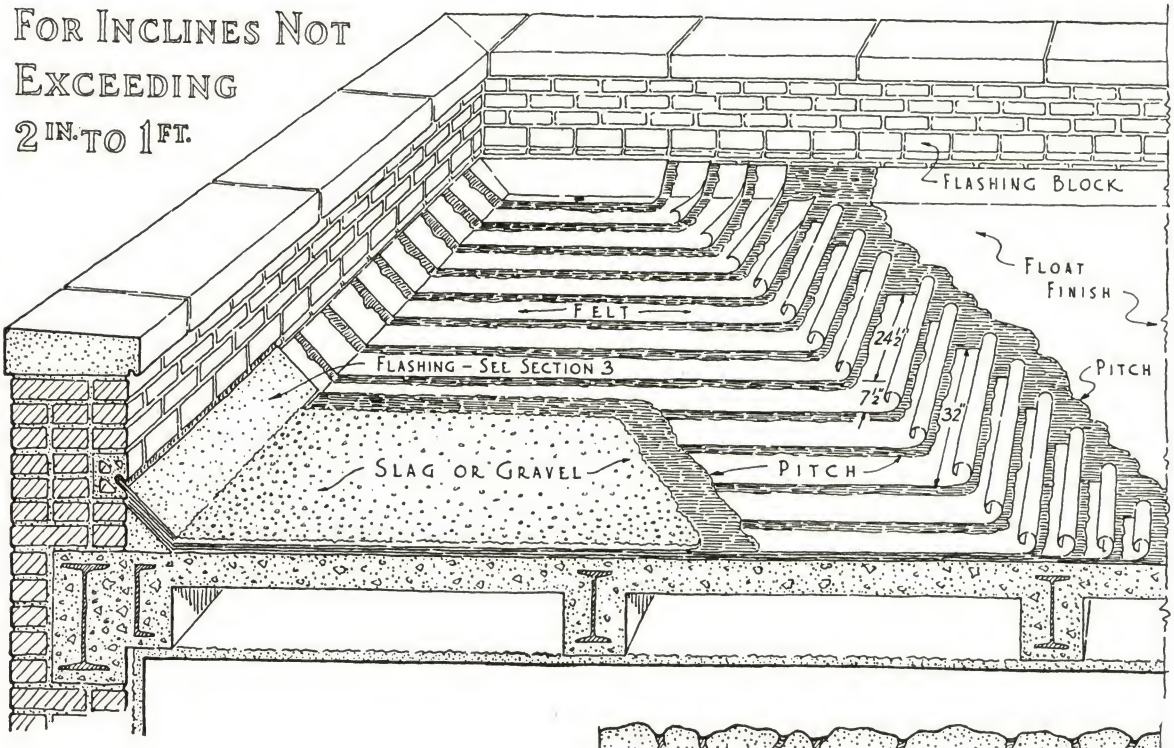
See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS

20 YEAR GUARANTY BOND TYPE "AA"
FOR USE OVER POURED CONCRETE OR GYPSUM

FOR INCLINES NOT EXCEEDING 2 IN. TO 1 FT.



SPECIFICATION

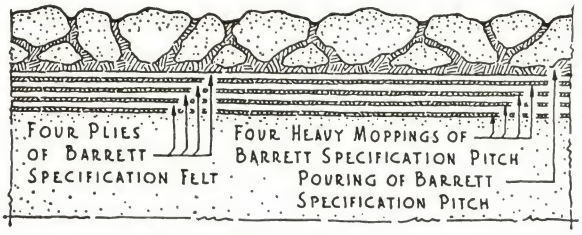
The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets. On inclines exceeding one (1) inch to the foot, roof deck shall permit nailing or wood nailing strips shall be provided.

First—Coat the roof deck uniformly with Specification Pitch.

Second—Over the entire surface lay four (4) plies of Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Specification Pitch the full twenty-four and one-half (24½) inch lap on each sheet, so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done along upper edge of each sheet so that all nails shall be covered by not less than three (3) plies of felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.



FULL SIZE SECTION

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its twenty (20) year Guaranty Bond on all jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over poured concrete or gypsum) by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years, in accordance with Note No. 1 of said specification.

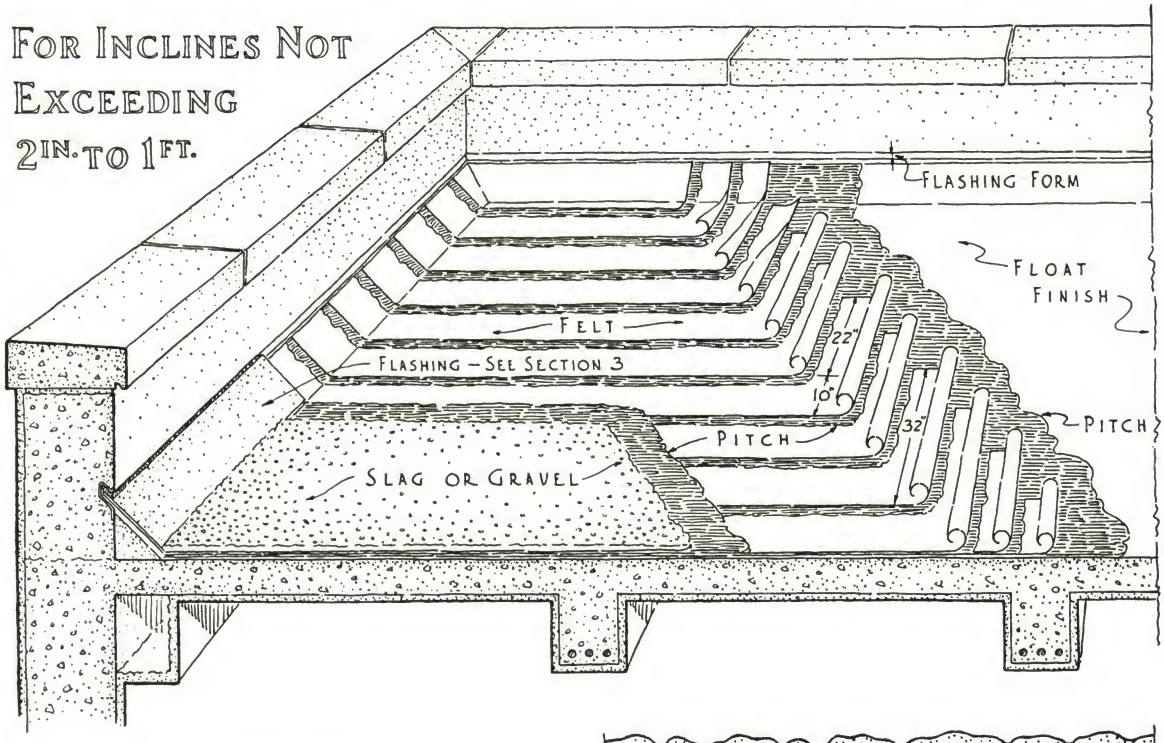
See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS

15 YEAR GUARANTY BOND, TYPE "A"

FOR USE OVER POURED CONCRETE OR GYPSUM



SPECIFICATION

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets. On inclines exceeding one (1) inch to the foot, roof deck shall permit nailing or wood nailing strips shall be provided.

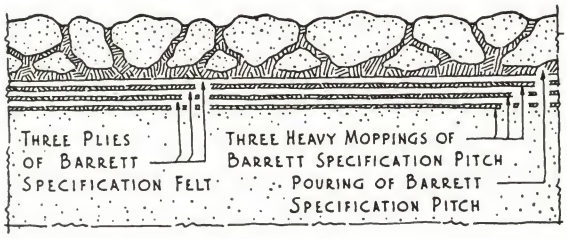
First—Coat the roof deck uniformly with Specification Pitch.

Second—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done along the upper edge of each sheet so that all nails shall be covered by not less than two (2) plies of Felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and seventy-five (175) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degree Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of fifteen (15) years from date of completion, in accordance with Note No. 1.



FULL SIZE SECTION

Note No. 1—THE BARRETT COMPANY will give its fifteen (15) year Guaranty Bond on all jobs of five thousand (5,000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

Condensed Specification

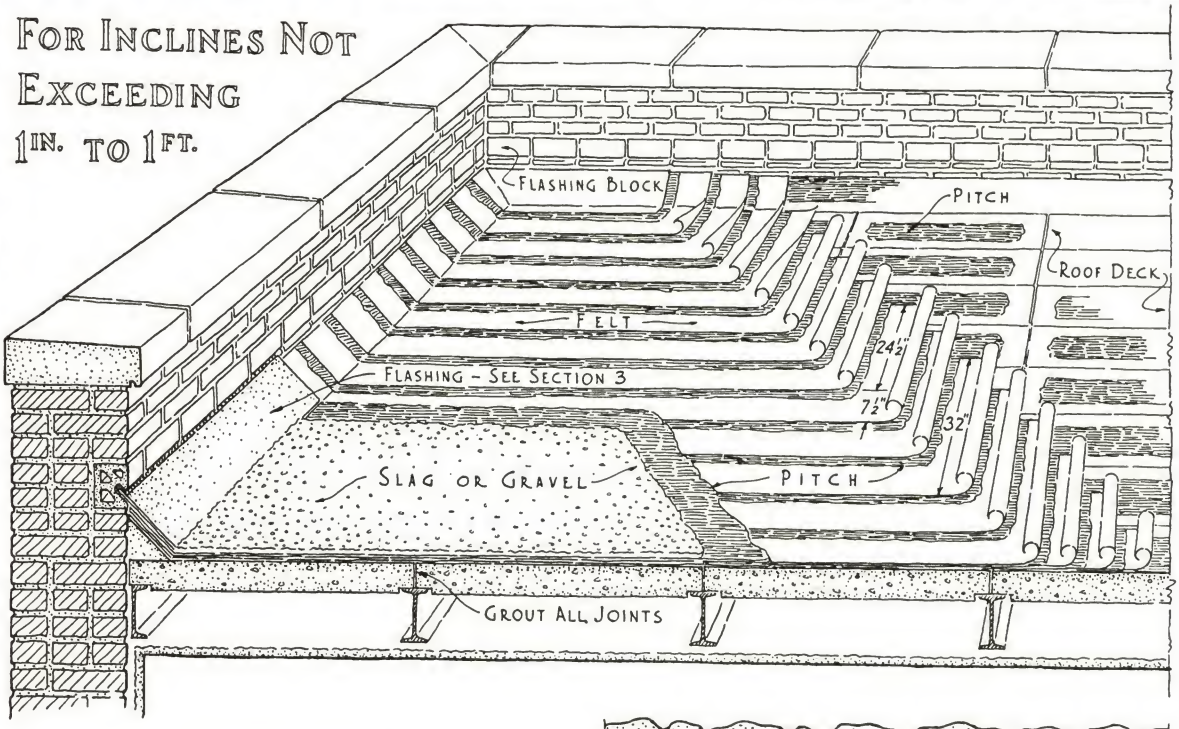
Roofing—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over concrete), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years, in accordance with Note No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS
20 YEAR GUARANTY BOND TYPE "AA"
FOR USE OVER PRECAST CONCRETE SLABS

FOR INCLINES NOT EXCEEDING 1 IN. TO 1 FT.



SPECIFICATION

All joints between concrete slabs shall be properly grouted.

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

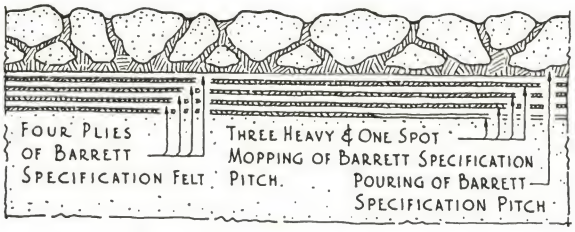
First—Spot or strip mop each slab with Specification Pitch, care being taken that pitch moppings are held back to within four (4) inches from the edge of each joint.

Second—Over the entire surface lay four (4) plies of Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches, over preceding one, mopping with Specification Pitch the full twenty-four and one-half (24½) inch lap on each sheet, so that in no place shall Felt touch Felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.



FULL SIZE SECTION

Note No. 1—THE BARRETT COMPANY will give its twenty (20) year Guaranty Bond on all jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

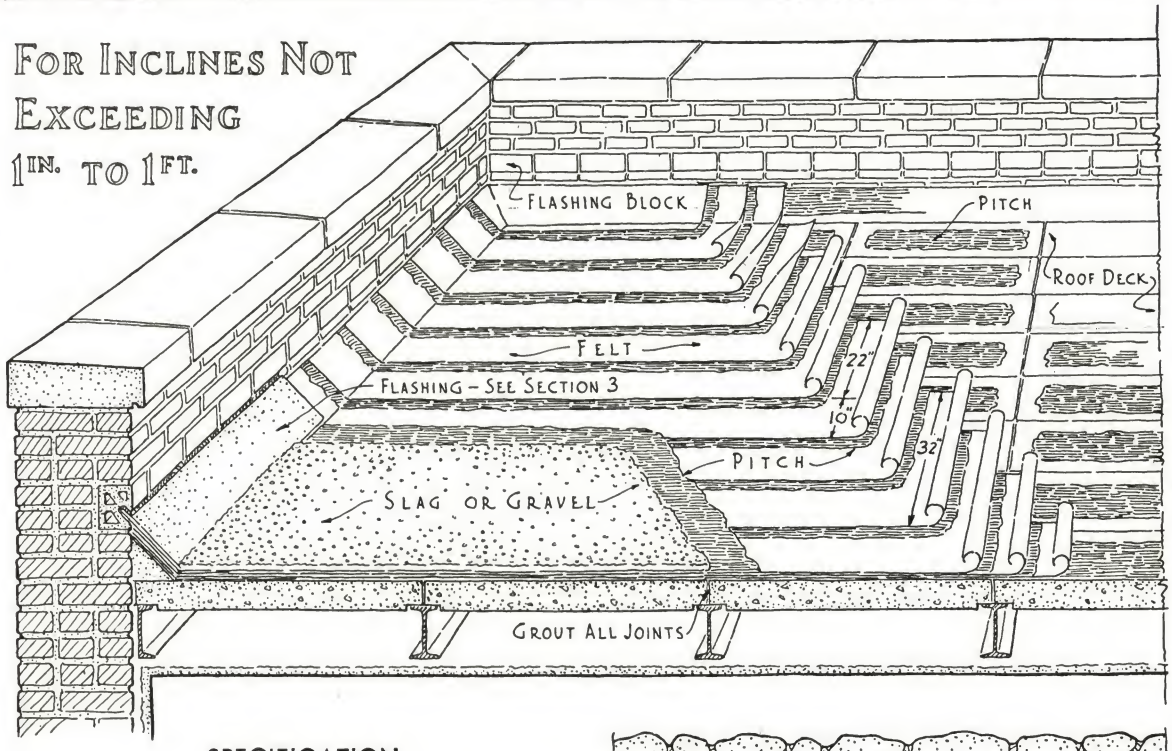
Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over precast concrete slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years, in accordance with Note No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS
15 YEAR GUARANTY BOND TYPE "A"
FOR USE OVER PRECAST CONCRETE SLABS



SPECIFICATION

All joints between concrete slabs shall be properly grouted.

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

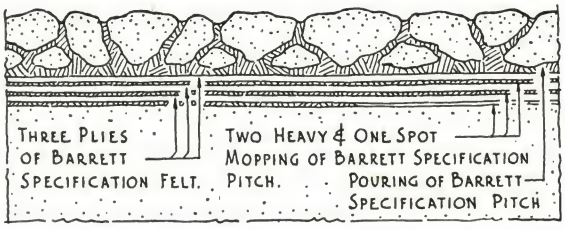
First—Spot or strip mop each slab with Specification Pitch, care being taken that pitch moppings are held back to within four (4) inches from the edge of each joint.

Second—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and seventy-five (175) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish



FULL SIZE SECTION

THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of fifteen (15) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its fifteen (15) year Guaranty Bond on all jobs of five thousand (5,000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

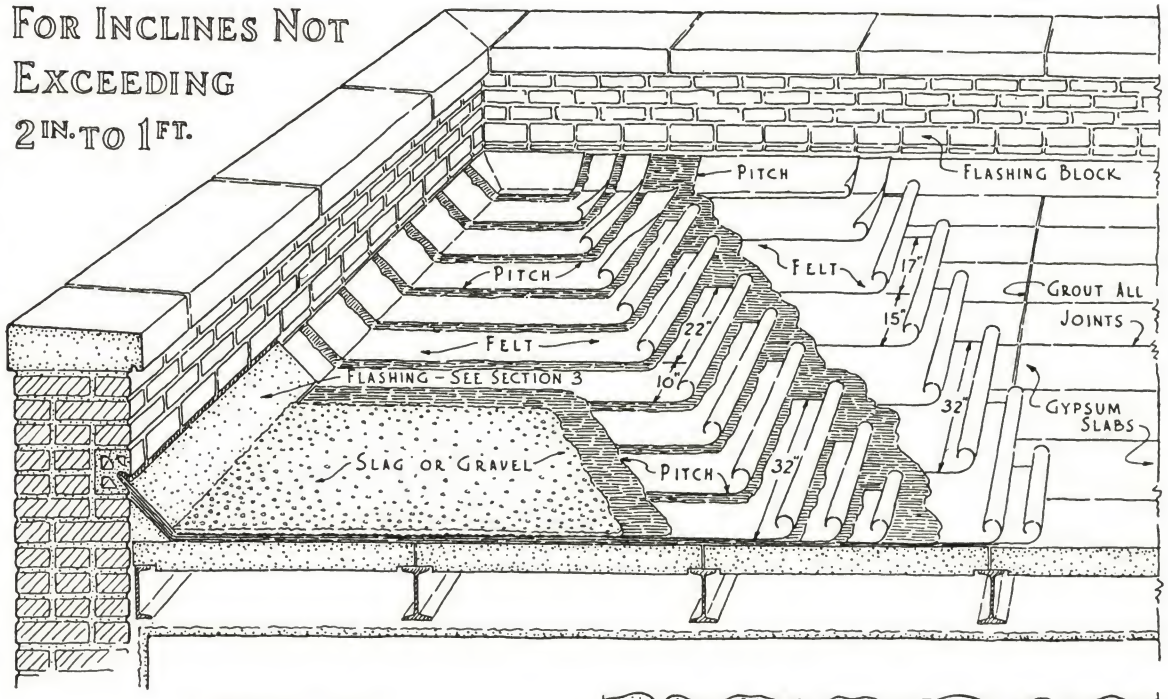
Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over precast concrete slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years, in accordance with Note No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS
20 YEAR GUARANTY BOND TYPE "AA"
FOR USE OVER PRECAST GYPSUM SLABS



SPECIFICATION

All joints between gypsum precast slabs shall be properly grouted.

The roof deck shall be smooth, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

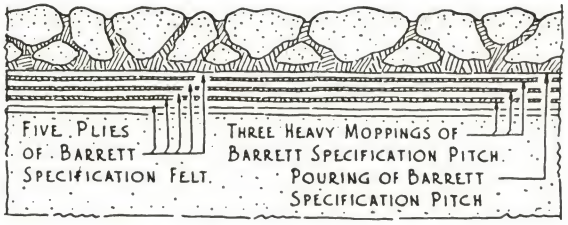
First—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one and nail as often as is necessary to hold in place until remaining Felt is laid.

Second—Coat the entire surface uniformly with Specification Pitch.

Third—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt. Each sheet shall be nailed six (6) inches from the upper edge, nails to be spaced not more than two (2) feet apart. Nails shall not exceed seven-eighths (⅞) inch in length and shall be driven through flat tin disks one (1) inch or more in diameter.

Fourth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and fifty (150) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.



FULL SIZE SECTION

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its twenty (20) year Guaranty Bond on all jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

Condensed Specification

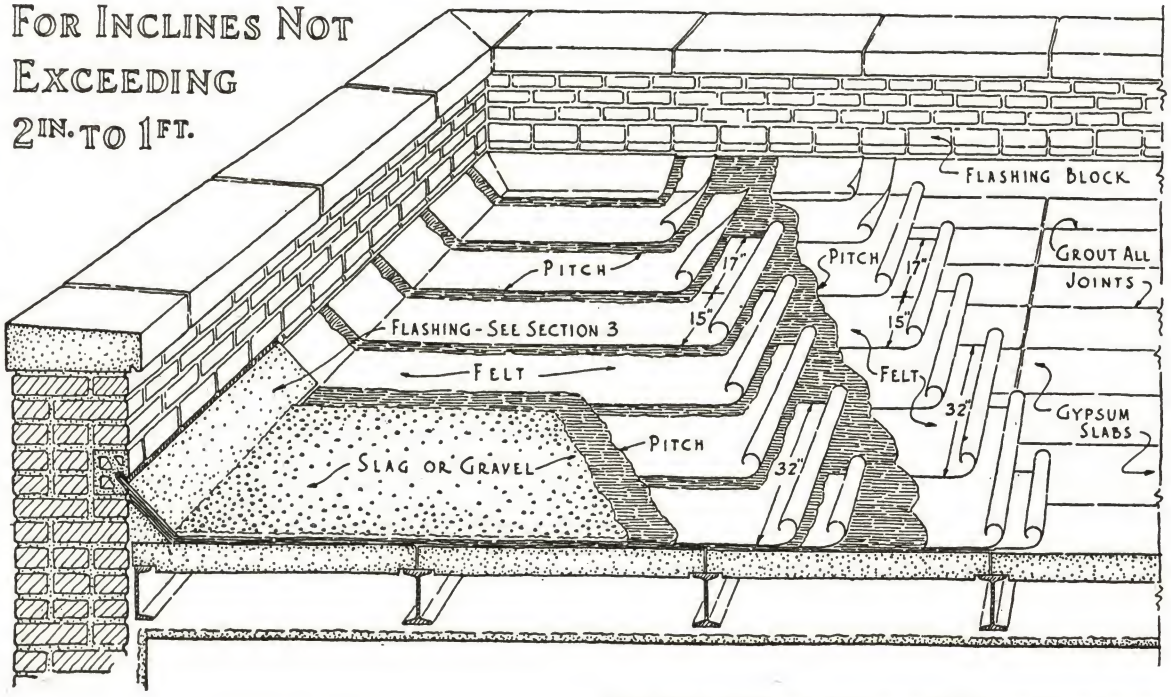
Roofing—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over precast gypsum slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years, in accordance with Note No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS
15 YEAR GUARANTY BOND, TYPE "A"
FOR USE OVER PRECAST GYPSUM SLABS

FOR INCLINES NOT EXCEEDING 2 IN. TO 1 FT.



SPECIFICATION

All joints between gypsum precast slabs shall be properly grouted.

The roof deck shall be smooth, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

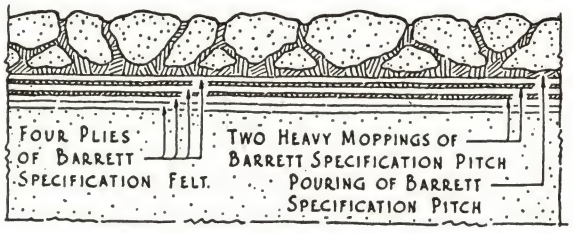
First—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, and nail as often as is necessary to hold in place until remaining Felt is laid.

Second—Coat the entire surface uniformly with Specification Pitch.

Third—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Specification Pitch the full seventeen (17) inch lap on each sheet so that in no place shall Felt touch Felt. Each sheet shall be nailed six (6) inches from the upper edge, nails to be spaced not more than two (2) feet apart. Nails shall not exceed seven-eighths (⅞) inch in length and shall be driven through flat tin disks one (1) inch or more in diameter.

Fourth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and twenty-five (125) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.



FULL SIZE SECTION

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of fifteen (15) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its fifteen (15) year Guaranty Bond on all jobs of five thousand (5,000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

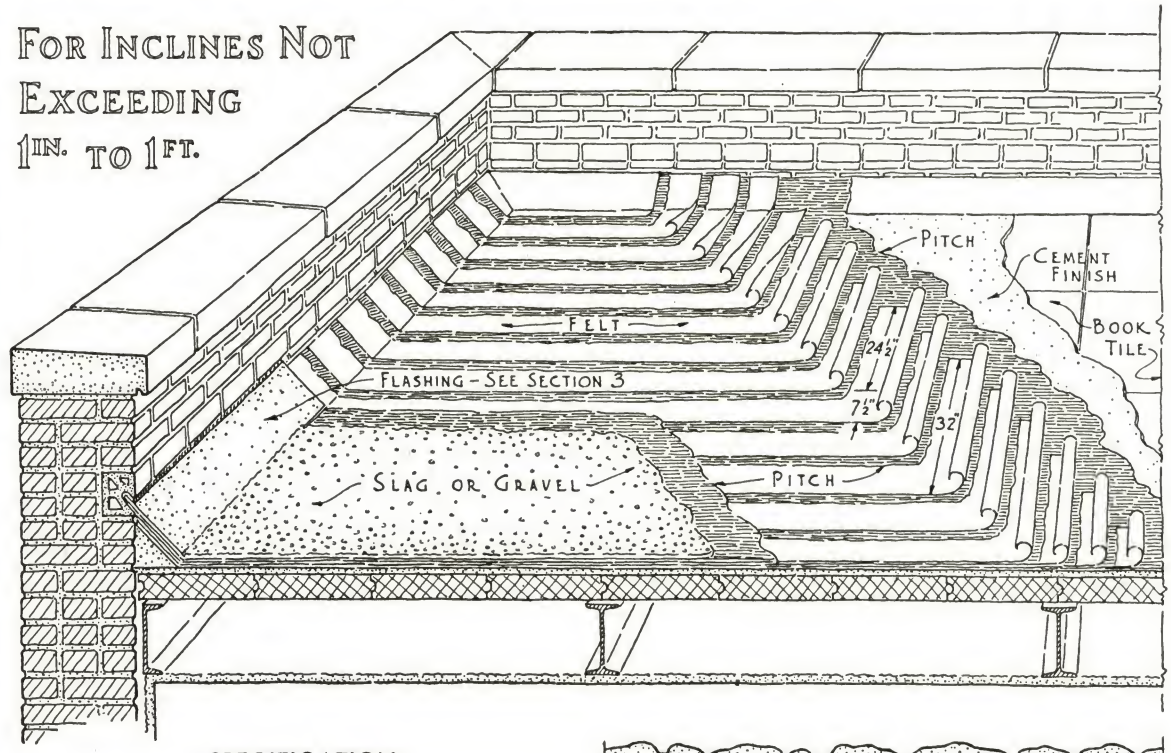
Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over precast gypsum slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years, in accordance with Note No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS
20 YEAR GUARANTY BOND TYPE "AA"
FOR USE OVER BOOK TILE



SPECIFICATION

The surface of the book tile shall be finished off with not less than one-half (½) inch of Portland cement mortar.

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

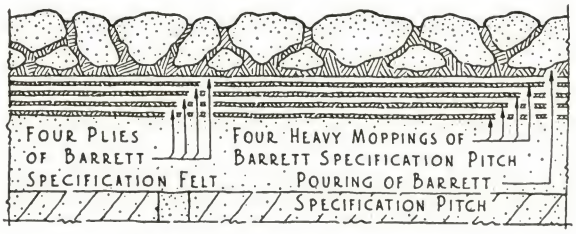
First—Coat the entire surface of the roof deck uniformly with Specification Pitch.

Second—Over the entire surface lay four (4) plies of Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Specification Pitch the full twenty-four and one-half (24½) inches on each sheet, so that in no place shall Felt touch Felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion.



FULL SIZE SECTION

Note No. 1—THE BARRETT COMPANY will give its twenty (20) year Guaranty Bond on all jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY, in strict accordance with the above specification and subject to Barrett inspection and approval.

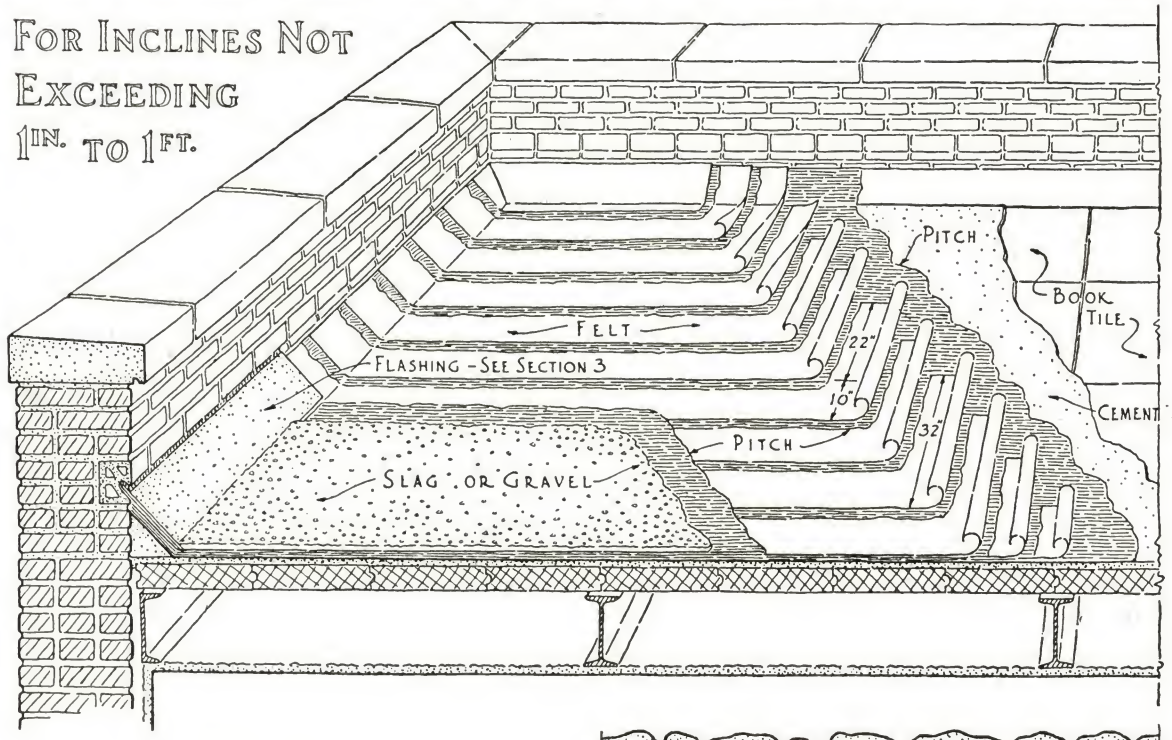
Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over book tile), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years in accordance with Note No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

BARRETT SPECIFICATION ROOFS
15 YEAR GUARANTY BOND TYPE "A"
FOR USE OVER BOOK TILE



SPECIFICATION

The surface of the book tile shall be finished off with not less than one-half (½) inch of Portland cement mortar.

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

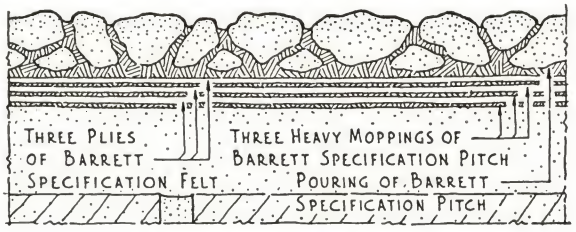
First—Coat the entire surface of the roof deck uniformly with Specification Pitch.

Second—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches, over preceding one, mopping with Specification Pitch the full twenty-two (22) inches on each sheet so that in no place shall Felt touch Felt.

Third—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

General—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and seventy-five (175) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of fifteen (15) years from date of completion, in accordance with Note No. 1.



FULL SIZE SECTION

Note No. 1—THE BARRETT COMPANY will give its fifteen (15) year Guaranty Bond on all jobs of five thousand (5,000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY, in strict accordance with the above specification and subject to Barrett inspection and approval.

Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over book tile), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years in accordance with Note No. 1 of said specification.

See Section No. 3 for Specifications and Details on Flashings.

Barrett

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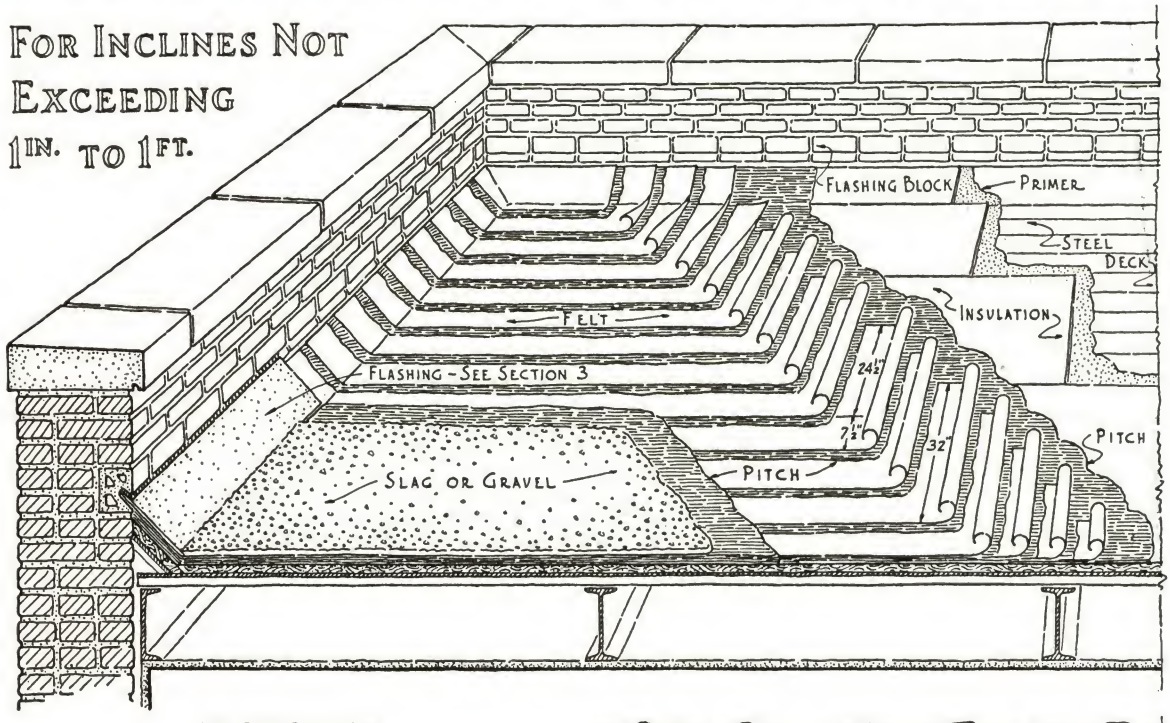
BARRETT SPECIFICATION ROOFS
20 YEAR GUARANTY BOND TYPE "AA"
FOR USE OVER STEEL DECKS



SPECIFICATION

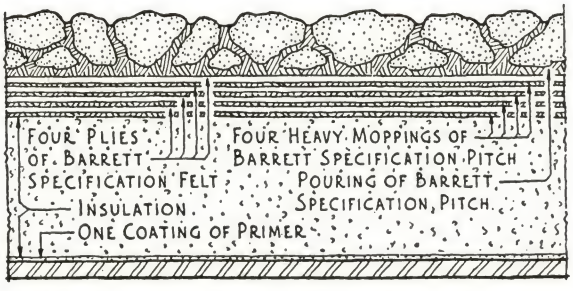
The roof deck shall be smooth, firm, dry and free from rust, grease or loose material. The weather surface shall be factory-primed to receive the roof covering. If roof deck is inclined it shall be properly graded to outlets.

First—Over the entire surface spread a uniform coating of Barrett Anchor Brand Roofing Asphalt into which, while hot, embed approved rigid roof insulation as specified. Insulation shall be kept and applied in a dry condition and shall be firm and free from defects or loose materials. Cut-offs consisting of two (2) plies of Specification Tarred Felt and three (3) moppings of Barrett Anchor Brand Roofing Asphalt shall be applied every twenty (20) feet, during the application of the insulation, and such cut-offs shall extend at least six (6) inches on roof deck and four (4) inches on top of insulation. No more insulation shall be applied than can be immediately covered with roofing. Care shall be taken that all ends are properly flashed so that at no time shall surface or edges of insulation be exposed.

Second—Coat the entire surface of the insulation with Specification Pitch.

Third—Over the entire surface lay four (4) plies of Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Specification Pitch the full twenty-four and one-half (24½) inch lap, so that in no place shall Felt touch Felt. Each sheet shall be nailed three (3) inches from upper edge, with soft nosed nails of sufficient length to extend through the insulation and clinch. Nails to be spaced not more than two (2) feet apart.

Fourth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, in which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.



General—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees F.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

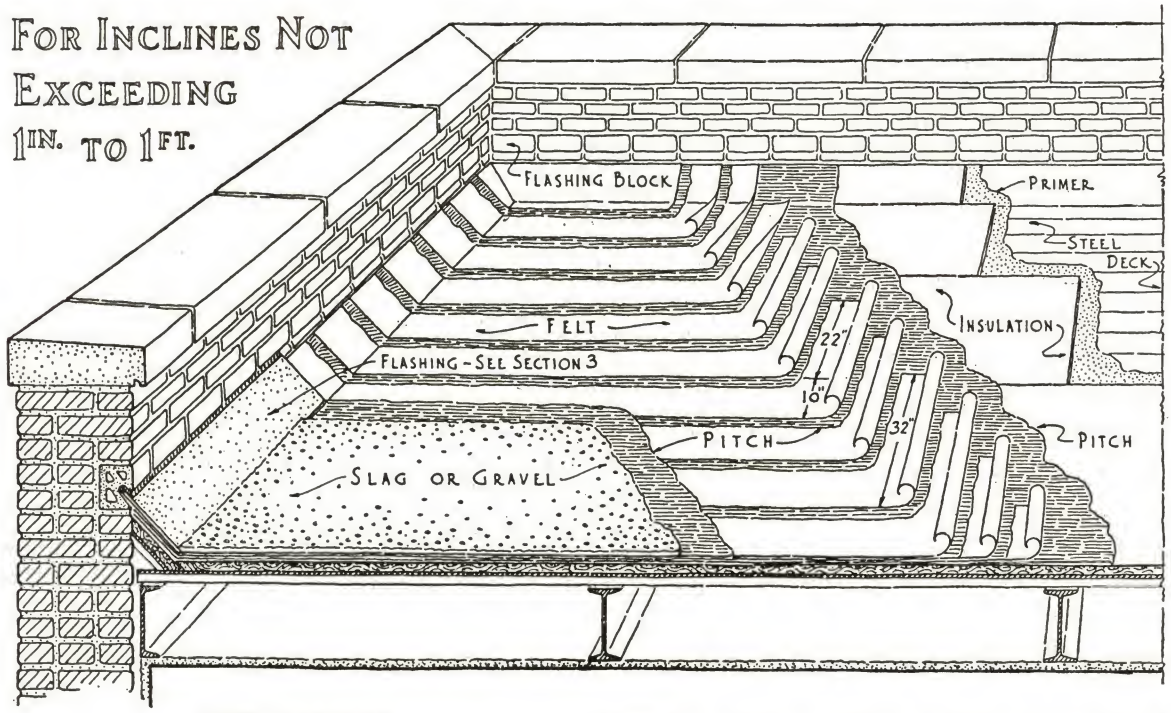
Note No. 1—THE BARRETT COMPANY will give its twenty (20) year Guaranty Bond on all jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY, in strict accordance with the above specification and subject to Barrett inspection and approval.

Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification for use over steel roof decks, by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years, in accordance with Note No. 1 of said specification.

Barrett

BARRETT SPECIFICATION ROOFS
15 YEAR GUARANTY BOND TYPE "A"
FOR USE OVER STEEL DECKS



SPECIFICATION

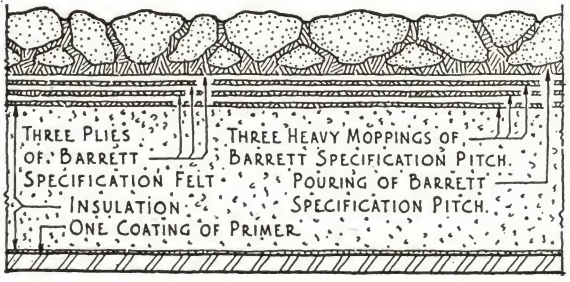
The roof deck shall be smooth, firm, dry and free from rust, grease, or loose material. The weather surface shall be factory-primed to receive the roof covering. If roof deck is inclined it shall be properly graded to outlets.

First—Over the entire surface spread a uniform coating of Barrett Anchor Brand Roofing Asphalt into which, while hot, embed approved rigid roof insulation as specified. Insulation shall be kept and applied in a dry condition and shall be firm and free from defects or loose materials. Cut-offs consisting of two (2) plies of Specification Tarred Felt and three (3) moppings of Barrett Anchor Brand Roofing Asphalt shall be applied every twenty (20) feet, during the application of the insulation, and such cut-offs shall extend at least six (6) inches on roof deck and four (4) inches on top of insulation. No more insulation shall be applied than can be immediately covered with roofing. Care shall be taken that ends are properly flashed so that at no time shall surface or edges of insulation be exposed.

Second—Coat the entire surface of the insulation with Specification Pitch.

Third—Over the entire surface lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Specification Pitch the full twenty-two (22) inch lap, so that in no place shall felt touch felt. Each sheet shall be nailed three (3) inches from the upper edge with soft-nosed nails of sufficient length to extend through the insulation and clinch. Nails to be spaced not more than two (2) feet apart.

Fourth—Over the entire surface pour from a dipper a uniform coating of Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.



General—The felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees F.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of fifteen (15) years from date of completion, in accordance with Note No. 1.

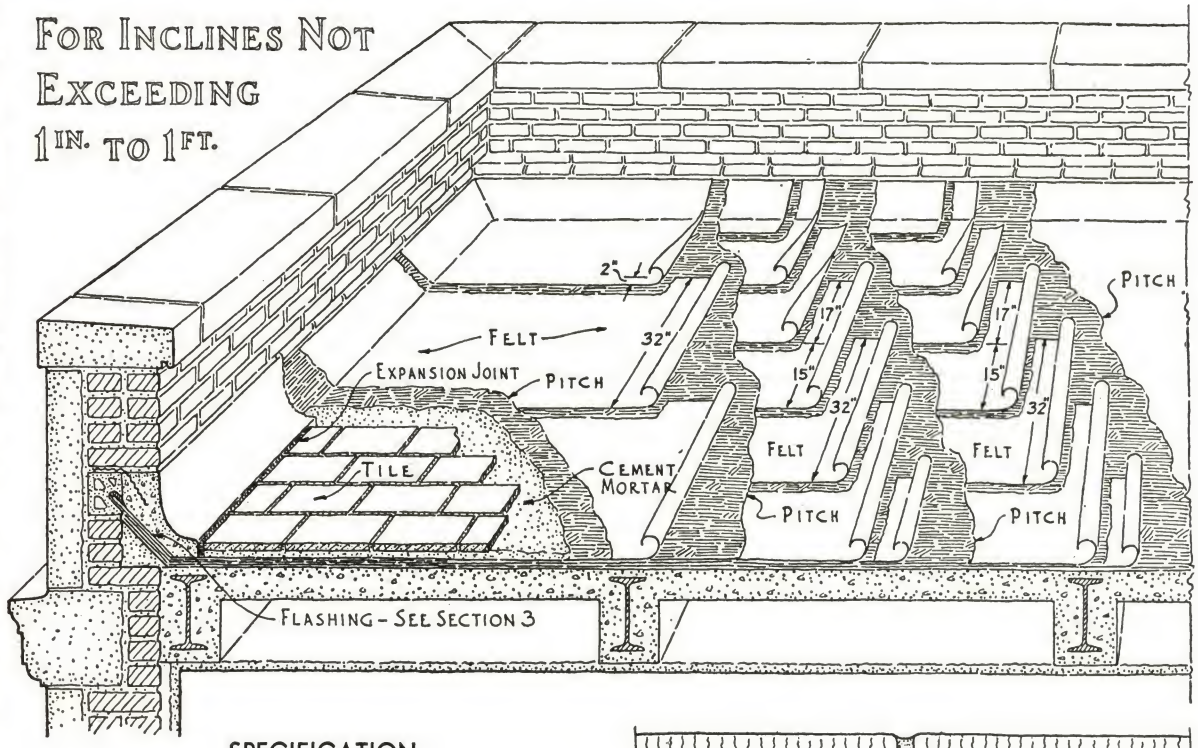
Note No. 1—THE BARRETT COMPANY will give its fifteen (15) year Guaranty Bond on all jobs of five thousand (5,000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

Condensed Specification

Roofing—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification for use over steel roof decks, by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years, in accordance with Note No. 1 of said specification.

Barrett

BARRETT SPECIFICATION ROOFS
5-PLY OVER CONCRETE
FOR USE UNDER PROMENADE TILE



SPECIFICATION

The roof deck shall be smooth, firm, dry, properly graded to outlets, and free from loose material.

First—Coat the concrete uniformly with Specification Pitch.

Second—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Specification Pitch the full seventeen (17) inch lap on each sheet, so that in no place shall Felt touch Felt.

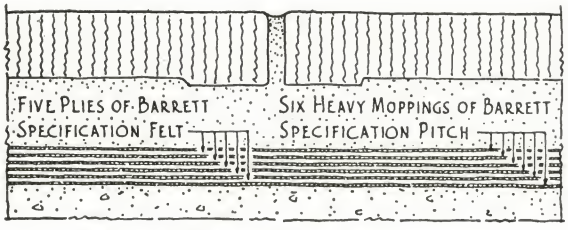
Third—Coat the entire surface uniformly with Specification Pitch.

Fourth—Over the entire surface lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Specification Pitch the full seventeen (17) inch lap on each sheet, so that in no place shall Felt touch Felt.

Fifth—Immediately preceding the laying of the tile, thoroughly clean the surface of the roof and mop same with Specification Pitch, into which, while hot, embed one (1) layer of Specification Felt, lapping each sheet two (2) inches over preceding one. Over this surface and immediately preceding the laying of the tile spread a heavy uniform coating of Specification Pitch. No more of the roof surface shall be covered with the final or last ply of Felt and mopping of Pitch than is covered at the same time with tile and is necessary to allow for proper connections.

Over the Felt and Pitch roofing thus laid, 1 x 6 x 9-inch vitrified clay tile (approved by the architect) shall be set in not less than three-fourths (¾) inch of Portland cement mortar (1 to 3 mix) and joints grouted full with Portland cement mortar (1 to 2 mix). The tile shall be laid to show three-sixteenths (3/16) inch to one-fourth (¼) inch joints. Expansion joints three-fourths (¾) inch wide filled with a plastic mixture (approved by the architect) shall be provided between the tile and all flashings, and either metal or mastic expansion joints shall be provided throughout the roof surface as may be necessary to take care of expansion. All expansion joints shall extend from the top of the tile through the cement mortar to the Felt and Pitch waterproofing and in no case shall expansion joints be spaced more than twenty (20) feet apart.

General—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit. The roofing contract shall be awarded to a roofing contractor, approved by The Barrett Company, who has had experience in this kind of work, and who can refer to similar roofing where his work has proved satisfactory.



HALF FULL SIZE SECTION

See Section No. 3 for Specifications and Details on Flashing.

Barrett

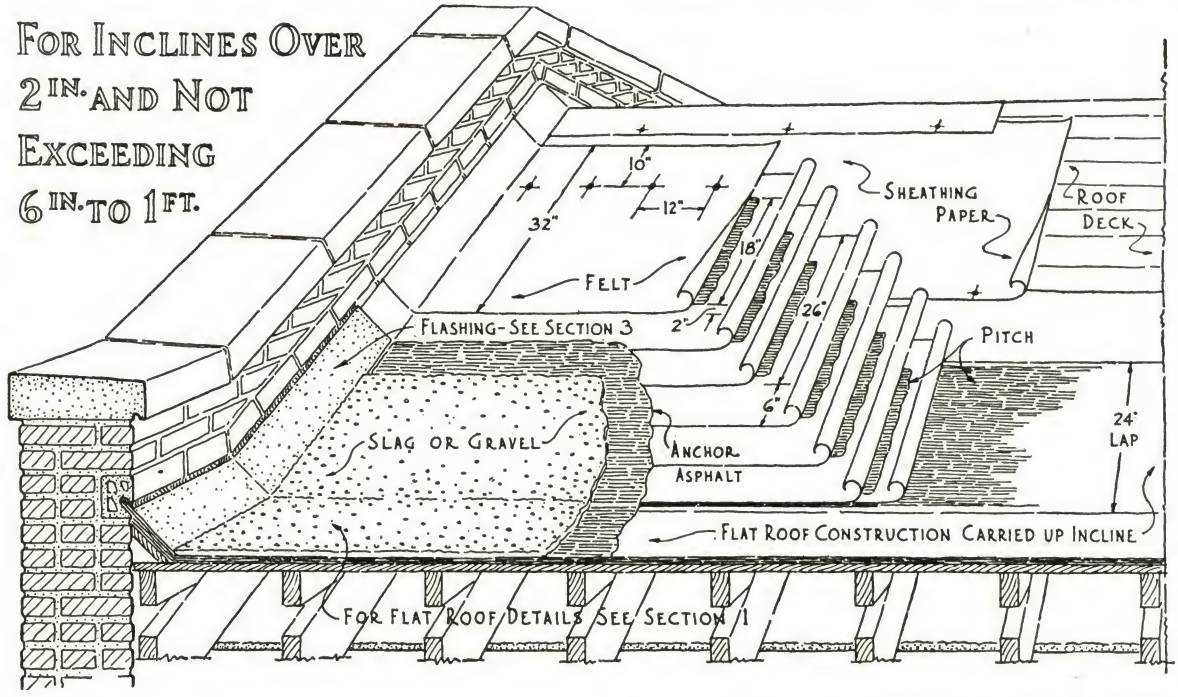
SECTION II

Steep Roof Specifications

and

Details

BARRETT SPECIAL STEEP ROOFS
10 YEAR GUARANTY BOND – 5 PLY
FOR USE OVER WOOD



SPECIFICATION

The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knot holes, and free from loose material.

First—Lay one (1) thickness of sheathing paper or unsaturated felt weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

Second—Over the entire surface lay five (5) plies of Specification Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-six (26) inches over preceding one. Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin disks, ten (10) inches from the upper edge, nails to be spaced not more than one (1) foot apart.

Third—Mop back on each sheet for a distance of twenty (20) inches with Specification Pitch. Care shall be taken that pitch moppings are held back two (2) inches from the lower edge of each sheet, and that the finished felt surface shall be free of pitch drippage from the mopping bucket.

Fourth—Over the entire surface spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, in which, while hot, embed not less than two hundred and fifty (250) pounds of slag for each one hundred (100) square feet. The slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, dry and free from dirt. If roofing is applied during cool weather, or slag is damp, it shall be heated and dried. The slag shall be warm when applied to the roof. The finished surface shall be broomed clean of all loose slag.

General—Felt shall be laid without wrinkles or buckles. Not less than sixty (60) pounds of pitch and not less than forty (40), nor more than fifty (50), pounds of asphalt shall be used for constructing each one hundred (100) square feet of completed roof. The pitch and asphalt shall not be heated above four hundred (400) degrees Fahrenheit.

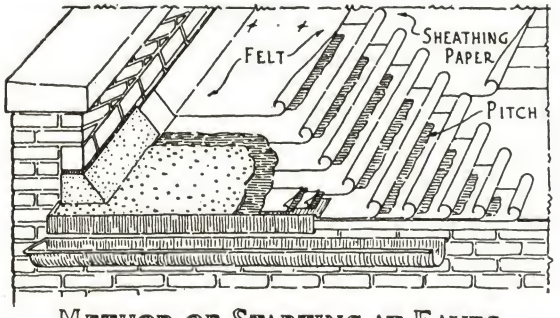
Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of ten (10) years from date of completion in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its ten year Guaranty Bond on jobs in the United States and Canada where its inspection service is available provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" roof.

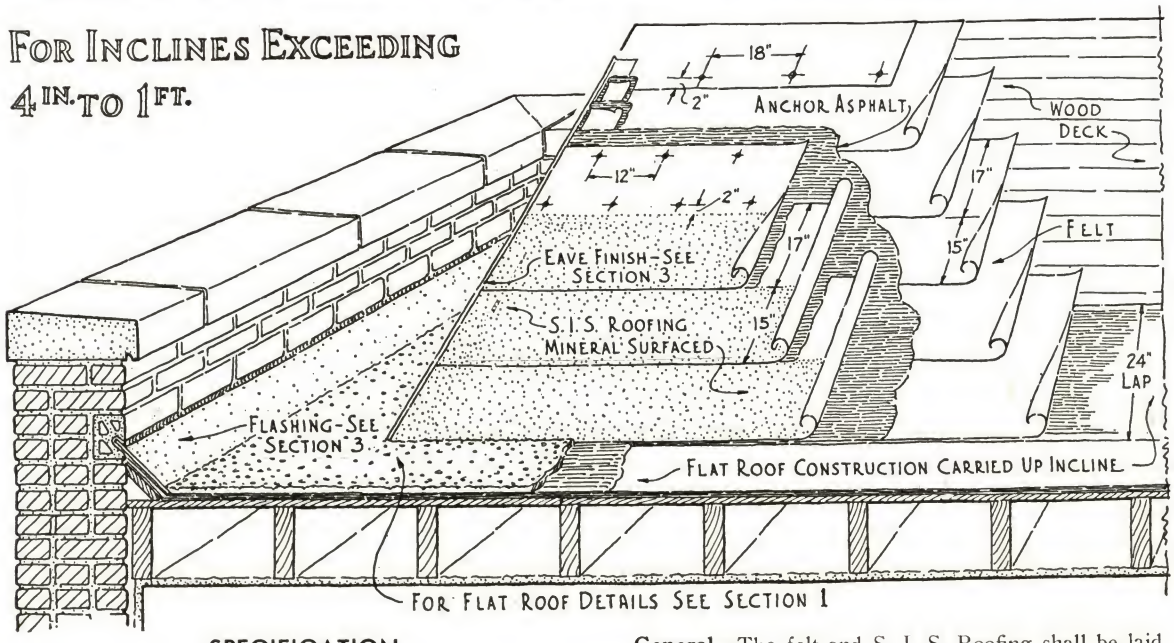


METHOD OF STARTING AT EAVES

Barrett

BARRETT SPECIAL STEEP ROOFS
S.I.S. TYPE 10 YEAR GUARANTY BOND
FOR USE OVER WOOD

FOR INCLINES EXCEEDING 4 IN. TO 1 FT.



SPECIFICATION

The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knot holes, and free from loose material.

First—Over the entire surface lay two (2) plies of Specification Tarred Felt at right angles to the incline of the roof, lapping each sheet seventeen (17) inches over preceding one. Each sheet shall be nailed two (2) inches from the lower edge with barbed roofing nails, through flat tin disks, spacing the nails not more than eighteen (18) inches apart.

Second—Over the entire surface spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled Barrett S. I. S. Roofing laid at right angles to the incline of the roof, lapping the sheets the full width of the seventeen (17) inch selvage. All sheets of Barrett S. I. S. Roofing shall be securely fastened in place with a double course of one (1) inch barbed roofing nails driven through flat tin disks, and placed along the selvage side of the sheet. Nailing courses to be staggered and nails to be spaced not more than twelve (12) inches apart. The lower nailing course shall be held back two (2) inches from the mineral surfacing.

Third—Spread over the entire surface of the seventeen (17) inch selvage a uniform mopping of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled the following sheet of Barrett S. I. S. Roofing.

Fourth—All end laps shall be over-lapped at least six (6) inches. The underlying sheet of each end lap shall be nailed with six (6) nails through flat tin disks spaced five (5) inches apart starting one (1) inch from the lower edge of the sheet. The six (6) inch lap shall be coated with Barrett Anchor Brand Roofing Asphalt and the over-lapping sheet thoroughly pressed down.

Fifth—The Barrett S. I. S. Roofing shall be cut in strips not to exceed twenty (20) feet in length and shall be stacked flat in piles at least twenty-four (24) hours before using.

General—The felt and S. I. S. Roofing shall be laid without wrinkles or buckles. Not less than fifty (50) pounds of Barrett Anchor Brand Roofing Asphalt shall be used for constructing each one hundred (100) square feet of completed roof.

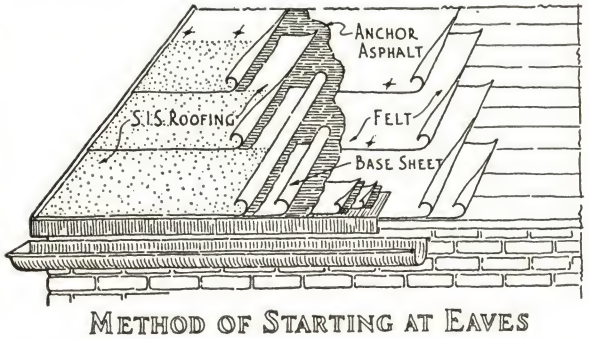
Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of ten (10) years from date of completion in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its ten year Guaranty Bond on jobs in the United States and Canada where its inspection service is available provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" roof.



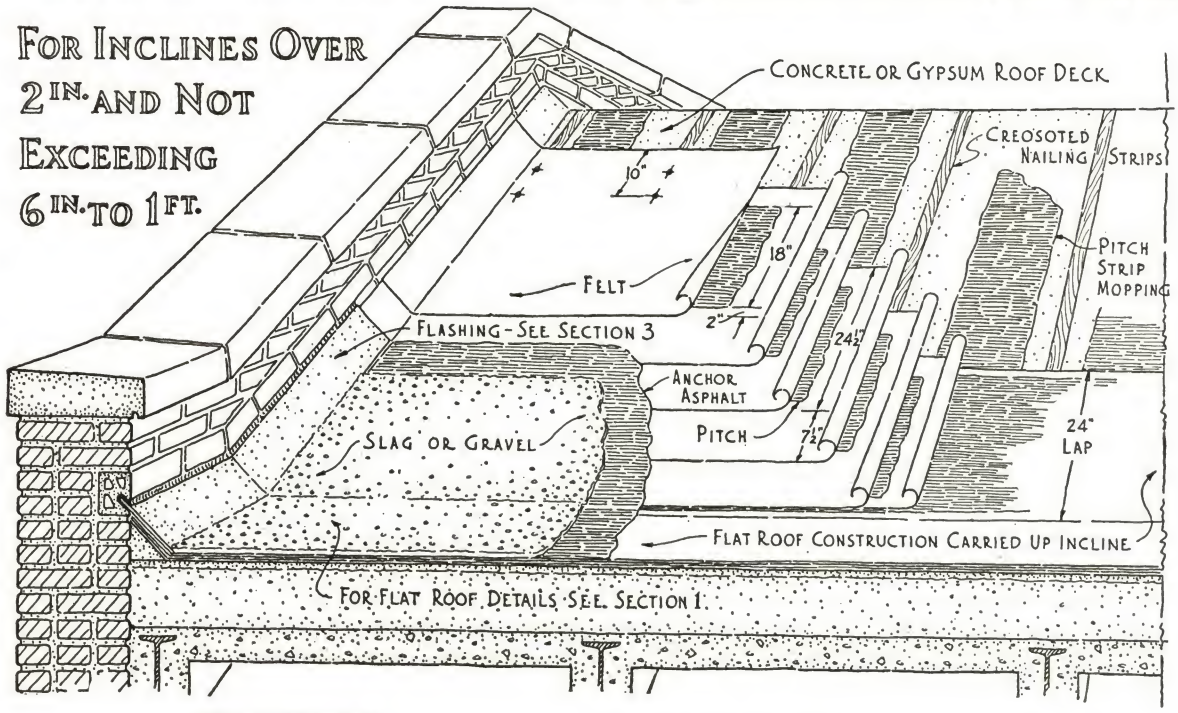
METHOD OF STARTING AT EAVES

Barrett

BARRETT SPECIAL STEEP ROOFS

10 YEAR GUARANTY BOND — 4 PLY

FOR USE OVER POURED CONCRETE OR GYPSUM



SPECIFICATION

The roof deck shall be smooth, firm, dry and free from loose material. The concrete or gypsum shall permit of nailing or creosoted wooden nailing strips shall be provided. If nailing strips are provided, they shall be laid parallel with the incline of the roof and shall be spaced not more than three (3) feet apart.

First—Strip mop the surface of the concrete/or gypsum deck with Specification Pitch. Strip moppings shall run parallel with the incline of the roof and shall be not less than twelve (12) inches, nor more than eighteen (18) inches wide. The distance between each shall not exceed double the width of the mopping.

Second—Over the entire surface lay four (4) plies of Specification Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-four and one-half (24½) inches over preceding one. Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin disks ten (10) inches from the upper edge, nails to be spaced not more than one (1) foot apart. If nailing strips are used, the felt shall be nailed with two (2) nails, through flat tin disks (at each nailing strip) placed eight (8) and ten (10) inches respectively from the upper edge of each sheet.

Third—Mop back on each sheet for a distance of twenty (20) inches with Specification Pitch. Care shall be taken so that pitch moppings are held back two (2) inches from the lower edge of each sheet and that the finished felt surface shall be free of pitch drippage from the mopping bucket.

Fourth—Over the entire surface spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, embed not less than two hundred fifty (250) pounds of slag for each one hundred (100) square feet. The slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, dry and free from dirt. If roofing is applied during cool weather, or slag is damp, it shall be heated and dried. The slag shall be warm when applied to the roof. The finished surface shall be broomed clean of all loose slag.

General — Felt shall be laid without wrinkles or buckles. Not less than sixty-five (65) pounds of pitch and not less than forty (40), nor more than fifty (50), pounds of asphalt shall be used for constructing each one hundred (100) square feet of completed roof. The pitch and asphalt shall not be heated above four hundred (400) degrees F.

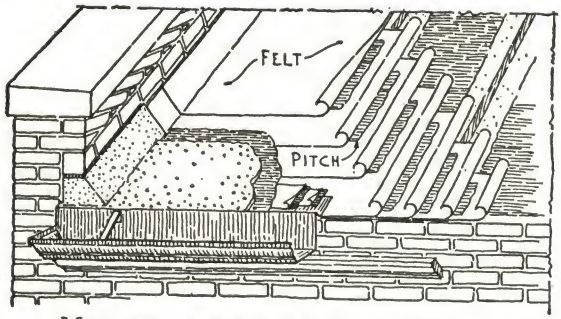
Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before application of steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company of Baltimore, covering a period of ten (10) years from date of completion in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its ten year Guaranty Bond on jobs in the United States and Canada where its inspection service is available provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area be roofed in conjunction with the flat roof area.

(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" roof.



METHOD OF STARTING AT EAVES

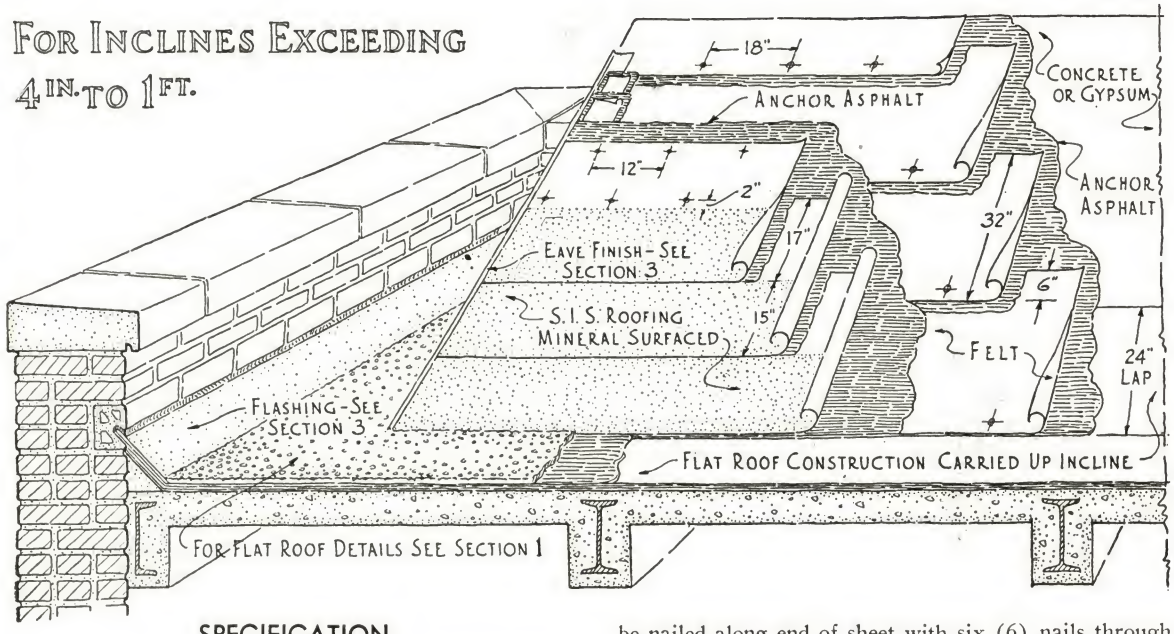
Barrett

BARRETT SPECIAL STEEP ROOFS

S.I.S. TYPE - 10 YEAR GUARANTY BOND

FOR USE OVER POURED CONCRETE OR GYPSUM

FOR INCLINES EXCEEDING 4 IN. TO 1 FT.



SPECIFICATION

The roof deck shall be smooth, firm, dry and free from loose material. The concrete or gypsum shall permit of nailing or creosoted wooden nailing strips shall be provided. If nailing strips are provided, they shall be laid parallel with the incline of the roof and shall be spaced not more than three (3) feet apart.

First—The surface of the roof deck shall be given a priming coat of Barrett Crystal Asphalt Primer. The priming coat shall be allowed to dry for not less than six (6) hours before the application of the roofing.

Second—Over the roof deck spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately embedded one (1) ply of Specification Tarred Felt, laid at right angles to the incline of the roof, lapping each sheet six (6) inches over preceding one. The six (6) inch over-lap shall be thoroughly cemented together with Barrett Anchor Brand Roofing Asphalt. The felt shall be nailed two (2) inches from the lower edge of each sheet, with barbed roofing nails through flat tin disks, spaced not more than eighteen (18) inches apart.

Third—Over the entire surface spread a uniform mopped coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled Barrett S. I. S. Roofing laid at right angles to incline of roof, lapping the sheets the full width of the seventeen (17) inch selvage. All sheets of S. I. S. Roofing shall be securely fastened in place with a double course of one (1) inch barbed roofing nails driven through flat tin disks, and placed along the selvage side of sheet. Nailing courses to be staggered and nails spaced not more than twelve (12) inches apart. Lower nailing course shall be held back two (2) inches from the mineral surfacing.

Fourth—Spread over the entire surface of the seventeen (17) inch selvage, a uniform mopping of Barrett Anchor Brand Roofing Asphalt, into which shall be immediately rolled the following sheet of S. I. S. Roofing.

Fifth—All end laps shall be over-lapped at least six (6) inches. The underlying sheet of each end lap shall be nailed along end of sheet with six (6) nails through flat tin disks spaced evenly. The six (6) inch lap shall be coated with Barrett Anchor Brand Roofing Asphalt and the over-lapping sheet thoroughly pressed down.

Sixth—S. I. S. Roofing shall be cut in strips not to exceed twenty (20) feet in length and shall be stacked flat in piles at least twenty-four (24) hours before using.

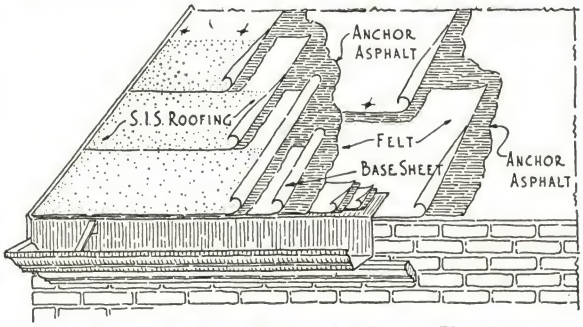
General—The felt and S. I. S. Roofing shall be laid without wrinkles or buckles. Not less than one hundred (100) pounds of Barrett Anchor Brand Roofing Asphalt shall be used for constructing each one hundred (100) square feet of completed roof. Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company of Baltimore, covering a period of ten (10) years from date of completion.

Note No. 1—THE BARRETT COMPANY will give its ten year Guaranty Bond on jobs in the United States and Canada where its inspection service is available provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval under the following conditions:

(a) That steep roof area be roofed in conjunction with flat area.

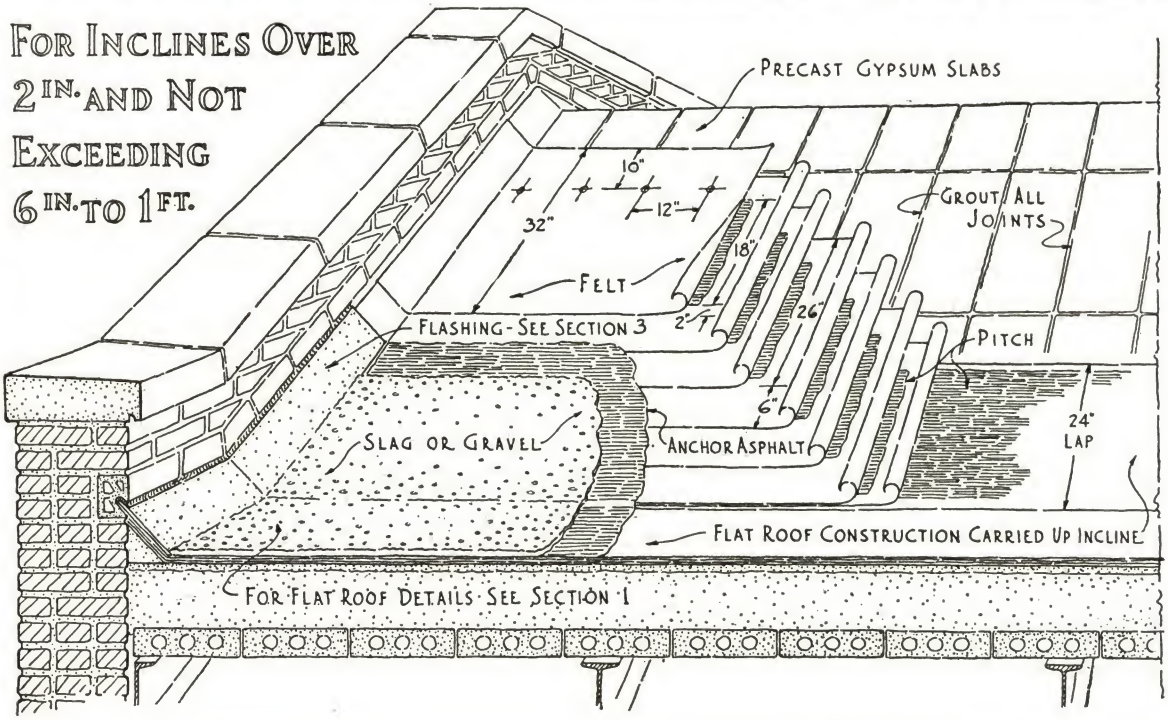
(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" roof.



METHOD OF STARTING AT EAVES

Barrett

BARRETT SPECIAL STEEP ROOFS
10 YEAR GUARANTY BOND — 5 PLY
FOR USE OVER PRECAST GYPSUM SLABS



SPECIFICATION

All joints between precast gypsum slabs shall be properly grouted. The roof deck shall be smooth, firm, dry and free from loose material.

First—Over the entire surface lay five (5) plies of Specification Tarred Felt at right angles to the incline of the roof, lapping each twenty-six (26) inches over preceding one. Each sheet shall be nailed with one (1) inch barbed roofing nails, through flat tin disks, ten (10) inches from the upper edge, nails to be spaced not more than one (1) foot apart.

Second—Mop back on each sheet for a distance of twenty (20) inches with Specification Pitch. Care should be taken that pitch moppings are held back two (2) inches from the lower edge of each sheet, and that the finished felt surface shall be free of pitch drippage from the mopping bucket.

Third—Over the entire surface spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, in which, while hot, embed not less than two hundred fifty (250) pounds of slag for each one hundred (100) square feet. The slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, dry and free from dirt. If roofing is applied during cool weather or slag is damp, it shall be heated and dried. The slag shall be warm when applied to the roof. The finished surface shall be broomed clean of all loose slag.

General—Felt shall be laid without wrinkles or buckles. Not less than sixty (60) pounds of pitch and not less than forty (40), nor more than fifty (50), pounds of asphalt shall be used for constructing each one hundred (100) square feet of completed roof. The pitch and asphalt shall not be heated above four hundred (400) degrees Fahrenheit.

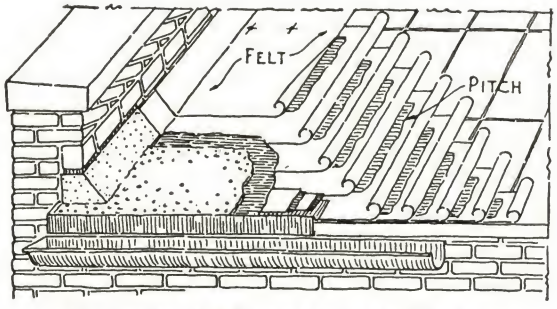
Where steep roofs join flat roof, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company of Baltimore, covering a period of ten (10) years from date of completion in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its ten year Guaranty Bond on jobs in the United States and Canada where its inspection service is available provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" roof.

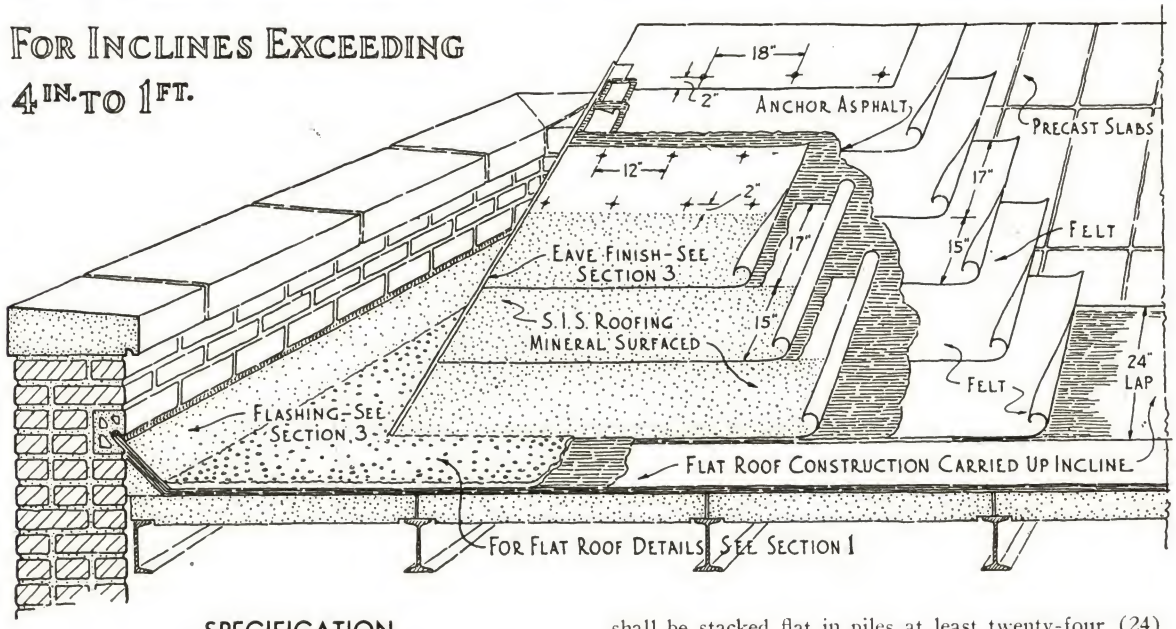


METHOD OF STARTING AT EAVES

BARRETT SPECIAL STEEP ROOFS

S.I.S. TYPE 10 YEAR GUARANTY BOND FOR USE OVER PRECAST GYPSUM SLABS

FOR INCLINES EXCEEDING 4 IN. TO 1 FT.



SPECIFICATION

All joints between precast gypsum slabs shall be properly grouted. The roof deck shall be smooth, firm, dry and free from loose material. The gypsum shall permit of nailing or creosoted wooden nailing strips shall be provided. If nailing strips are provided, they shall be parallel with the incline of the roof and shall be spaced not more than three (3) feet apart.

First—Over the entire surface lay two (2) plies of Specification Tarred Felt at right angles to the incline of roof, lapping each sheet seventeen (17) inches over preceding one. Each sheet shall be nailed two (2) inches from lower edge with barbed roofing nails, through flat tin disks, spaced not more than eighteen (18) inches.

Second—Over the entire surface spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled Barrett S. I. S. Roofing laid at right angles to the incline of the roof, lapping the sheets the full width of the seventeen (17) inch selvage. All sheets of Barrett S. I. S. Roofing shall be securely fastened in place with a double course of one and one-half (1½) inch barbed roofing nails driven through flat tin disks, and placed along the selvage side of the sheet. Nailing courses to be staggered and nails to be spaced not more than twelve (12) inches apart. The lower nailing course shall be held back two (2) inches from the mineral surfacing.

Third—Spread over the entire surface of the seventeen (17) inch selvage a uniform mopping of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled the following sheet of Barrett S. I. S. Roofing.

Fourth—All end laps shall be over-lapped at least six (6) inches. The underlying sheet of each end lap shall be nailed with six (6) nails through flat tin disks spaced five (5) inches apart starting one (1) inch from the lower edge of the sheet. The six (6) inch lap shall be coated with Barrett Anchor Brand Roofing Asphalt and the over-lapping sheet thoroughly pressed down.

Fifth—The Barrett S. I. S. Roofing shall be cut in strips not to exceed twenty (20) feet in length and shall be stacked flat in piles at least twenty-four (24) hours before using.

General—The felt and S. I. S. Roofing shall be laid without wrinkles or buckles. Not less than fifty (50) pounds of Barrett Anchor Brand Roofing Asphalt shall be used for constructing each one hundred (100) square feet of completed roof.

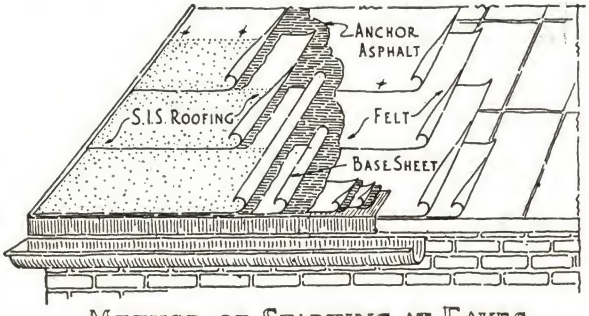
Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Co. of Baltimore, covering a period of (10) years from date of completion.

Note No. 1—THE BARRETT COMPANY will give its ten year Guaranty Bond on jobs in the United States and Canada where its inspection service is available provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" roof.



METHOD OF STARTING AT EAVES

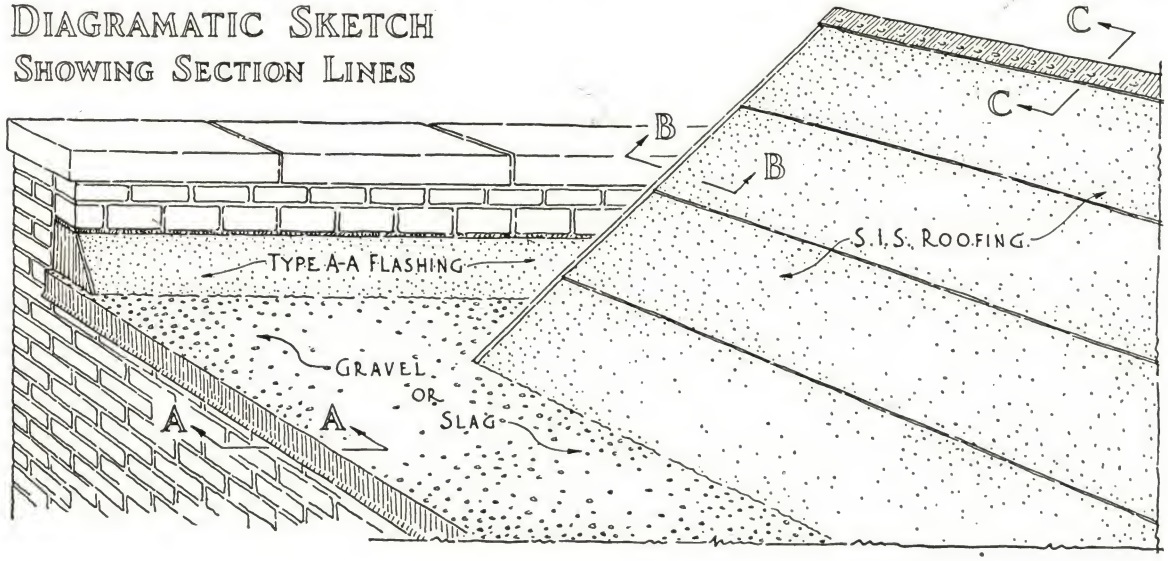
Barrett

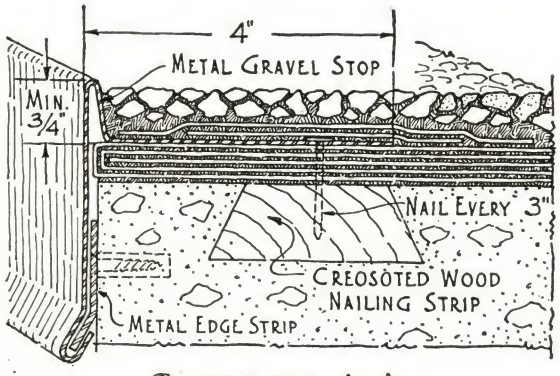
BARRETT ROOF FLASHING SYSTEM

FLAT & STEEP ROOF CONSTRUCTION

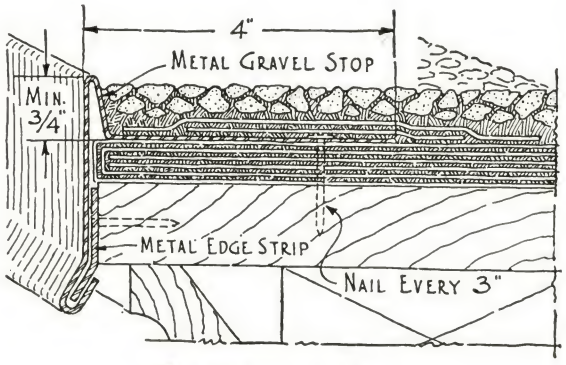
METHOD OF FINISHING EAVES & EDGES

DIAGRAMATIC SKETCH
SHOWING SECTION LINES

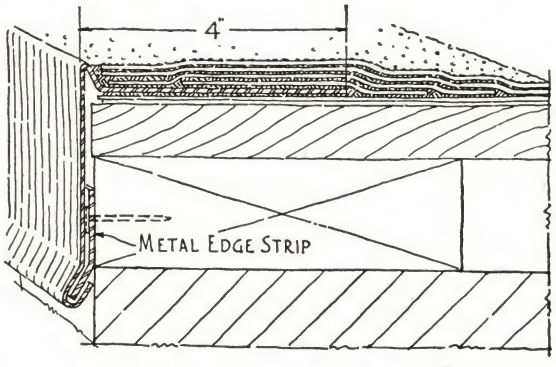




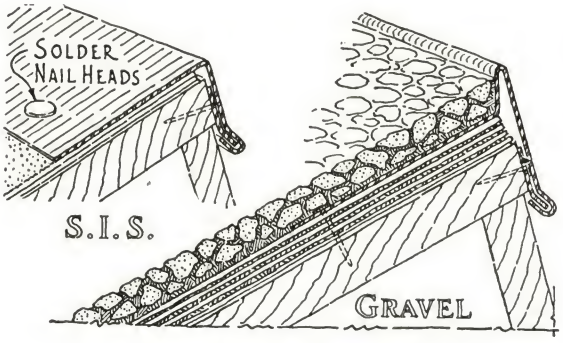
SECTION A-A
METAL EAVE FOR CONCRETE DECK



SECTION A-A
METAL EAVE FOR WOOD DECK



SECTION B-B
METAL EAVE FOR STEEP ROOFS



SECTION C-C
METAL RIDGE FOR SAWTOOTH SKYLIGHT

Barrett

SECTION III

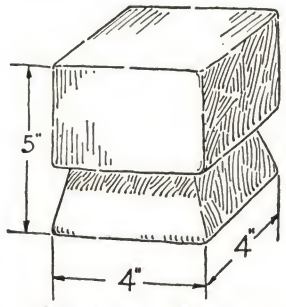
Roof Flashing Specifications

and

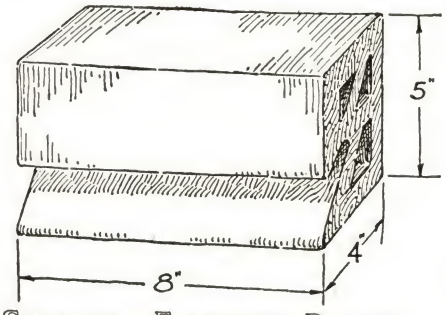
Details

BARRETT ROOF FLASHING SYSTEM

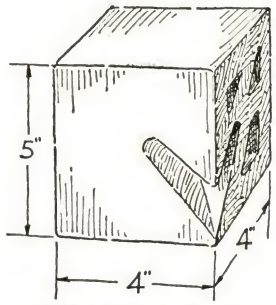
METHOD OF INSTALLING BARRETT FLASHING BLOCK



OUTSIDE CORNER

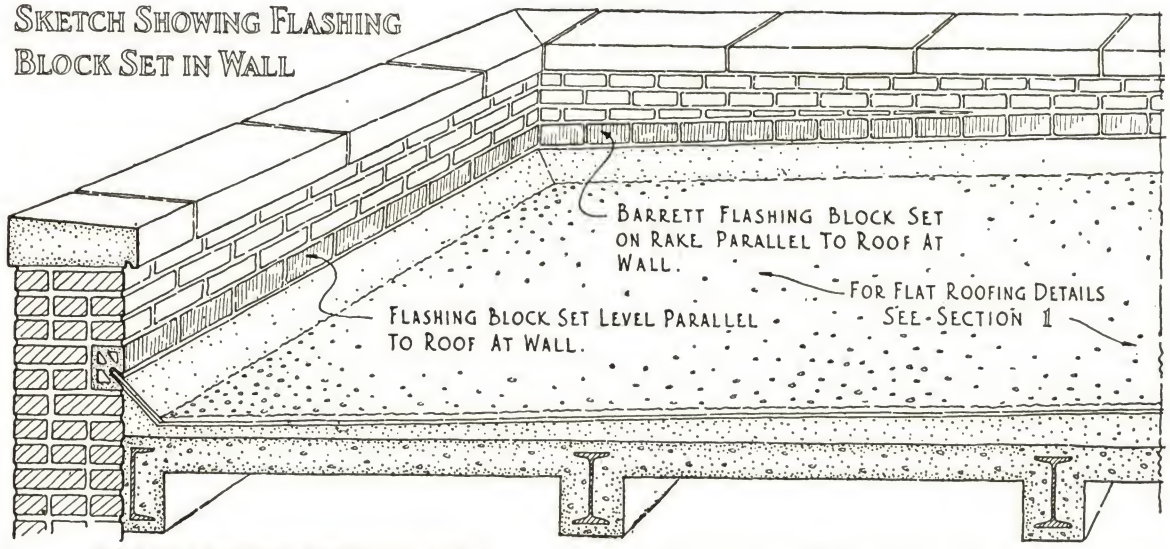


STRAIGHT FLASHING BLOCK



INSIDE CORNER

SKETCH SHOWING FLASHING BLOCK SET IN WALL



FOR MASONRY SPECIFICATION

Barrett Flashing Block shall be built into walls with the base of the block set five (5) inches above and parallel with the finished grade line of the roof at wall.

Blocks shall be laid in true alignment, set in Portland Cement Mortar, and joints shall be properly pointed. All end joints shall be solid mortar joints.

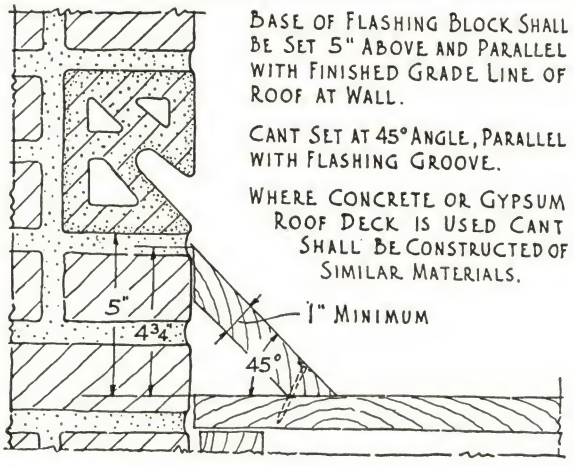
The flashing groove of the blocks shall be thoroughly cleaned of all surplus mortar.

NOTE—Special blocks are manufactured for use at right angle external and internal wall corners.

For Concrete or Gypsum Roof Deck—At angle of roof deck and the walls in which flashing block has been installed, provide a concrete cant that will permit of nailing, the upper edge of which shall terminate one-quarter (¼) inch below the flashing groove. The face of the cant shall have an incline of forty-five (45) degrees the same as the flashing groove in the block. The distance from the intermost end of flashing groove to bottom of cant strip shall not exceed ten (10) inches.

FOR CARPENTRY SPECIFICATION, BOARD ROOF DECK

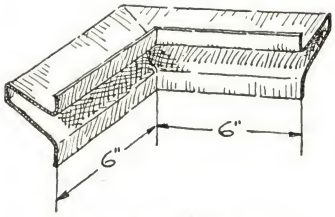
At angle of roof deck and the walls in which flashing block has been installed, provide a wood cant at least one (1) inch thick, the upper edge of which shall terminate one-quarter (¼) inch below the flashing groove. The face of the cant shall have an incline of forty-five (45) degrees, the same as the flashing groove in the block. The cant shall be securely fastened to the roof deck. The distance from the innermost end of flashing groove to bottom of cant strip shall not exceed ten inches.



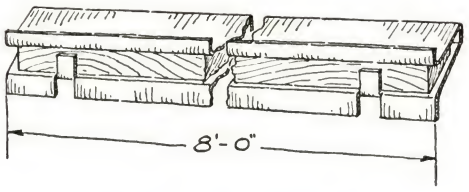
Barrett

BARRETT ROOF FLASHING SYSTEM

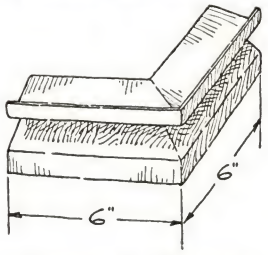
METHOD OF INSTALLING BARRETT FLASHING FORM



INSIDE CORNER

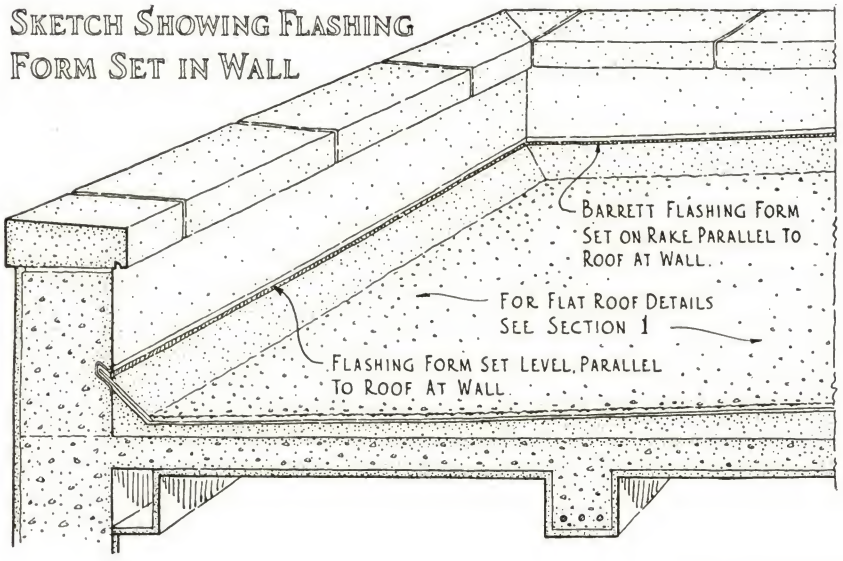


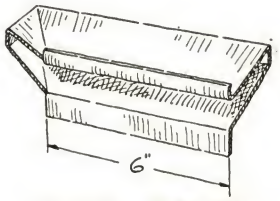
STRAIGHT FLASHING FORM



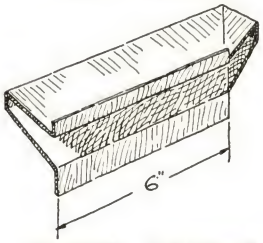
OUTSIDE CORNER

SKETCH SHOWING FLASHING FORM SET IN WALL

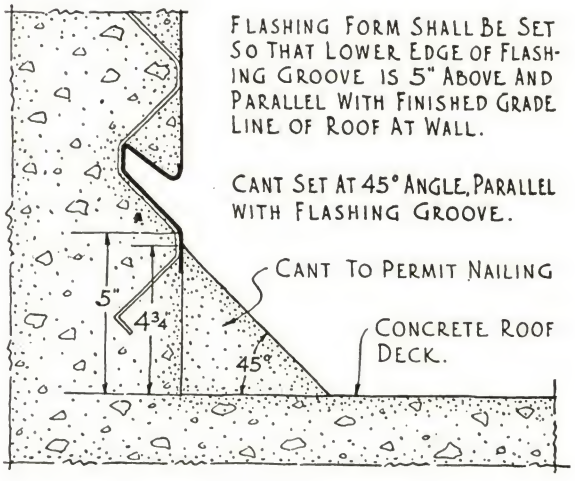




INSIDE RETURN
LEFT HAND



INSIDE RETURN
RIGHT HAND



FOR CONCRETE SPECIFICATION

Barrett Flashing Form shall be attached to the inside of the wall form by means of metal strap brackets (so provided) spaced not more than two (2) feet apart and secured by one (1) inch smooth wire nails.

Barrett Flashing Form shall be set so that the lower edge of the flashing groove is five (5) inches above and parallel with the finished grade line of the roof at wall.

Note—Special mitred flashing forms are manufactured for use at right angle external and internal wall corners.

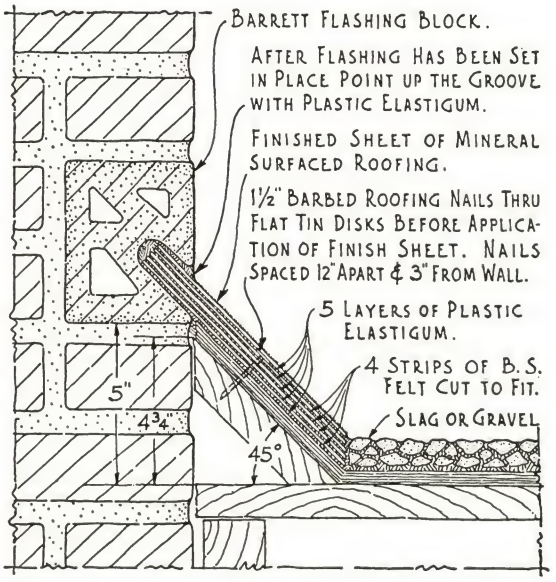
At angle of roof deck and the wall in which flashing form has been installed, provide a concrete cant that will permit of nailing, the upper edge of which shall terminate one-quarter (¼) inch below the flashing groove. The face of the cant shall have an incline of forty-five (45) degrees the same as the flashing groove in the block. The distance from the innermost end of flashing groove to bottom of cant strip shall not exceed ten (10) inches.

Barrett

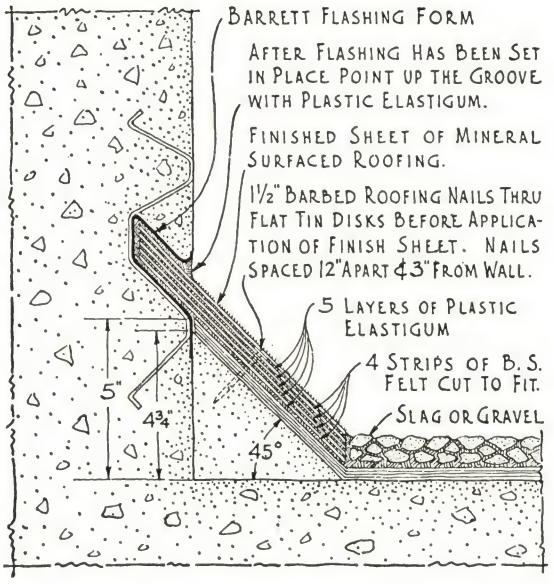
BARRETT ROOF FLASHING SYSTEM

TYPE "A-A"

20 YEAR GUARANTY BOND



BLOCK TYPE
FOR BRICK WALLS



FORM TYPE
FOR CONCRETE WALLS

SPECIFICATION

Note—This flashing shall be installed before gravel, slag, tile or other surfacing material is applied to the roof surface.

First—Before applying flashing material, the flashing groove shall be thoroughly cleaned of mortar or other foreign materials.

Second—The Felt and Pitch roofing shall be extended up the face of the cant to the wall line and cut off evenly at that point. The plies of Felt shall be solidly cemented together with Pitch and be free from wrinkles or buckles.

Third—Over the roofing, covering the cant, and up into the full depth of the flashing groove, apply a heavy uniform layer of Barrett Plastic Elastigum, into which embed one (1) ply of flashing strip cut the proper width from a roll of Barrett Specification Felt. The sheets of the flashing strips shall be lapped one (1) inch and the strips shall extend into the full depth of the flashing groove. This operation shall be repeated until four (4) layers of Plastic Elastigum and four (4) plies of flashing strip have been applied. The fourth flashing strip shall be nailed every twelve (12) inches, three (3) inches from the wall with one and one-half (1½) inch barbed roofing nails through flat tin disks. Each flashing strip shall be set in separately (not folded) and shall break joints with the underlying ply.

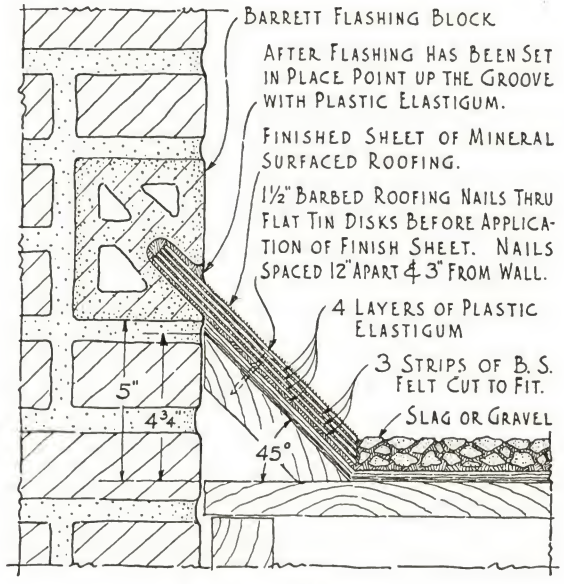
Fourth—Over the entire surface of the flashing strips thus laid, apply a uniform trowelled coating of Plastic Elastigum. Care shall be taken so that a liberal amount of Plastic Elastigum is placed along the opening of the flashing groove. Into the Plastic Elastigum embed immediately a layer of Barrett Everlastic Mineral Surfaced Roofing of the proper width, extending into the full depth of the groove and down to the roofing. The strips of Mineral Surfaced Roofing shall be cut from across the roll so that the end of each strip shall have a two (2) inch selvage. The two (2) inch selvage shall be coated with Plastic Elastigum and shall be over-lapped by the following sheet of Mineral Surfaced Roofing and thoroughly pressed down. The flashing groove shall then be pointed up with Plastic Elastigum.

Note No. 1—IMPORTANT: No projections such as vent pipes, conductor lines or braces shall be constructed through the flashing cant. All such projections shall be placed through roof deck at a point not less than ten (10) inches from the intersection of cant with roof deck.

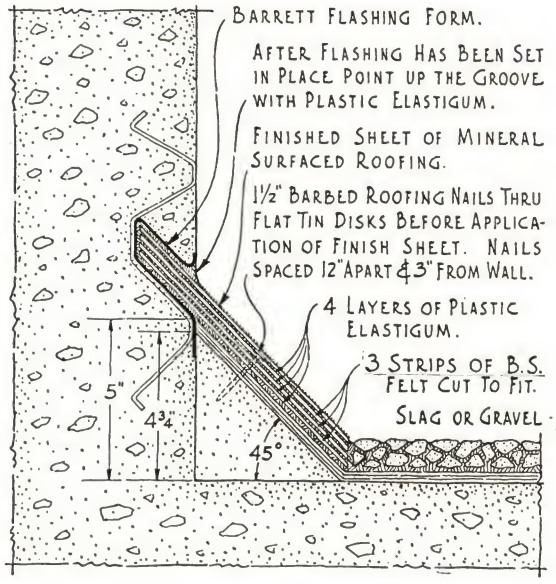
Note No. 2—THE BARRETT COMPANY will give its twenty (20) year guaranty bond on jobs in the United States and Canada where its inspection service is available, provided the flashing is installed in strict accordance with the above specification and subject to Barrett inspection and approval under the following condition: That the flashing shall be installed during the application of a Barrett Bonded Roof.

BARRETT ROOF FLASHING SYSTEM

TYPE "A"
15 YEAR GUARANTY BOND



BLOCK TYPE
FOR BRICK WALLS



FORM TYPE
FOR CONCRETE WALLS

SPECIFICATION

Note—This flashing shall be installed before gravel, slag, tile or other surfacing material is applied to the roof surface.

First—Before applying flashing material, the flashing groove shall be thoroughly cleaned of mortar or other foreign materials.

Second—The Felt and Pitch roofing shall be extended up the face of the cant to the wall line and cut off evenly at that point. The plies of Felt shall be solidly cemented together with Pitch and be free from wrinkles or buckles.

Third—Over the roofing, covering the cant, and up into the full depth of the flashing groove, apply a heavy uniform layer of Barrett Plastic Elastigum, into which embed one (1) ply of flashing strip cut the proper width from a roll of Barrett Specification Felt. The sheets of the flashing strips shall be lapped one (1) inch and the strips shall extend into the full depth of the flashing groove. This operation shall be repeated until three (3) layers of Plastic Elastigum and three (3) plies of flashing strip have been applied. The third flashing strip shall be nailed every twelve (12) inches, three (3) inches from the wall with one and one-half (1½) inch barbed roofing nails through flat tin disks. Each flashing strip shall be set in separately (not folded) and shall break joints with the underlying ply.

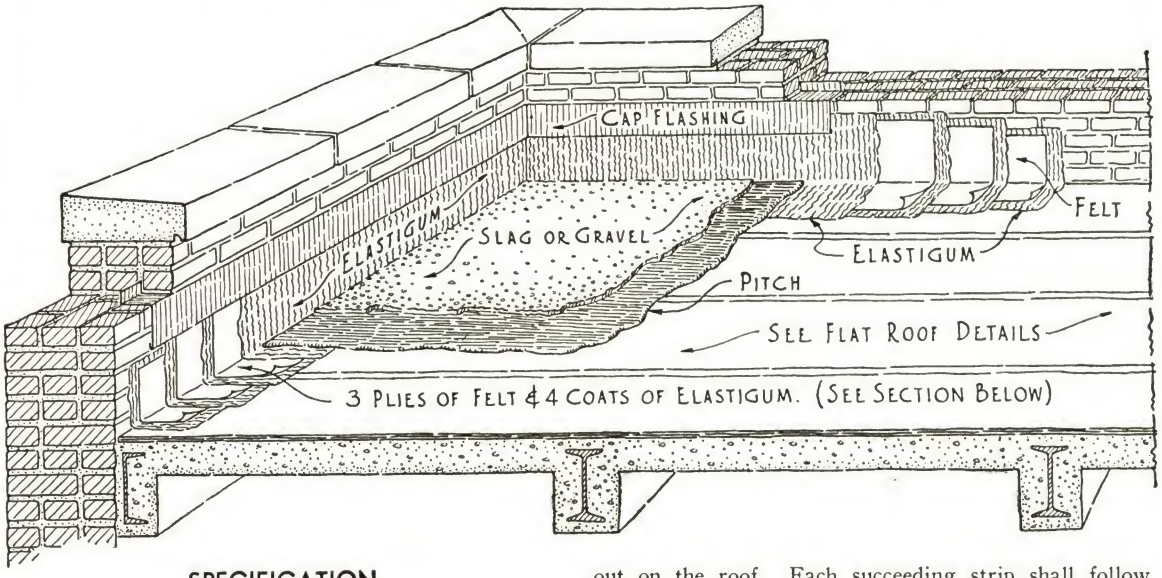
Fourth—Over the entire surface of the flashing strips thus laid, apply a uniform trowelled coating of Plastic Elastigum. Care shall be taken so that a liberal amount of Plastic Elastigum is placed along the opening of the flashing groove. Into the Plastic Elastigum embed immediately a layer of Barrett Everlastic Mineral Surfaced Roofing of the proper width, extending into the full depth of the groove and down to the roofing. The strips of Mineral Surfaced Roofing shall be cut from across the roll so that the end of each strip shall have a two (2) inch selvage. The two (2) inch selvage shall be coated with Plastic Elastigum and shall be over-lapped by the following sheet of Mineral Surfaced Roofing and thoroughly pressed down. The flashing groove shall then be pointed up with Plastic Elastigum.

Note No. 1—IMPORTANT: No projections such as vent pipes, conductor lines or braces shall be constructed through the flashing cant. All such projections shall be placed through roof deck at a point not less than ten (10) inches from the intersection of cant with roof deck.

Note No. 2—THE BARRETT COMPANY will give its fifteen (15) year guaranty bond on jobs in the United States and Canada where its inspection service is available, provided the flashing is installed in strict accordance with the above specification and subject to Barrett inspection and approval under the following condition: That the flashing shall be installed during the application of a Barrett Bonded Roof.

Barrett

BARRETT ROOF FLASHING SYSTEM
PLASTIC ELASTIGUM TYPE 10 YEAR GUARANTY
FOR BRICK OR CONCRETE WALLS



SPECIFICATION

Note—If the roofing is laid over a board deck, the first two (2) plies of Felt shall be turned up against perpendicular surfaces at least four (4) inches. If the roofing is laid over a concrete deck, all plies shall be cut off evenly at the angle of the roof deck and parapet walls.

First—After all plies of roofing have been laid and preceding the application of the slag or gravel surface, apply a uniform trowelled coating of Barrett Plastic Elastigum for a distance of ten (10) inches up the parapet wall and six (6) inches out on the roofing into which shall be immediately embedded a ten (10) inch strip of Barrett No. 15 Asphalt Felt extending up the wall six (6) inches and out on the roofing four (4) inches.

Second—This strip shall be coated with Barrett Plastic Elastigum. Then follow with a second strip of Barrett No. 15 Asphalt Felt thirteen (13) inches wide extending eight (8) inches up the wall and five (5) inches out on the roof.

Third—This strip shall be coated with Barrett Plastic Elastigum into which embed a third strip of Barrett No. 15 Asphalt Felt sixteen (16) inches wide, extending ten (10) inches up the wall and six (6) inches out on the roof.

Fourth—This strip shall be coated uniformly with Barrett Plastic Elastigum. Care shall be taken so that the top edge of the felt strips shall be pressed firmly against the masonry wall and the Plastic Elastigum feathered against it.

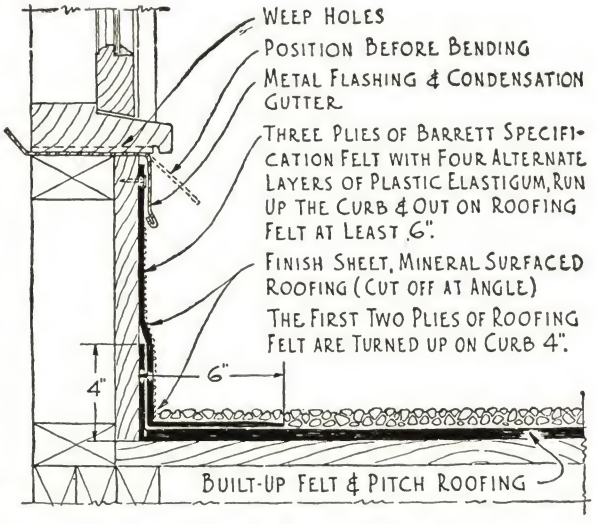
Felt strips shall not exceed ten (10) feet in length and shall be lapped at least one (1) inch and all joints broken so that each is covered by at least two (2) thicknesses of felt.

Where a cant is used, the width of the first sheet of felt installed shall be such that at least four (4) inches shall extend above top of the cant and four (4) inches out on the roof. Each succeeding strip shall follow the proportions, as specified above.

Note No. 1—The Barrett Company will give its ten-year guaranty on jobs in the United States and Canada where its inspection service is available, provided the flashing is installed in strict accordance with the above specification and subject to Barrett inspection and approval under the following condition: That the flashing shall be installed during the application of a Barrett Bonded Roof.

Architect's Note—The use of a metal counter flashing with this type of installation is optional with Architect, and if desired should be covered in specifications.

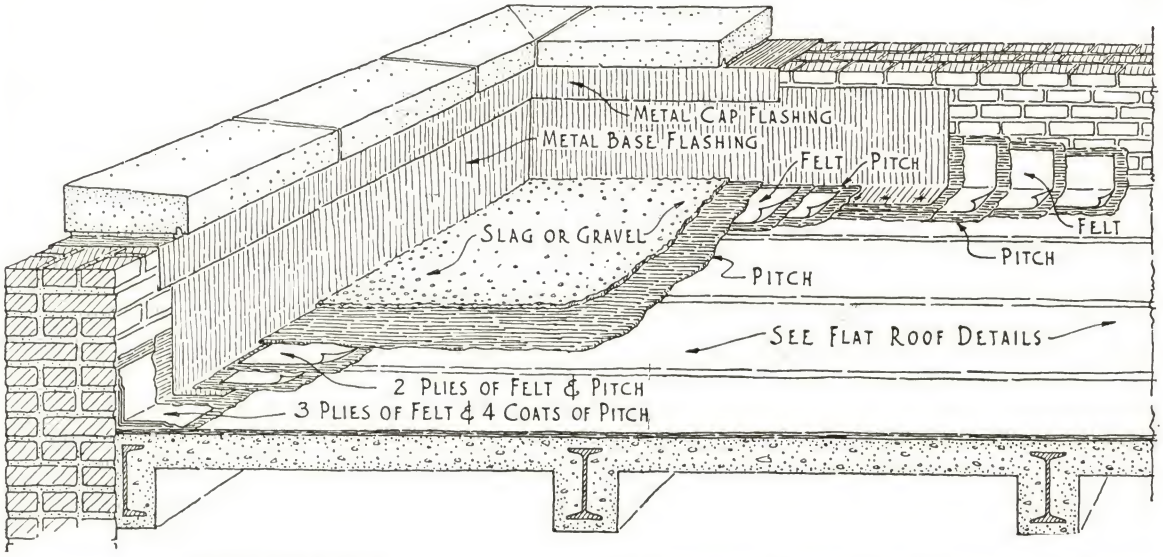
Where metal counter flashing is provided with this type of installation, and where specified, cap sheet of Barrett Everlastic mineral surfaced roofing may be applied after plastic elastigum flashing has been installed in place. Cap sheet shall be cut off at roof line. End laps shall be at least two (2) inches, with under lap well fastened and coated with plastic elastigum.



DETAIL FOR CURB FLASHING

Barrett

BARRETT ROOF FLASHING SYSTEM
METHOD OF INSTALLING METAL CAP & BASE FLASHING



SPECIFICATION

Note—Architect or engineer shall specify and describe kind of metal to be used for flashing.

Metal flashings shall be installed at all parapet walls, curbs, pent houses and other vertical surfaces as shown on plans.

Cap Flashings—(1) All cap flashings shall be set into brick walls for a distance of four (4) inches and turned up one (1) inch behind the first course of brick and down the face of the wall overlapping the base flashing at least two (2) inches. End laps shall be at least two (2) inches and soldered.

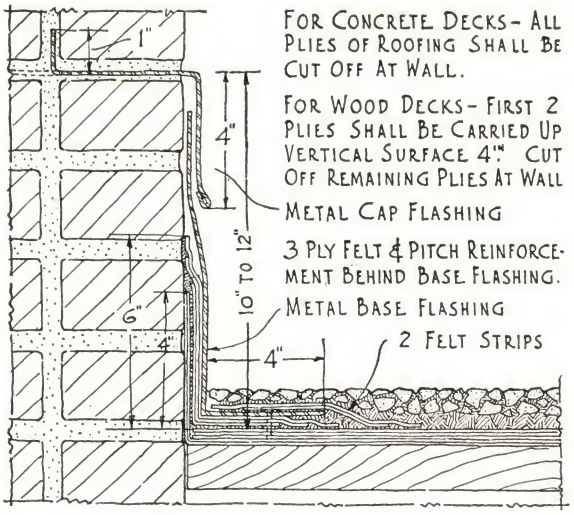
Architect's Note—Alternate Specification:
(2) All cap flashings shall be set into brick walls and shall extend from inside face of wall to within one (1) inch of outside face, and down inside face of wall overlapping the base flashing at least two (2) inches. End laps shall be at least two (2) inches and soldered.

Felt and Pitch Reinforcement—After all plies of roofing have been laid, the roofing contractor shall set in separately, at the angle of the roof deck and vertical surface, three (3) plies of tarred felt cemented together with coal tar pitch. These plies shall extend out on the roofing at least four (4) inches and up the vertical surface six (6) inches. The last ply shall be coated with coal tar pitch. For roofing guaranteed for fifteen (15) years or less, a felt and pitch reinforcement of two (2) plies is sufficient.

Base Flashings—Over the felt and pitch reinforcement thus applied, the metal base flashing shall be set, extending out on the roof four (4) inches and up the vertical surface, not less than ten (10) inches, nor more than twelve (12) inches. The base flashing shall be nailed to the roof deck with barbed roofing nails spaced not more than three (3) inches on centers on a line not exceeding three-quarters (¾) of an inch from the outer edge of the metal. If concrete roof deck does not permit of nailing, a creosoted wood nailing strip at least one (1) inch thick, with two (2) inch face and three (3) inch base, shall be installed, centered on a line three (3) inches from the vertical surface.

End laps shall be locked and soldered unless otherwise specified.

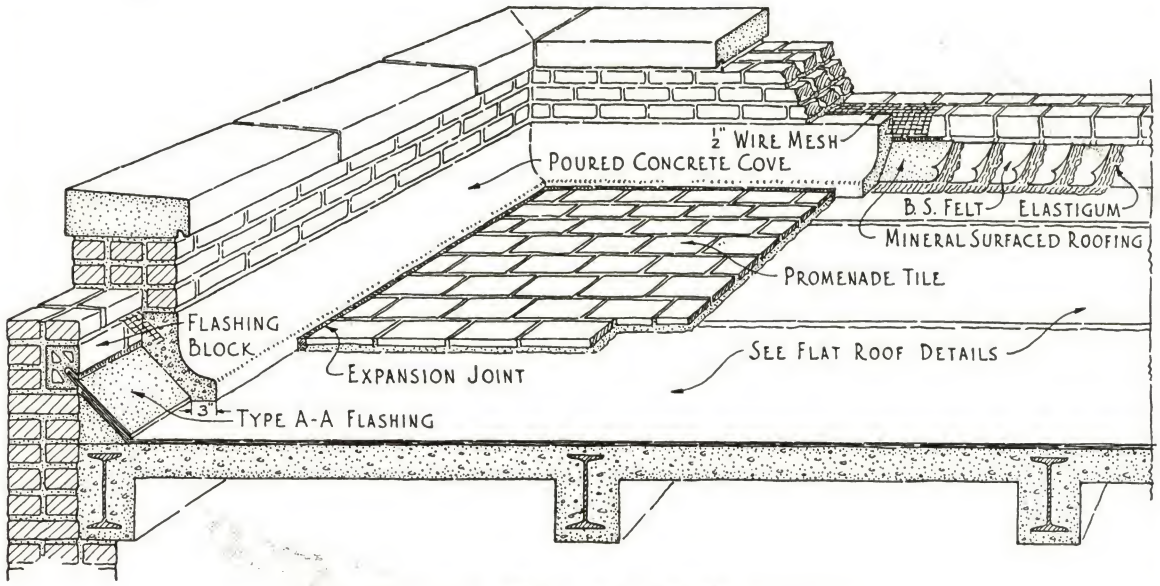
The four (4) inches of metal on the roof shall be given a priming coat of Barrett Everjet paint. It shall then be coated with Coal Tar Pitch into which shall be immediately embedded a strip of tarred felt four (4) inches wide centered over the nailing course. The first strip shall be coated with Coal Tar Pitch into which shall be immediately embedded a second strip of tarred felt six (6) inches wide completely covering the first.



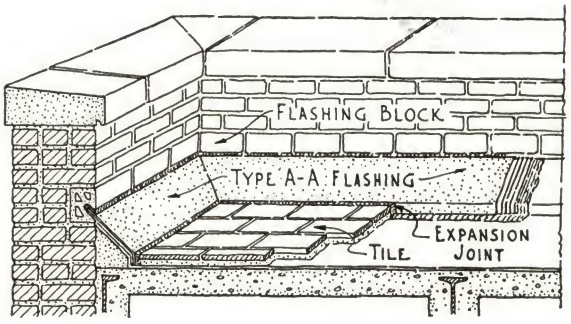
Barrett

BARRETT ROOF FLASHING SYSTEM

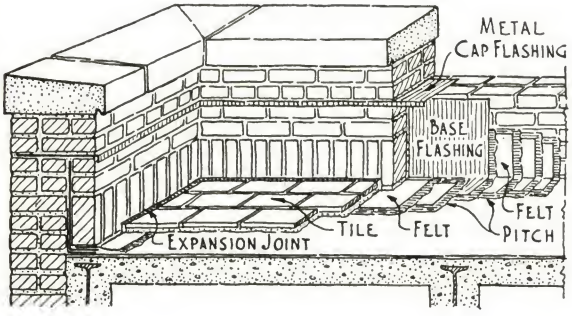
METHOD OF INSTALLING FLASHING FOR PROMENADE TILE ROOFS



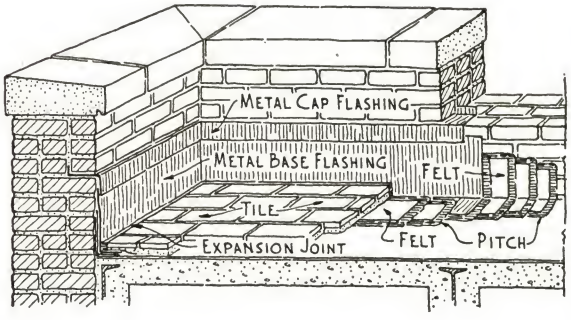
CONCEALED TYPE "A-A" FLASHING



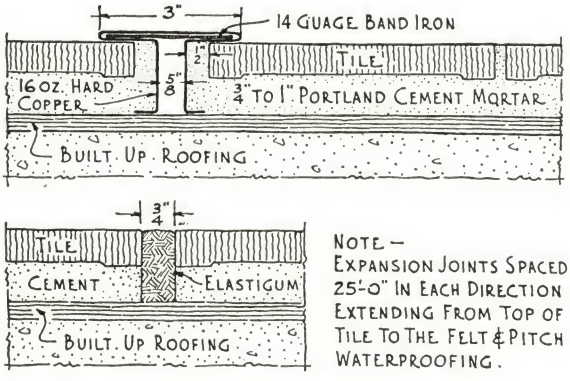
TYPE "A-A" FLASHING



CONCEALED METAL FLASHING



METAL FLASHING



NOTE — EXPANSION JOINTS SPACED 25'-0" IN EACH DIRECTION EXTENDING FROM TOP OF TILE TO THE FELT & PITCH WATERPROOFING.

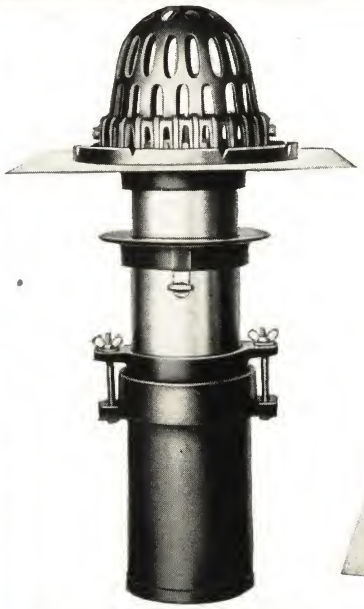
TYPES OF EXPANSION JOINTS

Barrett

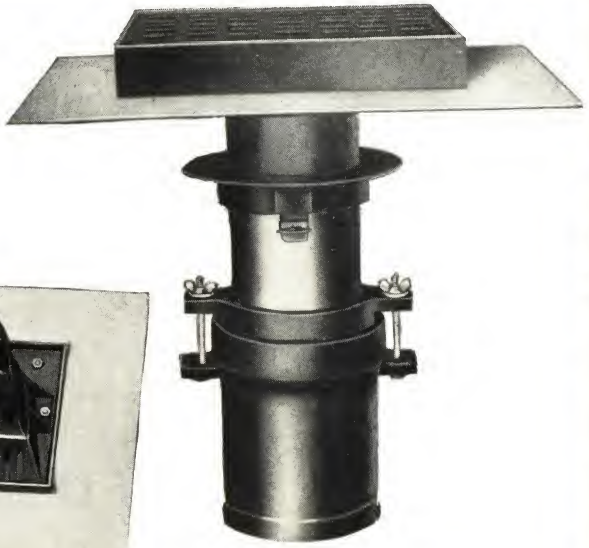
SECTION IV

Roof Drainage System Specifications and Details

BARRETT ROOF DRAINAGE SYSTEM
HOLT ROOF LEADER & VENT CONNECTIONS



Type 1 Leader Connection
for Slag or Smooth Surfaced Roofs



Type 1 Leader Connection
for Tile Surfaced Roofs

Type 2 Leader Connection
for Inclined Roofs

Type 5 Leader Connection
for Slag or Smooth Surfaced Roofs

Type 6 Leader Connection
for Slag or Smooth Surfaced Roofs

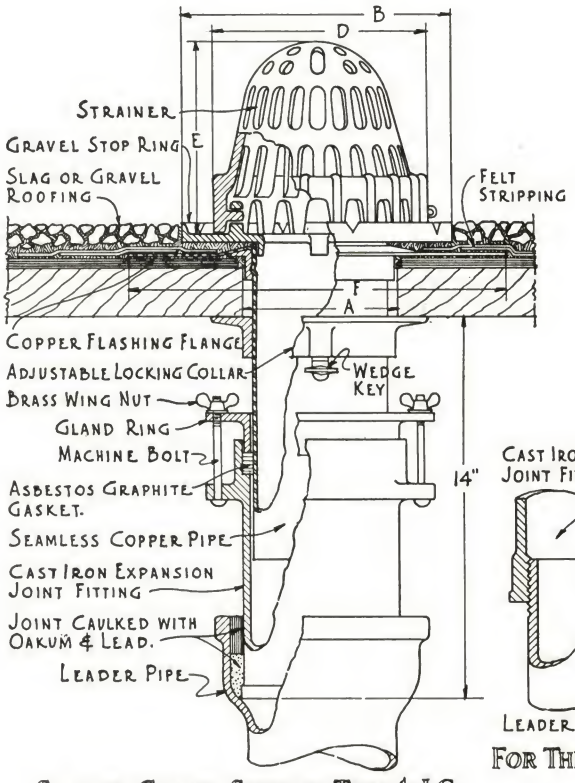
Type 6 Leader Connection
for Tile Surfaced Roofs

Type 6 Vent Connection
for Slag or Smooth Surfaced Roofs

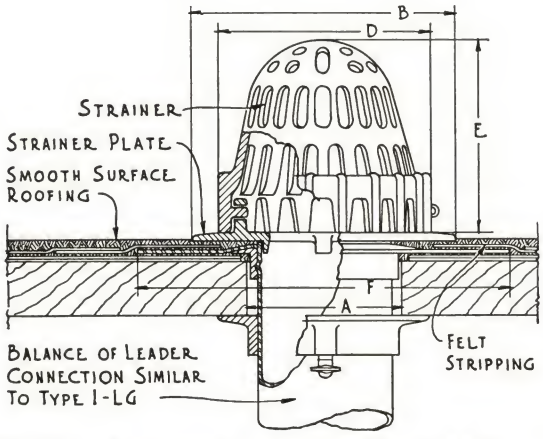
Barrett

BARRETT ROOF DRAINAGE SYSTEM

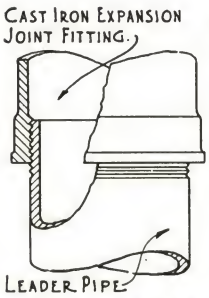
METHOD OF INSTALLING HOLT LEADER CONNECTIONS FOR TYPES 1-LG, 1-LS & 1-LM



SLAG OR GRAVEL SURFACE-TYPE 1-LG



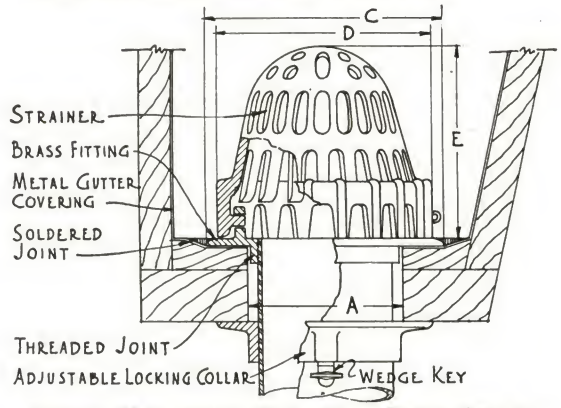
SMOOTH SURFACE-TYPE 1-LS



FOR THREADED PIPE

SIZE OF PIPE	A	B	C	D	E	F
3"	4"	8"	7"	6¾"	6⅞"	12"x12"
4"	5"	8"	7"	6¾"	6⅞"	12"x12"
5"	6"	10¾"	9¾"	9½"	8½"	14"x14"
6"	7"	10¾"	9¾"	9½"	8½"	16"x16"
8"	9"	11¾"	11"	10½"	9½"	18"x18"
10"	11"	14¼"	13½"	13"	11"	20"x20"

DIMENSION TABLE



METAL COVERED GUTTERS - TYPE 1-LM

TABLE SHOWING LENGTH OF CONNECTION REQUIRED FOR GIVEN THICKNESS OF ROOF DECK	
THICKNESS OF ROOF DECK	LENGTH OF CONNECTION
1" MAX.	10"
3" "	12"
5" "	14"
7" "	16"
9" "	18"

NOTE.- WHEN SCREW THREAD PIPE IS TO BE USED IN BUILDINGS CONSTRUCTED OF STEEL, CONCRETE, BRICK, STONE OR SIMILAR NON-SHRINKABLE MATERIAL, AND THE EXPANSION AND CONTRACTION OF THE LEADER PIPE WILL NOT EXCEED 1", A CONNECTION 2" SHORTER MAY BE USED. THE MINIMUM LENGTH OF THE CONNECTION IS 10".

These types are used as leader connections on flat roofs having interior drainage, except roofs covered with tile or a similar material, and where ample working space is provided below the roof deck.

SPECIFICATION

The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with leader pipe.

Barrett Holt Roof Leader Connection, Type .... shall be installed at all drainage outlets and shall be of proper size and length to connect to .... inch leader pipe as shown on Drawing No. .....

Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

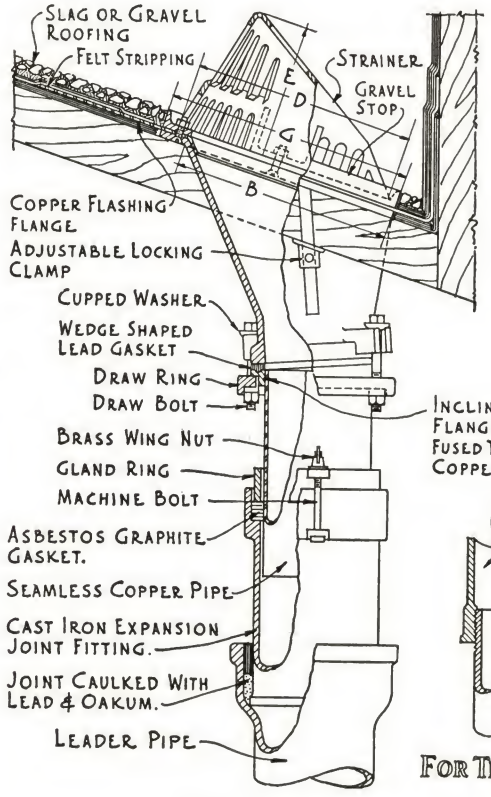
Note—Where built-up roofing is used as a roof covering, two plies of Felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches before application of finished roof surfacing.

Important—The copper flashing flange being an integral part of the Type 1LG, 1LS and 1LM Connections, shall in no case be removed. If the flange is bent, it shall be straightened and made smooth before it is set in place. The flashing flange shall be secured to the roof deck with nails wherever possible.

Barrett

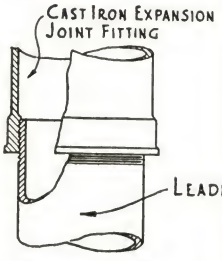
BARRETT ROOF DRAINAGE SYSTEM

METHOD OF INSTALLING HOLT LEADER CONNECTIONS FOR TYPES 2-LG & 2-LS



SIDE VIEW

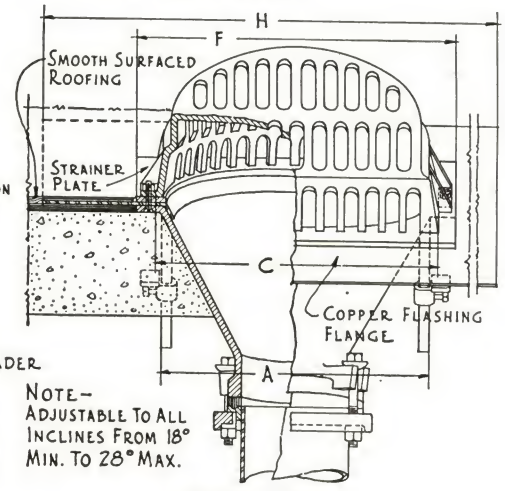
SLAG OR GRAVEL SURFACE TYPE 2-LG



FOR THREADED PIPE

SIZE OF PIPE	A	B	C	D	E	F	G	H
3"	9 1/8"	6 3/4"	10 1/8"	7 1/8"	4 5/8"	10 7/8"	7 1/8"	18"x18"
4"	10 3/8"	8 3/8"	11 3/8"	8 5/8"	5 3/8"	12 1/4"	9 3/8"	20"x20"
5"	11 3/8"	9 1/8"	12 1/2"	9 1/8"	5 1/2"	13 1/8"	10 1/2"	22"x22"
6"	12 3/4"	10 3/8"	13 3/4"	10"	5 7/8"	14 1/4"	11 3/4"	24"x24"
8"	THIS CONNECTION ON SPECIAL ORDER.							

DIMENSION TABLE



FRONT VIEW

SMOOTH SURFACE TYPE 2-LS

This type is used as a leader connection on inclined roofs ranging from 12 to 42 degrees and having interior drainage. The range of variation of the standard connection is from 18° to 28°. For lesser inclines ranging from 12° to 18° or greater inclines ranging from 28° to 42°, special fittings are furnished.

SPECIFICATION

The opening through the roof deck shall be of proper size to receive the Roof Leader Connection, and shall be concentric with leader pipe.

First—Barrett Holt Roof Leader Connection, Type ..... shall be installed at all drainage outlets and shall be of proper size and length to connect to ..... inch leader pipe as shown on Drawing No. ....

Second—Holt Roof Leader Connection shall be adjusted to fit the roof incline and draw-bolts tightened to obtain a water-tight joint. The Connection shall be set in place so that the lower surface of the iron flange shall be flush with the finished surface of the roof deck. The adjustable locking clamps shall be brought up tightly against the under-side of the roof deck and firmly fastened with the set screws so that the Connection is made integral with the roof deck.

Third—At each drainage point a section of the valley roofing not less than three (3) feet wide shall be carried up the inclined surface of the roof deck not less than two (2) feet. Roofing shall terminate at the outer edge of the iron flange of the Connection.

Fourth—After all roofing felt has been laid and before the finished wearing surface is applied, the surface of the iron flange of the Connection shall be thoroughly cleaned and the copper flashing flange embedded in Plastic Elastigum. If the flange is bent it shall be straightened and made smooth before being set in place. Flashing flange shall be nailed wherever possible. Iron gravel stop ring or strainer plate shall be set in Plastic Elastigum and firmly drawn down by brass nuts.

Fifth—The cast iron strainer shall be fastened in place (if a brass or aluminum strainer is desired it shall be specified).

Sixth—The copper Flashing Flange shall be thoroughly mopped with hot bitumen into which, while hot, the steep roofing shall be applied and brought up to the gravel stop or strainer plate.

Seventh—The valley roofing shall be laid and brought up to the gravel stop or strainer plate.

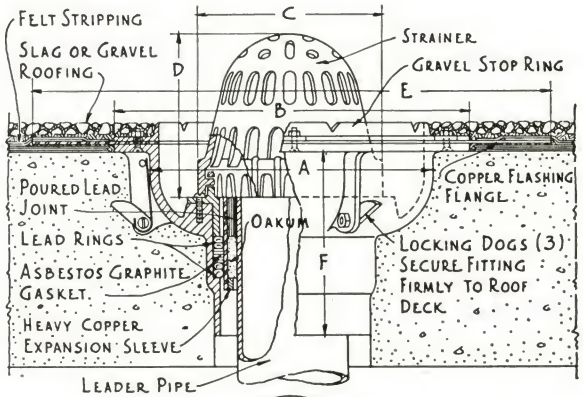
Eighth—The gland ring, gasket and expansion joint fitting shall be set in place and the last length of leader pipe cut to proper length and placed in position. The lower end of the expansion joint fitting shall be not less than fourteen (14) inches from the bottom of the veins on the side of the roof bowl.

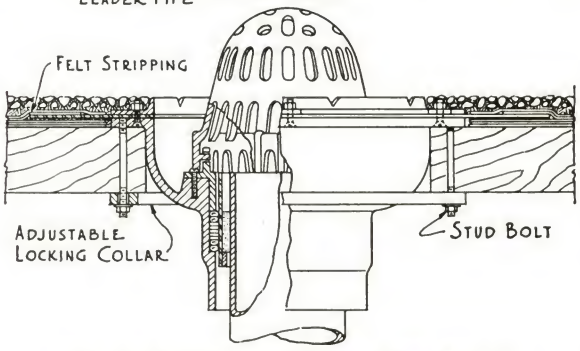
Ninth—The gasket and gland ring shall be brought down into the expansion joint fitting, bolted and tightened sufficiently by the wing nuts to obtain a water-tight connection. The joint between the expansion joint and the leader pipe shall then be made.

Barrett

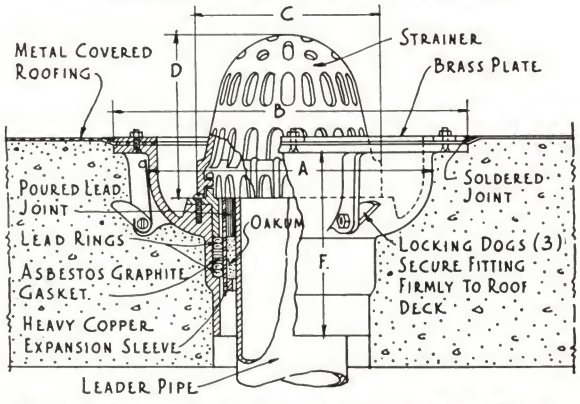
BARRETT ROOF DRAINAGE SYSTEM

METHOD OF INSTALLING HOLT LEADER CONNECTIONS FOR TYPES 5-LG, 5-LS & 5-LM





SLAG OR GRAVEL SURFACE TYPE 5-LG



METAL COVERED GUTTERS & ROOFS TYPE 5L-M

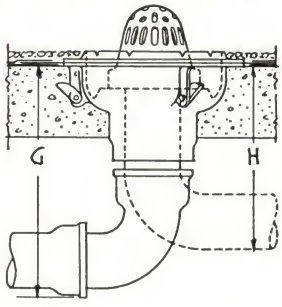
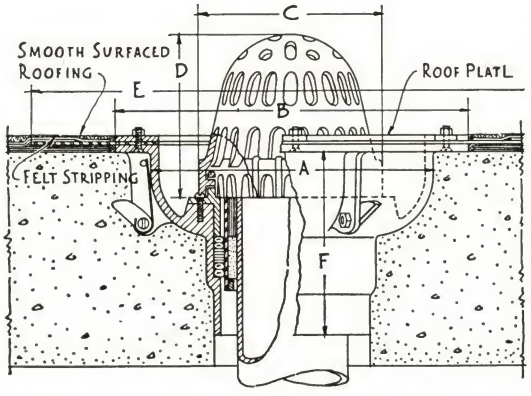


TABLE OF MIN. DIMENSIONS		
SIZE OF PIPE	G	H
3"	17¾"	11½"
4"	18¼"	12"
5"	18¾"	12½"
6"	19¼"	13"
8"	20"	13½"



SMOOTH SURFACE TYPE 5-LS

NOTE—
STUD BOLTS AND ADJUSTABLE LOCKING COLLAR USED ONLY FOR WOOD OR GYPSUM ROOF DECKS.

SIZE OF PIPE	A	B	C	D	E	F
3"	10¼"	12⅝"	6¾"	6⅛"	20"x20"	7"
4"	12¼"	14⅝"	9½"	8½"	24"x24"	7"
5"	12¼"	14⅝"	9½"	8½"	24"x24"	7"
6"	13¼"	15⅝"	10½"	9½"	24"x24"	7"
8"	15¼"	17⅝"	13"	11"	26"x26"	7"

DIMENSION TABLE

These types are used as leader connections on flat roofs having interior drainage, where a sump type of roof connection is desired.

SPECIFICATION

The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with the leader pipe.

Barrett Holt Roof Leader Connection Type ..... shall be installed at all drainage outlets and shall be of proper size and length to connect to ..... inch leader pipe as shown on Drawing No.....

Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

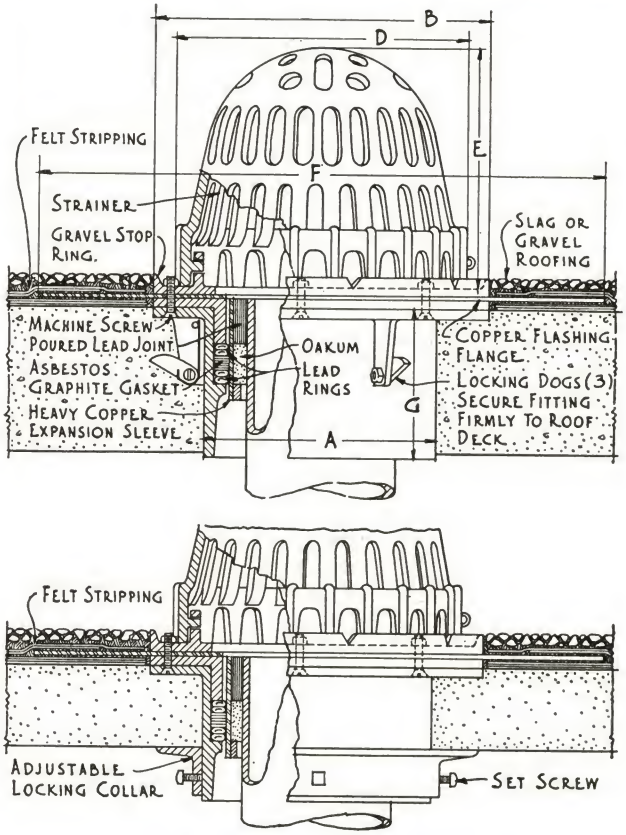
Note—Where built-up roofing is used as a roof covering, two plies of felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches.

When used in connection with gypsum or wood roof decks, types 5LG, 5LS and 5LM Connections are equipped with threaded stud bolts which hold the adjustable locking collar in place.

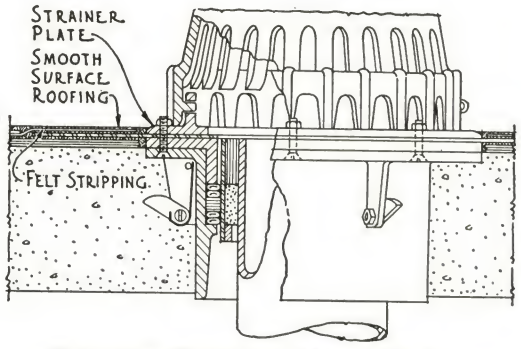
Barrett

BARRETT ROOF DRAINAGE SYSTEM

METHOD OF INSTALLING HOLT LEADER CONNECTIONS FOR TYPES 6-LG, 6-LS & 6-LM



SLAG OR GRAVEL SURFACE-TYPE 6-LG

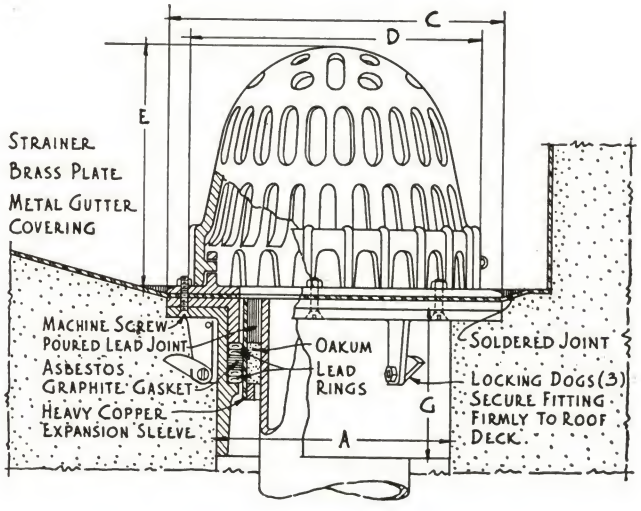


SMOOTH SURFACE-TYPE 6-LS

SIZE OF PIPE	A	B & C	D	E	F	G
3"	6¼"	10¾"	9½"	8½"	16"x16"	4½"
4"	7¼"	10¾"	9½"	8½"	18"x18"	4½"
5"	8¼"	11¾"	10½"	9½"	20"x20"	4½"
6"	9¼"	11¾"	10½"	9½"	20"x20"	4½"
8"	11¼"	14¼"	13"	11"	24"x24"	4½"

DIMENSION TABLE

These types are used as leader connections on flat roofs having interior drainage, except roofs covered with tile or a similar material, and where working space below the roof deck is restricted.



METAL COVERED GUTTERS & ROOFS-TYPE 6 L-M

SPECIFICATION

The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with the leader pipe.

Barrett Holt Roof Leader Connection Type ..... shall be installed at all drainage outlets and shall be of proper size and length to connect to ..... inch leader pipe as shown on Drawing No.....

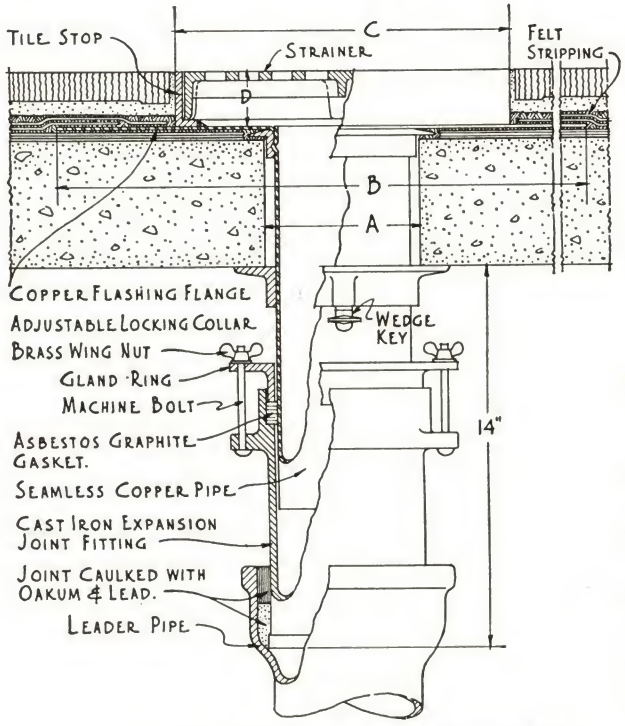
Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

Where built-up roofing is used as a roof covering, two plies of felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches before application of finished surfacing.

Note—Where gypsum or wood roof deck exceeds 3½ inches in thickness, types 6LG, 6LS and 6LM Connections are equipped with threaded stud bolts which hold the adjustable locking collar in place.

BARRETT ROOF DRAINAGE SYSTEM

METHOD OF INSTALLING HOLT LEADER CONNECTIONS TYPES 1-LT & 6-LT FOR TILE SURFACED ROOFS



TILE OR SIMILAR SURFACE-TYPE 1-LT

SIZE OF PIPE	A	B	C	D
3"	4"	18"x18"	10 3/8"	3/4" TO 3 1/2" UNIT OF VARIATION 1/4"
4"	5"	18"x18"	10 3/8"	
5"	6"	18"x18"	10 3/8"	
6"	7"	18"x18"	10 3/8"	
8"	9"	ON SPECIAL ORDER ONLY		
10"	11"			

DIMENSION TABLE

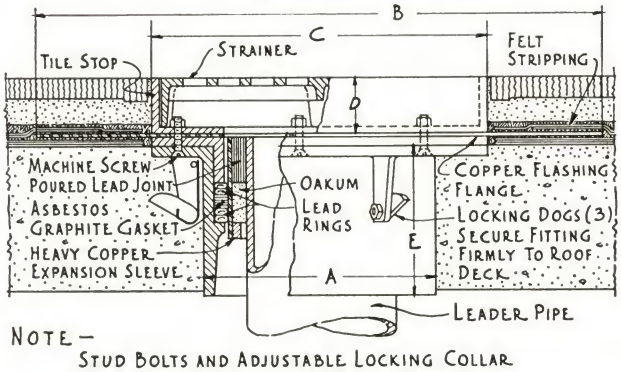
SPECIFICATION

The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with leader pipe.

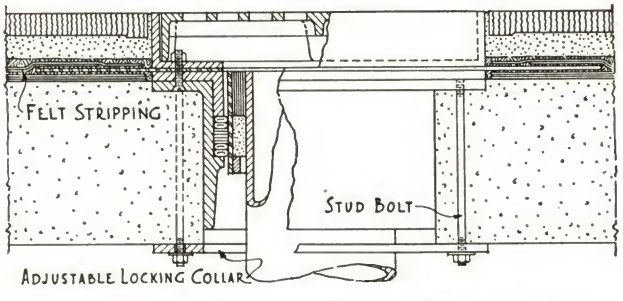
Barrett Holt Roof Leader Connection Type .... shall be installed at all drainage outlets and shall be of proper size and length to connect to .. inch leader pipe as shown on Drawing No. .....

Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

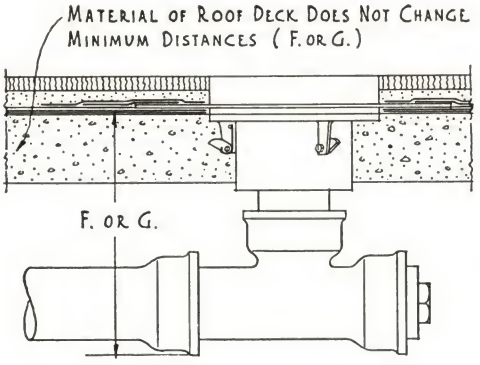
Before the application of the cement bed or the finished surfacing material, two plies of felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches.



NOTE—
STUD BOLTS AND ADJUSTABLE LOCKING COLLAR USED ONLY FOR WOOD OR GYPSUM ROOF DECKS.



TILE OR SIMILAR SURFACE-TYPE 6-LT



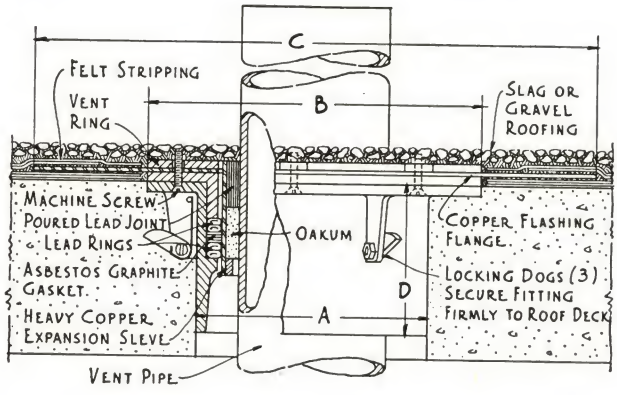
F— REFERS TO CAST IRON SOIL PIPE
G— REFERS TO WROUGHT IRON OR STEEL SCREW PIPE.

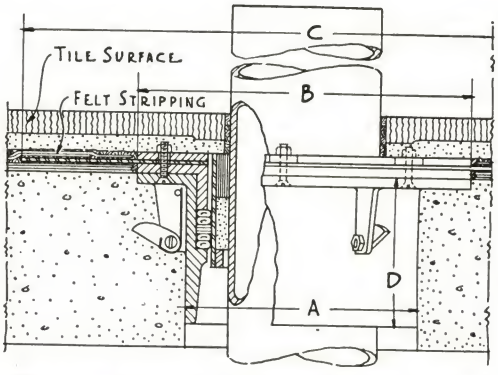
SIZE OF PIPE	A	B	C	D	E	F	G
3"	6 1/4"	20"x20"	10 1/2"	1" TO 3 1/2" UNIT OF VARIATION 1/4"	4 1/2"	15 1/4"	13 1/2"
4"	7 1/4"	20"x20"	10 1/2"		4 1/2"	15 3/4"	14 1/4"
5"	8 1/4"	20"x20"	10 1/2"		4 1/2"	16 1/4"	14 3/4"
6"	9 1/4"	20"x20"	10 1/2"		4 1/2"	16 3/4"	15 1/4"
8"	11 1/4"	24x24	SPEC.		4 1/2"	17 3/4"	17 3/4"

DIMENSION TABLE

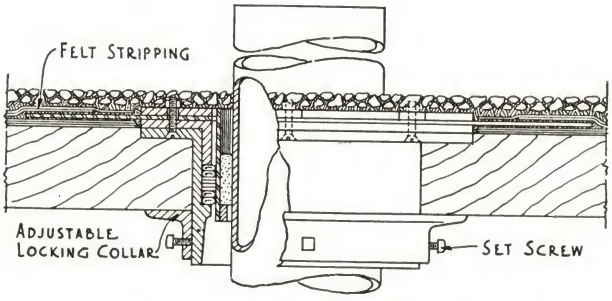
BARRETT ROOF DRAINAGE SYSTEM

METHOD OF INSTALLING HOLT VENT CONNECTIONS FOR TYPES 6-VG, 6-VS, 6-VT & 6-VM

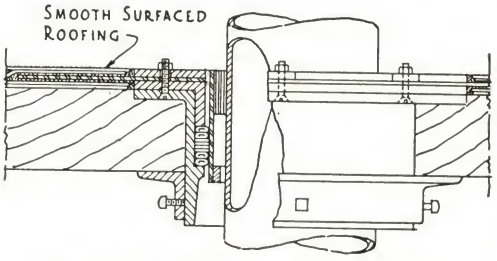




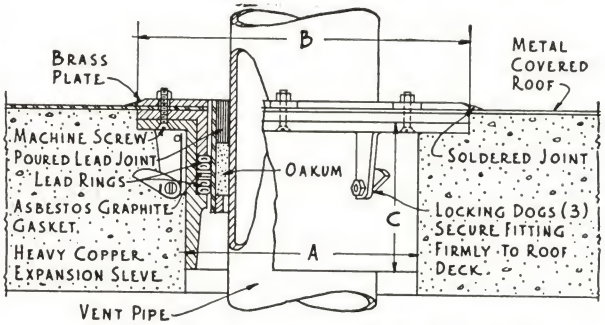
TILE OR SIMILAR SURFACE-TYPE 6-VT



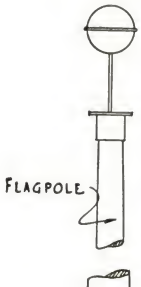
SLAG OR GRAVEL SURFACE-TYPE 6-VG



SMOOTH SURFACE-TYPE 6-VS

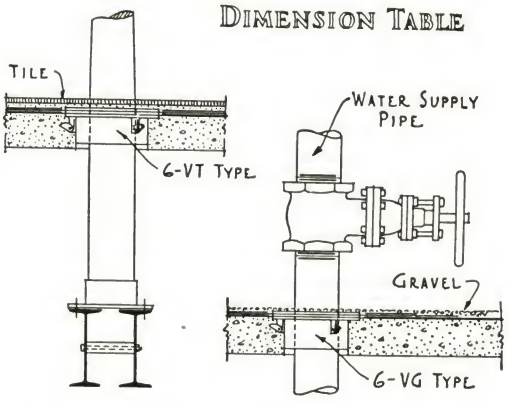


METAL COVERED ROOFS-TYPE 6-VM



SIZE OF PIPE	A	B	C	D
3"	6 1/4"	8 3/4"	16"x16"	4 1/2"
4"	7 1/4"	9 3/4"	18"x18"	4 1/2"
5"	8 1/4"	10 3/4"	20"x20"	4 1/2"
6"	9 1/4"	11 3/4"	20"x20"	4 1/2"
8"	11 1/4"	14 3/8"	24"x24"	4 1/2"

DIMENSION TABLE



6-V TYPES CAN BE USED FOR WATER PIPES, FLAGPOLES, FIRE LINES, ETC.

These types used on flat roofs for soil and waste vent stacks, flag-poles, supply pipes or any similar fixture carried through the roof deck.

SPECIFICATION

The opening through roof deck shall be of proper size to receive Roof Vent Connection and shall be concentric with vent pipe.

Barrett Holt Roof Vent Connection Type .... shall be installed at all vent openings and shall be of proper size to connect with .. inch vent pipe as shown on Drawing No. .....

Holt Roof Vent Connections shall be installed and connected complete in strict accordance with directions of manufacturer.

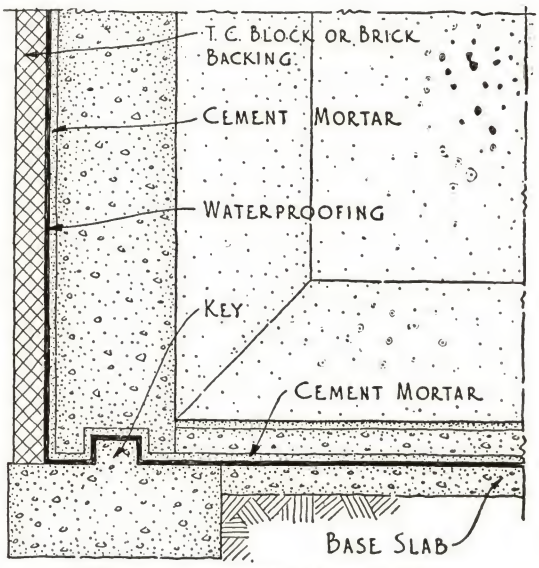
Where built-up roofing is used as a roof covering, two plies of felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches before the application of finished surfacing.

Note: Where gypsum or wood roof decks exceed 3½ inches in thickness, Connections are equipped with threaded stud bolts which hold adjustable locking collar in place.

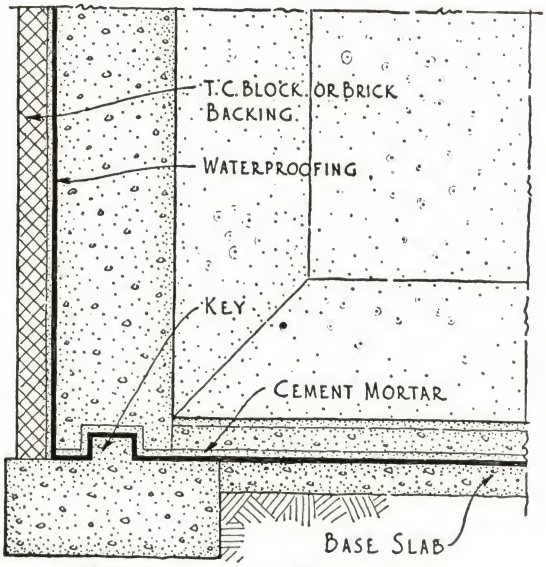
SECTION V

Waterproofing
Specifications
and
Details

BARRETT WATERPROOFING SYSTEM
MEMBRANE METHOD
SUBSTRUCTURE WATERPROOFING



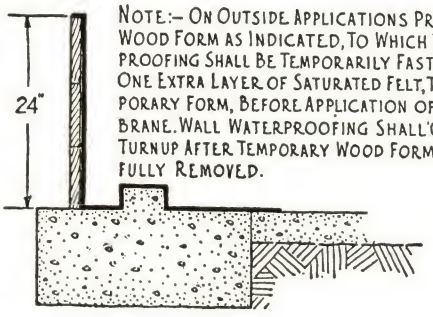
WATERPROOFING DETAIL FOR OUTSIDE WALLS, FOOTINGS ETC.
- INSIDE APPLICATION -



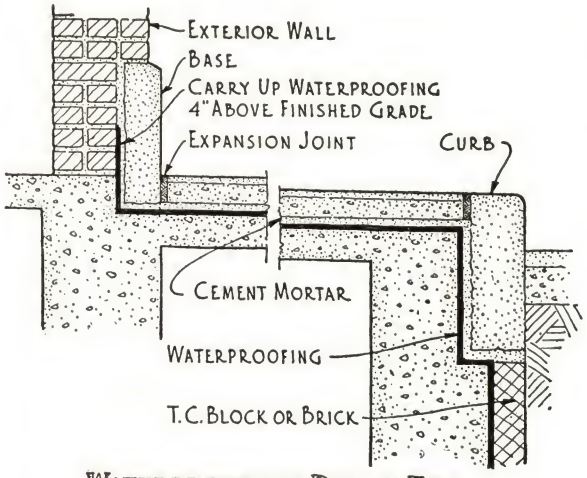
WATERPROOFING DETAIL FOR OUTSIDE WALLS, FOOTINGS ETC.
- OUTSIDE APPLICATION -

NOTE:–
ON INSIDE APPLICATIONS WATERPROOFING MEMBRANE, AS SPECIFIED, IS APPLIED DIRECTLY TO THE TILE OR BRICK BACKING AS INDICATED

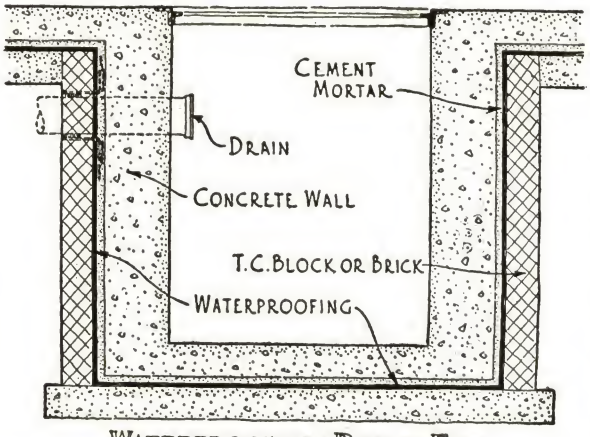
IMPORTANT –
ALL MASONRY SHALL BE DESIGNED TO WITHSTAND THE MAXIMUM HYDROSTATIC PRESSURE.
SEE PLATE 36 FOR WATERPROOFING SPECIFICATIONS.



NOTE:– ON OUTSIDE APPLICATIONS PROVIDE TEMPORARY WOOD FORM AS INDICATED, TO WHICH THE FLOOR WATERPROOFING SHALL BE TEMPORARILY FASTENED. PROVIDE ONE EXTRA LAYER OF SATURATED FELT, TACKED DRY TO TEMPORARY FORM, BEFORE APPLICATION OF SPECIFIED MEMBRANE. WALL WATERPROOFING SHALL OVERLAP MEMBRANE TURNUP AFTER TEMPORARY WOOD FORMS HAVE BEEN CAREFULLY REMOVED.



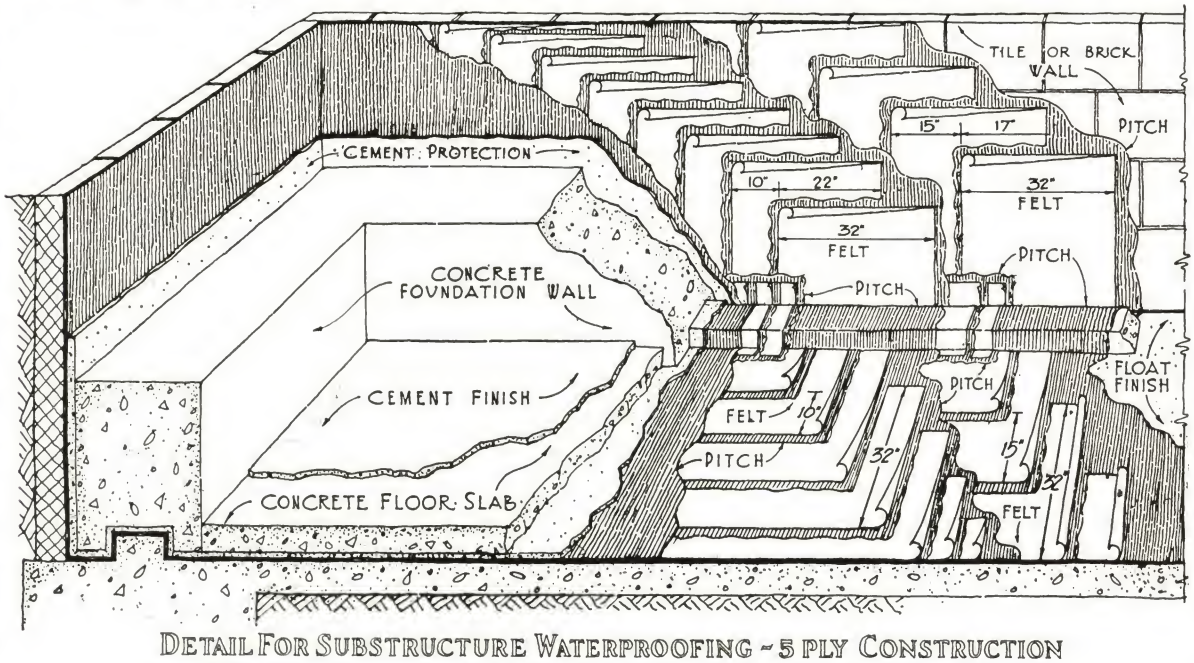
WATERPROOFING DETAIL FOR VAULTS & TUNNELS



WATERPROOFING DETAIL FOR SUMPS & PITS

Barrett

BARRETT WATERPROOFING SYSTEM
MEMBRANE METHOD
SUBSTRUCTURE WATERPROOFING



DETAIL FOR SUBSTRUCTURE WATERPROOFING - 5 PLY CONSTRUCTION

IMPORTANT—All Masonry Shall be Designed to Withstand Maximum Hydrostatic Pressure

SPECIFICATION

The waterproofing shall be applied by a waterproofing contractor approved by THE BARRETT COMPANY, who has had experience in successfully applying this type of built-up waterproofing on sub-grade construction, and who can refer to work of a similar nature that he has executed in a satisfactory manner.

All surfaces on which the waterproofing is to be applied shall be firm, smooth and dry, and free from loose materials, and shall be covered by a membrane of continuous waterproofing consisting of..... plies of Specification Tarred Felt and..... moppings of Specification Waterproofing Pitch.

First—Coat the entire surface on which the waterproofing is to be applied, with Specification Waterproofing Pitch into which, while hot, embed a layer of Specification Felt, following this with alternating moppings of Pitch and layers of Felt until.....moppings of Pitch and..... layers of Felt have been applied. Each layer of Felt shall be thoroughly rubbed into the hot Pitch, and the entire surface shall be immediately mopped with Pitch to insure thorough embedment of the Felt. The Felt shall be laid without wrinkles or buckles, and the finished membrane shall be free from pockets or blisters.

Second—Not less than.....* pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the Pitch shall not be heated above three hundred and fifty (350) degrees, Fahrenheit.

Third—At wall angles and footings and places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

Fourth—Where laps are left to be connected, they shall be not less than ten (10) inches wide, and shall be temporarily protected by one-half (½) inch troweled course of Portland Cement Mortar. When connections with laps are made, laps shall be carefully cleaned, dry, and mopped with Pitch before proceeding with the work.

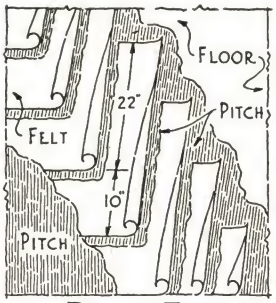
Fifth—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent protective finish or wall.

Sixth—The waterproofing shall be immediately protected by tile, brick, concrete or similar material as specified.

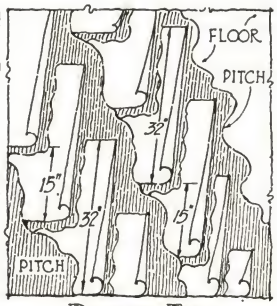
**Architect's Note*—For five (5) ply construction six (6) alternating moppings of Pitch shall be required, and not less than two hundred and ten (210) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing.

For four (4) ply construction five (5) alternating moppings of Pitch shall be required, and not less than one hundred and seventy-five (175) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing.

For three (3) ply construction four (4) alternating moppings of Pitch shall be required, and not less than one hundred and forty (140) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing.



DETAIL FOR 3 PLY CONSTRUCTION



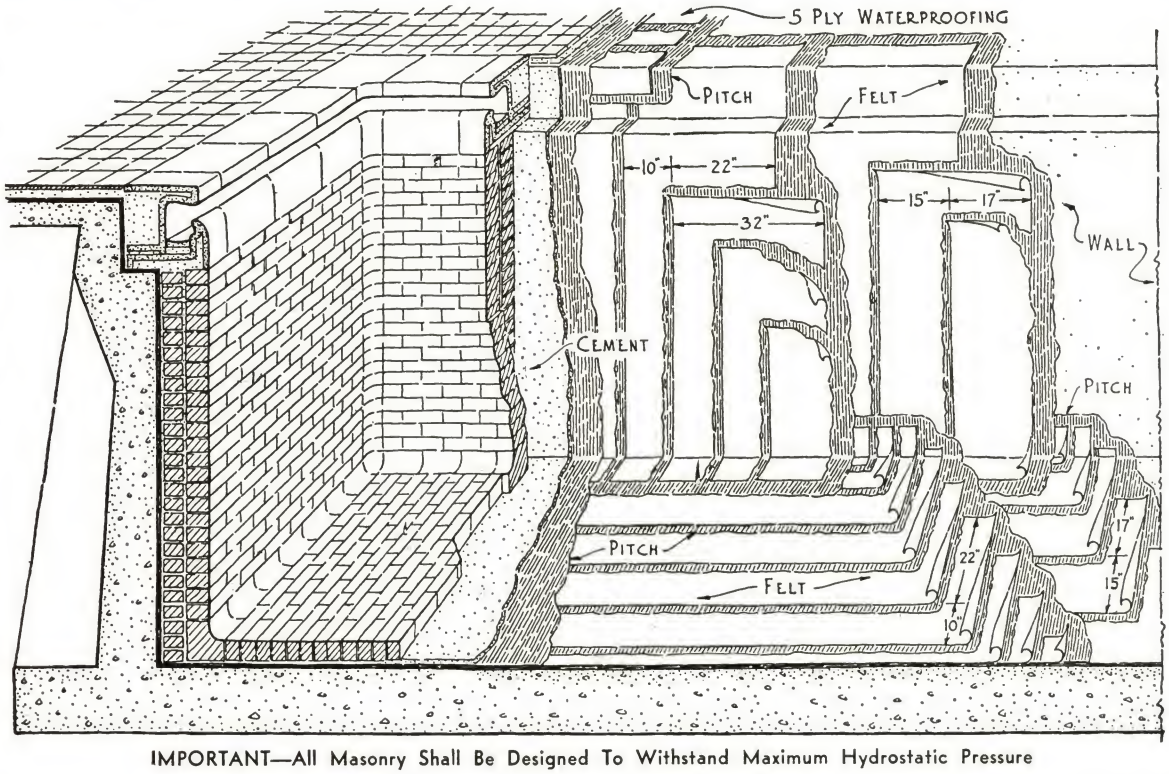
DETAIL FOR 4 PLY CONSTRUCTION

Barrett

BARRETT WATERPROOFING SYSTEM

MEMBRANE METHOD

FOR SWIMMING POOLS, SHOWER ROOMS ETC.



IMPORTANT—All Masonry Shall Be Designed To Withstand Maximum Hydrostatic Pressure

SPECIFICATIONS

The waterproofing shall be applied by a waterproofing contractor approved by THE BARRETT COMPANY, who has had experience in successfully applying this type of built-up waterproofing on swimming pool construction and who can refer to work of a similar nature that he has executed in a satisfactory manner.

All surfaces on which the waterproofing is to be applied shall be firm, smooth and dry, and free from loose materials, and shall be covered by a membrane of continuous waterproofing consisting of five (5) plies of Specification Tarred Felt and six (6) moppings of Specification Pitch.

FIRST—Coat the entire surface on which the waterproofing is to be applied with Specification Pitch into which, while hot, lay two (2) plies of Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Specification Pitch the full seventeen (17) inch lap on each sheet, so that in no place shall Felt touch Felt.

SECOND—Coat the entire surface uniformly with Specification Pitch into which, while hot, lay three (3) plies of Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Specification Pitch the full twenty-two (22) inch lap on each sheet, so that in no place shall Felt touch Felt. All Felt shall be thoroughly and smoothly embedded into the hot Pitch, shall be laid without wrinkles or buckles, and the finished membrane shall be free from pockets or blisters.

THIRD—Coat the entire surface with a heavy uniform mopping of Specification Pitch.

FOURTH—Not less than two hundred and ten (210) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing and the Pitch shall not be heated above four hundred (400) degrees, Fahrenheit.

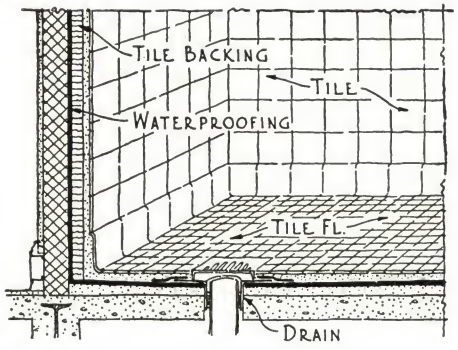
FIFTH—At wall angles and footings and places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

SIXTH—Where laps are left to be connected, they shall be not less than ten (10) inches wide and shall be temporarily protected by one-half (½) inch troweled course of Portland Cement Mortar. When connections with laps are made, laps shall be carefully cleaned, dry, and mopped with Pitch before proceeding with the work.

SEVENTH—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent protective finish.

EIGHTH—The waterproofing shall be immediately protected by tile, brick, concrete or similar material (as specified) and a continuous course of at least one-half (½) inch of cement mortar, one to two mix, applied directly over the waterproofing membrane before such finished course is installed.

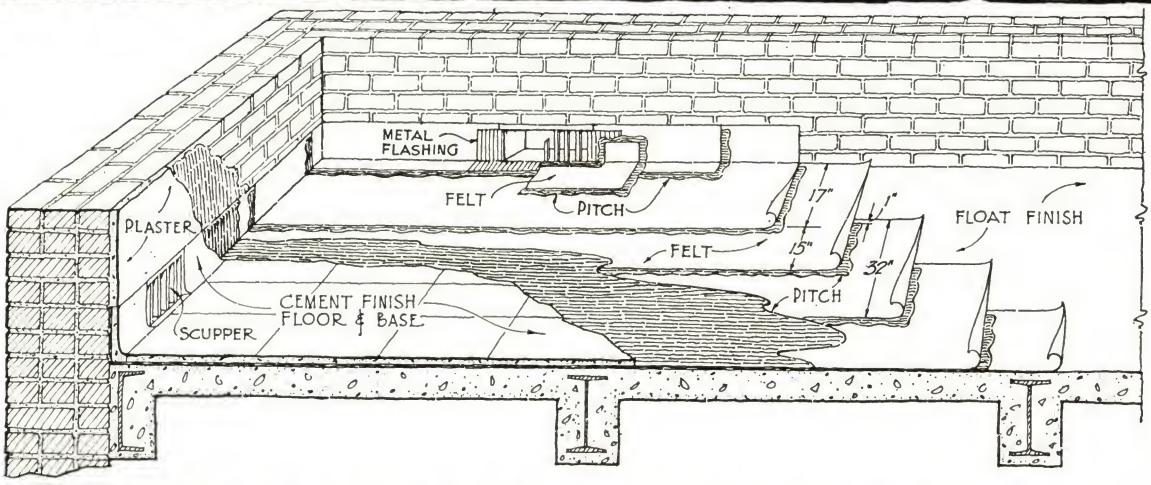
Note—Where swimming pool is provided with steam coil or hot water inlet, all such pipes shall be thoroughly insulated.



DETAIL FOR SHOWER ROOM

Barrett

BARRETT WATERPROOFING SYSTEM
MEMBRANE METHOD
FOR SUPERSTRUCTURE, CONCRETE OR WOOD FLOORS



This System of Waterproofing is Designed for the Purpose of Providing a Factor of Safety Against Water Damage From Operation of Sprinkling System, or in Case of Fire, Washing of Floors, etc.

SPECIFICATION

First—Over the entire surface lay two (2) plies of Specification Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Specification Pitch the full seventeen (17) inch lap on each sheet, so that at no place, shall Felt touch Felt; after which spread over the entire surface a heavy uniform coating of Specification Pitch.

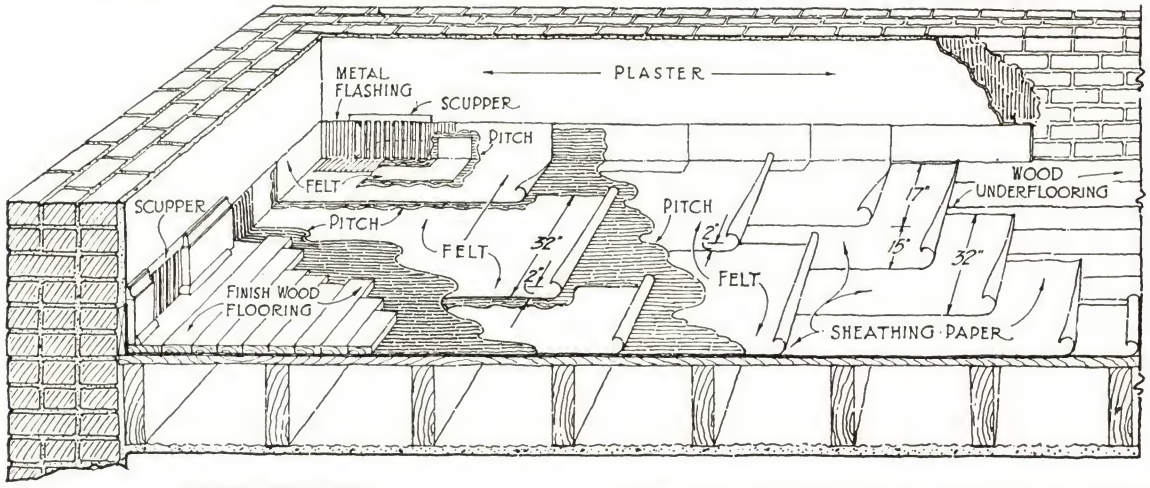
Second—Not less than seventy-five (75) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

Third—At places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

Fourth—Felt and Pitch membrane shall be carried up walls and areas around columns, pipes, etc., not less than three (3) inches above the finished flooring, and shall be properly fastened in place and protected.

Fifth—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent finished flooring.

Sixth—The waterproofing shall be immediately protected by the application of the finished flooring as specified.



SPECIFICATION

First—Over the entire surface lay two (2) thicknesses of sheathing paper or unsaturated felt, weighing not less than five (5) pounds per one hundred (100) square feet, lapping each sheet seventeen (17) inches over the preceding one, and nail as often as is necessary to hold in place.

Second—Over the entire surface lay one (1) ply of Specification Felt, lapping each sheet two (2) inches over preceding one and nail as often as is necessary to hold in place.

Third—Coat the entire surface uniformly with Specification Pitch, after which over the entire surface lay one (1) ply of Specification Felt, lapping each sheet two (2) inches over preceding one, and mopping the two (2) inch lap on each sheet with Specification Pitch, so that no places shall Felt touch Felt. Care shall be taken that all layers of Felt break joints with underlying layers.

Fourth—Over the entire surface spread a heavy uniform coating of Specification Pitch, into which, while hot, embed floor plank.

Fifth—Not less than seventy-five (75) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the Pitch shall not be heated above four hundred (400) degrees, Fahrenheit.

Sixth—(Same as paragraph "Third" at top of page.)

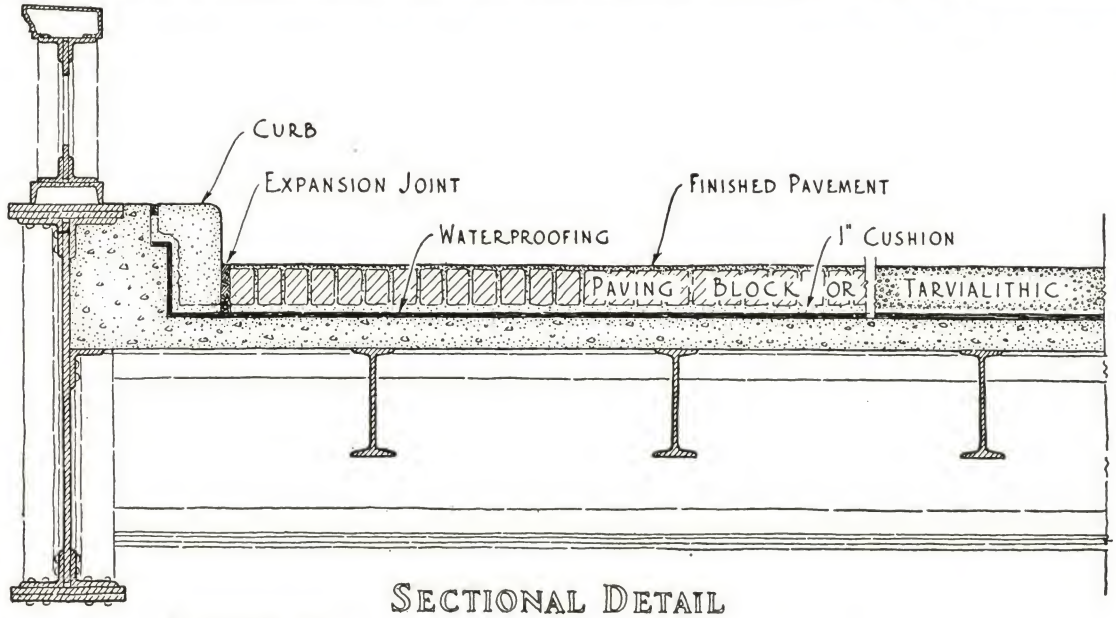
Seventh—(Same as paragraph "Fourth" at top of page.)

Eighth—(Same as paragraph "Fifth" at top of page.)

Ninth—The waterproofing shall be immediately protected by the application of the finished flooring as specified. Each plank shall be set in permanent position before nailing to prevent the nails from tearing the waterproofing membrane, and in no case shall the nails penetrate the flooring upon which the waterproofing rests.

Barrett

BARRETT WATERPROOFING SYSTEM
MEMBRANE METHOD
FOR ELEVATED HIGHWAYS OR BRIDGES, RAMPS ETC



SECTIONAL DETAIL

SPECIFICATION

The waterproofing shall be applied by a Waterproofing Contractor approved by THE BARRETT COMPANY, who has had experience in successfully applying this type of Built-Up Waterproofing, and who can refer to work of a similar nature that he has executed in a satisfactory manner.

All surfaces on which the waterproofing is to be applied shall be firm, smooth, dry, and free from loose materials, and shall be covered by a membrane of continuous waterproofing consisting of ..... plies of Specification Tarred Felt and ..... moppings of Specification Waterproofing Pitch.

First—Coat the entire surface on which the waterproofing is to be applied, with Specification Waterproofing Pitch, into which, while hot, embed a layer of Specification Felt, following this with alternating moppings of Pitch and layers of Felt until ..... moppings of Pitch and ..... layers of Felt have been applied. Each layer of Felt shall be thoroughly rubbed into the hot Pitch, and the entire surface shall be immediately mopped with Pitch to insure thorough embedment of the Felt. The Felt shall be laid without wrinkles or buckles, and the finished membrane shall be free from pockets or blisters.

Second—Spread over the entire surface a heavy uniform coating of Specification Waterproofing Pitch.

Third—Not less than .....* pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the Pitch shall not be heated above three hundred fifty (350) degrees Fahrenheit.

Fourth—At wall angles, curbs, deflection joints, and places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

Fifth—Where laps are left to be connected, they shall be not less than ten (10) inches wide and shall be temporarily protected by one-half (½) inch troweled coarse of Portland Cement Mortar. When connections with laps are made, laps shall be carefully cleaned, dry, and mopped with Pitch before proceeding with the work.

Sixth—Felt and Pitch membrane shall be carried up curbs, walls, and areas around columns, pipes, etc., not less than four (4) inches above the finished wearing surface.

Seventh—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent finished wearing surface.

Eighth—The finished wearing surface as specified, shall be immediately installed over the waterproofing membrane.

NOTES

1. Expansion joints shall be provided throughout the finished wearing surface. All such expansion joints shall extend from the top of the finished wearing surface through to the waterproofing membrane.

2. Where outlets or scuppers are provided as indicated on drawings, they shall be placed level with the waterproofing coarse and properly Felt-stripped.

**Architects' Note*—For five (5) ply construction, Felt shall be laid after the two (2), two (2) and one (1) method, with alternating moppings of Waterproofing Pitch throughout. Not less than two hundred ten (210) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed Waterproofing.

For four (4) ply construction not less than one hundred seventy-five (175) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed Waterproofing.

Barrett

BARRETT DAMPPROOFING SYSTEM
FOR RETAINING WALLS, ABUTMENTS, MASONRY WALLS ETC.

For Abutments and Foundations of Brick or Concrete Masonry Where Back-fill is Provided

SPECIFICATION

All surfaces to be dampproofed shall be dry and clean and free from dirt, dust or foreign materials. All voids, cracks or open joints in the masonry shall be properly pointed up with Portland Cement Mortar before application of the dampproofing materials.

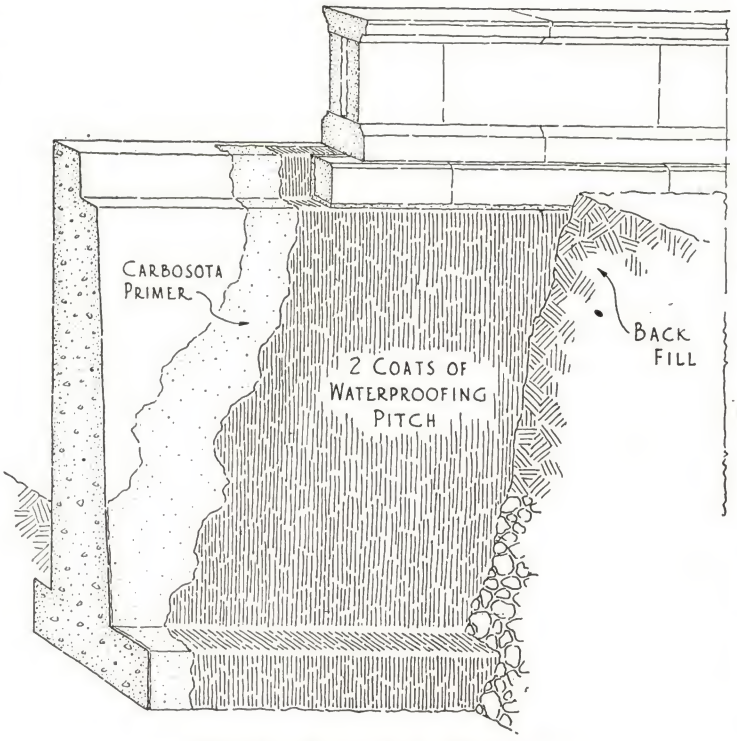
First—Apply over the entire surface to be dampproofed, a uniform prime coating of Barrett Carbosota, Grade 1, Creosote Oil.

Second—The priming coat of Carbosota shall be allowed to sufficiently penetrate the masonry, and before thoroughly dry, apply a uniform mop coating of Specification Waterproofing Pitch. The Pitch shall be applied in such manner as will obtain a heavy continuous coating of Waterproofing Pitch over the entire surface, filling all cracks, voids and crevices and upon completion shall present a dry, glossy appearance.

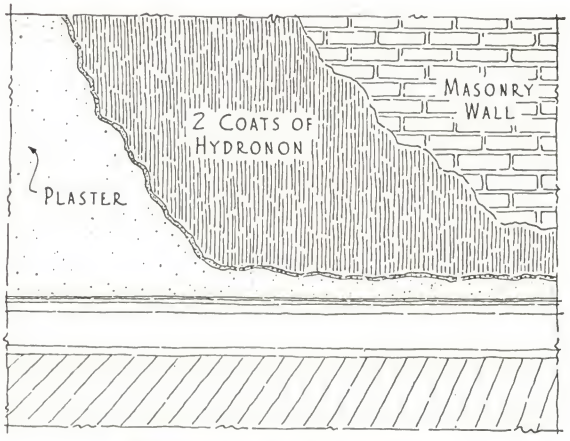
Third—After the entire surface has been completely covered with first mopping, follow immediately with second heavy uniform mopping of Specification Waterproofing Pitch.

Fourth—Not less than one (1) gallon of Carbosota and eighty (80) pounds of Waterproofing Pitch shall be used for each one hundred (100) square feet of completed dampproofing and the Pitch shall not be heated above three hundred and eighty (380) degrees Fahrenheit.

Fifth—Dampproofing shall be immediately covered with permanent back-fill, solidly tamped in place.



PITCH COATING METHOD



HYDRONON METHOD

Hydronon Method—For Brush Treatments

SPECIFICATION

All surfaces to be dampproofed shall be dry and clean and free from dirt, dust or foreign materials. All voids, cracks or open joints in the masonry shall be properly pointed up with Portland Cement Mortar before dampproofing material is applied.

First—Over all wall surfaces to be dampproofed, apply two coats of Barrett Hydronon Dampproofing Paint. The first coat shall be well brushed into the surface in such manner as will fill all voids and crevices and shall be allowed to dry for at least twelve (12) hours before application of the second coat.

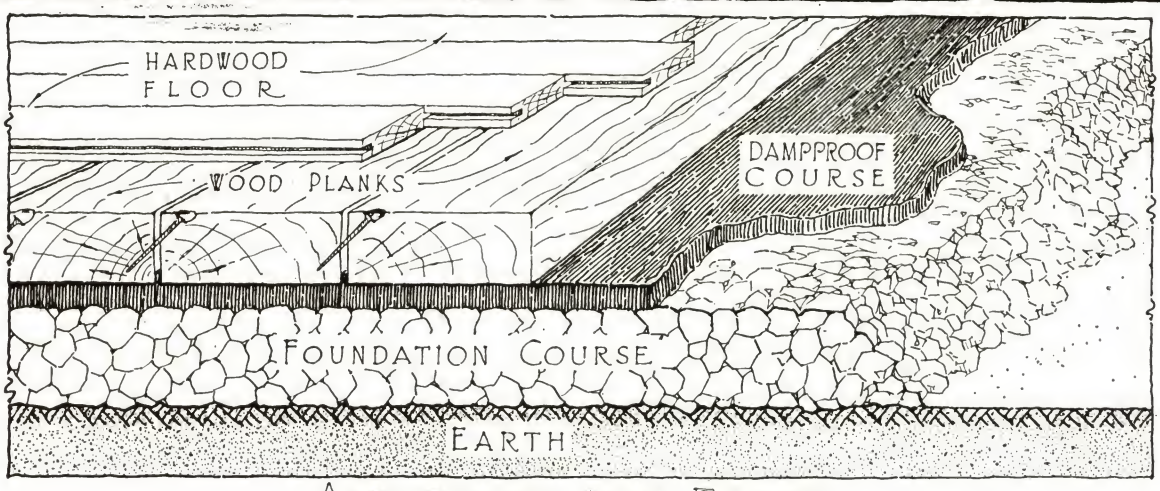
Second—The second coat of Hydronon shall be applied in a free and even manner so that a smooth and glossy finish is provided at all points.

NOTE

1. Where dampproofed walls are to receive a coating of plaster laid directly over the dampproofing course, plaster shall be applied while the Hydronon Dampproofing is still slightly tacky. Walls to be plastered shall provide satisfactory key for the plaster bond.

Barrett

BARRETT DAMPPROOFING SYSTEM
TAR-ROK METHOD
OVER CONCRETE BASE SLAB OR EARTH



APPLICATION OVER EARTH

SPECIFICATION

Grading—The general contractor for the building shall level off the earth to proper grade to receive the Tar-Rok, and if any filling is necessary it shall be properly puddled and rammed.

Foundation Course—The foundation course shall consist of four (4) inches thickness of screened gravel or crushed stone, not any of which shall exceed two and one-half (2½) inches in longest dimension or be less than one-quarter (¼) inch in size, mixed with sufficient Barrett Sub-Floor Tar No. 5 (as specified) so that it will compact under a roller after being spread evenly in place. It shall then be rolled until the stones do not creep under the roller. The Tar for this course may be heated to not more than two hundred (200) degrees F., and in cold weather the stone shall be slightly warmed if necessary, so that the Tar will mix with the stone and the stone spread evenly. The roller used for this work shall weigh not less than three hundred (300) pounds to each foot in length. Sub-Floor Tar used in foundation course shall be approximately (See Note 1):

Six (6) gallons for each cubic yard of two and one-half (2½) inches to one (1) inch crushed stone;

Nine (9) gallons for each cubic yard of two and one-half (2½) inches to one-quarter (¼) inch crushed stone;

Seven (7) gallons for each cubic yard of coarse-screened gravel;

Ten (10) gallons for each cubic yard of fine-screened gravel.

Note 1—Only sufficient Tar should be used so that the stone or gravel will properly compact and provide a suitable surface for spreading the dampproof course.

Dampproof Course—The dampproof course shall consist of a fine sand and thoroughly mixed with Barrett Sub-Floor Tar No. 7 in the proportion of not less than twenty-five (25) nor more than thirty (30) gallons of Tar to each cubic yard of sand. The sand shall be thoroughly dry before mixing, and both sand and Tar shall be heated sufficiently to make them mix freely, but neither sand nor Tar shall be hotter than two hundred twenty-five (225) degrees F., when being mixed together. If a thick, white smoke arises from the mixture, indicating it is overheated, five (5) gallons more Tar to each yard of sand shall be required. This mixture shall be spread evenly one and one-quarter (1¼) to one and one-half (1½) inches thick (so it will compact to one (1) inch) over the foundation, leveled with straight-edge, and followed closely with plank.

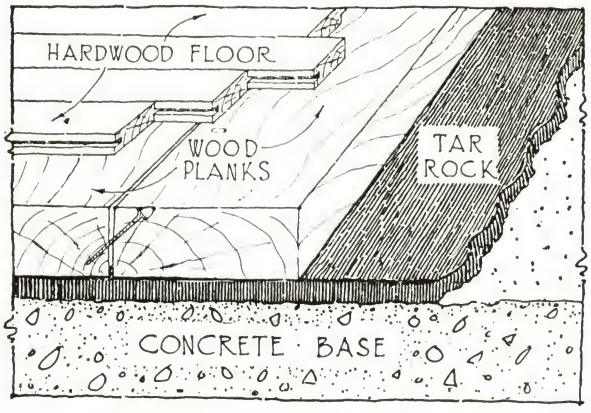
The plank shall be laid on this soft mixture, and bedded on it by hammering until the proper stability is obtained and the plank brought to a proper level and toe-nailed. If after hammering any plank is below the proper level, the plank shall be taken up and more of the mixture spread on. (The plank and finished flooring shall be furnished and laid by other contractors.)

SPECIFICATION

The general contractor for the building shall level off the concrete to proper grade to receive the Tar-Rok Dampproof course.

Dampproof Course—The dampproof course shall consist of a fine sand thoroughly mixed with Barrett Sub-Floor Tar No. 7 in the proportion of not less than twenty-five (25) nor more than thirty (30) gallons of Tar to each cubic yard of sand. The sand shall be thoroughly dry before mixing, and both sand and Tar shall be heated sufficiently to make them mix freely, but neither sand nor Tar shall be hotter than two two hundred twenty-five (225) degrees Fahrenheit when being mixed together. If a thick, white smoke arises from the mixture, indicating it is overheated, five (5) gallons more Tar to each yard of sand shall be required. This mixture shall be spread evenly one and one-quarter (1¼) inches to one and one-half (1½) inches thick (so it will compact to one (1) inch) over the foundation, leveled with a straight-edge, and followed closely with dry, well seasoned plank.

The plank shall be laid on this soft mixture, and bedded on it by hammering until the proper stability is obtained and the plank brought to a proper level and toe-nailed. If after hammering, any plank is below the proper level, the plank shall be taken up and more of the mixture spread on. (The plank and finished flooring shall be furnished and laid by other contractors.)



APPLICATION OVER CONCRETE

Barrett

The Barrett Company

40 Rector Street
New York, N. Y.

BIRD & SON, inc.

Built-Up and Roll Roofings

EAST WALPOLE, MASS.

CHICAGO OFFICE AND PLANT: 1472 West 76th Street — NEW YORK OFFICE: 295 Fifth Avenue

CANADA: Building Products Ltd., Bird & Son Division, HAMILTON, ONTARIO

For our pages on Asphalt Shingles, Insulating Board, and Building Paper, see Manufacturers' Index

Bird Paroid Built-Up Roof

Bird Paroid *Built-Up Roof,* built up of successive layers of asphalt felt, asphalt compound applied hot, and Paroid Cap Sheet, gives a heavy impenetrable mass of absolutely weatherproof materials, capped with the well-known Paroid Smooth Surfaced Roofing. There is no slag or gravel to fall off and clog the gutters.

The illustration and specification which follow are for the most usual type of Paroid Built-Up Roof over sheathing boards. We will furnish on request specifications as follows:

(1) Bird Paroid Built-Up Roof, light, over sheathing boards.
(2) Bird Paroid Built-Up Roof, standard, over sheathing boards. (See specification below.)
(3) Bird Paroid Built-Up Roof, extra heavy, over sheathing boards.
(4) Bird Paroid Built-Up Roof, light, over non-combustible roof decks.
(5) Bird Paroid Built-Up Roof, standard, over non-combustible roof decks.
(6) Bird Paroid Built-Up Roof, extra heavy, over non-combustible roof decks.

Specifications for Bird Paroid Built-Up Roof, Standard for Application Over Sheathing—

Preparation of Sheathing—The roof shall be laid upon seasoned sheathing preferably tongued and grooved, not over 6 in. in width. All rubbish and projections shall be removed from the roof by the contractor preceding the roofer. The ends of all sheathing boards shall rest on rafters or purlins, properly nailed and secured. The sheathing shall be reasonably free from knots and holes, and where holes do occur these shall be covered with metal securely nailed. The roof shall be properly graded to outlets and all drainage connections set to permit the free flow of water. All this work to be done by the general contractor preceding the roofing contractor. Triangular wood strips about 2 in. high shall be installed by owner or general contractor in all angles formed by the roof and a vertical surface.

Flashings—All brick or concrete walls, etc., shall be primed with Bird Asphalt Primer before flashing with the roofing material. Where not otherwise shown on plans, walls and all elevations above the roof such as skylights, curbs, etc., shall be flashed at least 6 in. high. The flashings to be built up in the same manner and of the same material as the roof itself. Flashings shall be reinforced by a base flashing of Bird Cap Sheet 9 in. wide, mopped 6 in. up the wall and 3 in. on the roof. An approved metal counterflashing shall extend down over the wall flashing at least 4 in., and where pipes, vents, etc., come through the roof, they shall be flashed with a lead collar, both to be furnished and installed by the general contractor or owner.

Material—Materials required per 100 sq. ft. of completed roof surface—gross weights:

2 layers Bird 15-lb. Asphalt Felt (36-in. width)	31	lb.
2 layers Bird Built-Up Roof Compound	50	lb.
1 layer Bird Paroid Cap Sheet (coated one side only, 36-in. width)	37½	lb.
Flexible extra large head roofing nails (⅞ in. long)	1¼	lb.
Total weight of finished roof	119¾	lb.

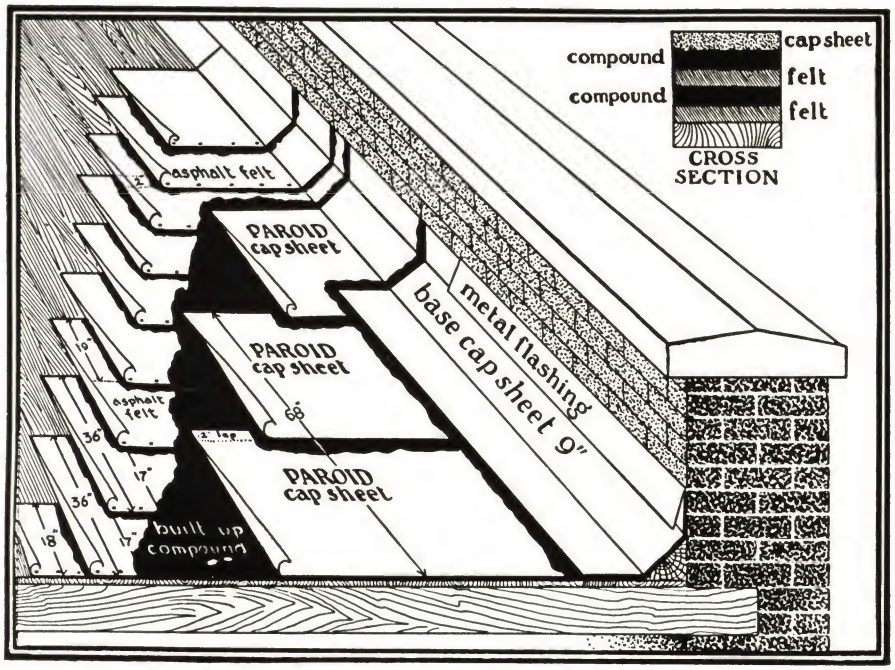
The quantities above stated do not include the material necessary for flashings nor do they include wastage.

Note: Many roofers recommend the use of a layer of sheathing paper to be used next to the sheathing boards. This is especially good over roof boards that contain pitch or sap.

Application—*First:* A sheet of Bird Asphalt Felt 18 in. wide shall be laid along the lowest edge of the roof. This felt shall be mopped with Bird Compound heated to not less than 400° F. and while hot a second sheet of asphalt felt 36 in. wide shall be rolled into same. Similarly succeeding sheets of asphalt felt 36 in. wide shall be laid lapping each sheet 19 in. until the surface of the roof shall be covered with two layers of asphalt felt mopped together with hot compound, so that felt does not touch felt. Flexible large head roofing nails shall be used, nailing 4 in. apart along the lower edge of each sheet, as applied.

Second: The Bird Asphalt Felt along the lower edge 36 in. wide shall be mopped with Bird Compound heated to not less than 400° F. and while hot a sheet of Bird Paroid Cap Sheet 36 in. wide rolled into same. The cap sheet must follow mop closely to insure a perfect bond. In a similar manner the second and succeeding sheets of Bird Cap Sheet 36 in. wide shall be mopped in, overlapping the preceding sheet 2 in. All cross laps of the cap sheet shall be mopped and lapped 4 in.

The surfaced side of Bird Cap Sheet shall be laid to the weather.



Bird Paroid Built-Up Roof, Standard Over Sheathing

Paroid Roll Roofing

Paroid Roll Roofing is of the highest quality, protected with a coating on both sides and with a special talc surfacing of bright gray color.

Paroid is most satisfactory for specifications for large roof surfaces, such as: barns, freight sheds, train platforms, garages, etc. It may also be specified for low pitch roofs on porches and dormers of all types of residences.

Paroid comes in rolls of either 108 or 216 sq. ft. with lap cement and nails. Made in two weights, 55 and 65 lb. per square. Roofer should apply according to directions enclosed in each roll.

JOHNS-MANVILLE

EXECUTIVE OFFICES
292 Madison Avenue, NEW YORK, N. Y.

For Branch Offices, see Section on Wall Tile

Products

JOHNS-MANVILLE BUILT-UP ROOFING.

Also Packings for all purposes; Refractory Cements; Waterproofing and Dampproofing; Asbestos Ebony; Asbestos and Asphalt Roll-roofing; Rotproof Roofs; Asbestos products of all kinds.

For the following Johns-Manville products, see Manufacturers' Index: Acoustical Treatment and Sound Isolation; Shingles; Home Insulation; Insulating Board and Insulating Lath; Insulations; Tile Flooring; Transite, Flat and Corrugated; Wall Tile.

JOHNS-MANVILLE BUILT-UP ROOFING

Realizing that no one type of built-up roofing can be acceptable or usable under all conditions and recognizing the factor of individual preference as to component materials, Johns-Manville is now in a position to furnish a built-up roofing to meet practically any condition or personal liking.

The various types are tabulated on following pages:

Construction

Johns-Manville Built-up Roofings are constructed of successive layers of either asphalt or tar saturated asbestos, or asphalt saturated rag, roofing felts, alternated with layers of either asphalt or pitch. The final surfacing varies, being either smooth or surfaced with slag, gravel or crushed slate.

Bonds

All Johns-Manville Built-up Roofings of whatever type will, when desired, be covered by a bond of the National Surety Company, guaranteeing the performance of the particular roof for a period of from ten to twenty years, depending on the type of roofing used. This bond is issued on roofings laid only by Johns-Manville Approved Roofing Contractors and in connection with Johns-Manville inspection service.

Where Johns-Manville Flashing Materials are used in conjunction with Johns-Manville Roofing, a flashing endorsement for a ten-year period will be attached to and become part of the bond, under the same conditions imposed for the bonding of the roofing.

Approved Roofing Contractors

Realizing that the best results are obtained only when the proper roofing is correctly laid, Johns-Manville has appointed Approved Roofing Contractors throughout the country, basing these appointments on thoroughness of workmanship and financial responsibility.

Inspection

Johns-Manville maintains a corps of inspectors whose services are available in connection with the bonded built-up roofings. This service is required in connection with every roof which is to be bonded and is rendered before, during, and after the work of application.

Insulation

The advantages of roof insulation are well established and accepted, such insulation alleviating or preventing condensation and reducing the passage of heat. Certain Johns-Manville Built-up Roofings, therefore, have been designed for application over approved rigid types of insulation such as J-M Rigid Roofinsul. Conference with representatives of the Johns-Manville Staff is suggested, prior to specification, to determine the advisable provisions.

Promenade Tile, etc.

Where promenade tile or a granolithic finish is desired, certain Johns-Manville Built-up Roofings have been designed for use under such treatment.

Underwriters' Rating

On the chart will be found the rating which the Underwriters' Laboratories, Inc., has given on certain types of roofing. This is an indication of their fire resisting properties.

SPECIFICATIONS

Individual standard specifications devoted to each particular type of built-up roofing on the charts on the following pages are available and will be furnished on request. The following condensed specification, however, may be used in the absence of the standard specification, inserting the required items where indicated to complete.

If sheet metal base and cap flashing is to be used, all reference to J-M flashing shall be omitted. If sheet metal is to be used only as cap flashing however, a complete installation of J-M base and cap flashing shall also be specified.

Where roof insulation is to be used, the extent to which felt is to be applied thereunder shall be specified as indicated. If high humidity and condensation conditions do not exist and the roof deck construction is of poured concrete, poured gypsum or steel, the application of felt to underlie the entire area of insulation may be omitted, applying it only at eaves and gable overhang. If roof insulation is not to be used reference thereto shall be omitted.

Condensed Specification

Roofing—Shall be Johns-Manville (*state Designation and Specification Number, see chart on the following pages.*) Built-up Roofing applied in accordance with the manufacturer's Standard Specification.

Flashing—Shall be Johns-Manville Flashing applied in accordance with the manufactutrer's Standard Specification. It shall be applied on parapet walls (*state whether "not less than 8" high" or "to extend full height and under coping" or "not less than 8" high with cap flashing extended through the wall").* It shall be applied on high walls (*state whether "same height as on adjoining parapet walls" or "not less than 8" high with cap flashing extended through the wall." If flashing is to be carried into raggle blocks, so state.*)

Roof Insulation—Shall be Johns-Manville Rigid Roofinsul (*state thickness*) thick applied in accordance with the manufacturer's Standard Specification. The insulation shall be underlaid with (*state whether "felt over the entire area" or "felt at all eaves and gable overhang"*).

Guarantee—(*If a bond is required add the following*:) The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville (*state term, see chart on the following pages*) Year Guaranty Bond.

(*If J-M Flashing is used, the following may be added*:) A ten-year flashing endorsement shall be attached thereto.

JOHNS-MANVILLE BUILT-UP ROOFINGS
EMPLOYING ASPHALT SATURATED ASBESTOS OR RAG FELTS

SPECIFICATION NUMBER	DESIGNATION	CONSTRUCTION OF DECK	LIMITATION OF ROOF PITCH **	SURFACE FINISH	TYPE OF ROOFING FELT INVOLVED	UNDERWRITERS LAB., INC. RATING	NUMBER OF PLIES OF FELT	NUMBER OF ASPHALT MOPPINGS	WEIGHT OF MATERIALS IN LBS PER SQUARE: FELTS	ASPHALT	ROOF COATING	GRAVEL SURFACING	SLAG SURFACING	TOTAL WEIGHT PER SQUARE: SURFACED SMOOTH OR WITH CRUSHED SLATE	GRAVEL SURFACED	SLAG SURFACED	TERM OF GUARANTY BOND - YEARS
FOR GENERAL PURPOSES																	
100	SUPER CLASS A	WOOD	¼" TO 9" PER FOOT	SMOOTH	ASBESTOS	A	ONE 60lb FELT AND THREE 20lb FELTS	3	120	90	8			218			20
101	CLASS A	NON-COMBUSTIBLE				A	ONE 60lb FELT AND TWO 20lb FELTS	3	100	90	8			198			20
103		WOOD				A		2	100	60	8			168			15
200	COMBINATION 45	WOOD			ASBESTOS AND RAG		ONE 45lb RAG FELT AND TWO 20lb ASBESTOS FELTS	2	85	60	8			153			15
201		NON-COMBUSTIBLE						3	85	90	8			183			15
202	COMBINATION 30	WOOD					ONE 30lb RAG FELT AND TWO 20lb ASBESTOS FELTS	2	70	60	8			138			10
203		NON-COMBUSTIBLE						3	70	90	8			168			10
300	5-WF	WOOD OR PRECAST GYPSUM	¼" TO 2" PER FOOT	GRAVEL OR SLAG	RAG	A	FIVE 15lb FELTS	4	75	160		400	300		635	535	20
301	5-WS		2" TO 4" PER FOOT	SLAG		A†		5	75	165			250			490	10
302	4-CF	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM	¼" TO 2" PER FOOT	GRAVEL OR SLAG		A	FOUR 15lb FELTS	5	60	190		400	300		650	550	20
303	4-CS		2" TO 4" PER FOOT	SLAG		A†		5	60	165			250			475	10
304	4-WF	WOOD OR PRECAST GYPSUM	¼" TO 2" PER FOOT	GRAVEL OR SLAG		A		3	60	130		400	300		590	490	15
305	3-CF	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM				A	THREE 15lb FELTS	4	45	160		400	300		605	505	15
FOR USE OVER ROOFINSUL* OR OTHER APPROVED RIGID INSULATION																	
104	4-A-I	WOOD	¼" TO 9" PER FOOT	SMOOTH	ASBESTOS	A	FOUR 20lb FELTS	4	80	120	8			208			20
105		NON-COMBUSTIBLE				A		4	80	120	8			208			20
108		STEEL	½" TO 9" PER FOOT			A		4	80	120	8			208			20
106	3-A-I	WOOD	¼" TO 9" PER FOOT			B	THREE 20lb FELTS	3	60	90	8			158			15
107		NON-COMBUSTIBLE				A		3	60	90	8			158			15
109		STEEL	½" TO 9" PER FOOT					3	60	90	8			158			15
FOR USE WHERE A CRUSHED SLATE FINISH IS DESIRED																	
400	SLATEKOTE	WOOD OR PRECAST GYPSUM	4" TO 9" PER FOOT	CRUSHED SLATE	RAG	C	TWO 15lb RAG FELTS AND TWO 50lb SLATEKOTE FELTS	2	130	60				190			10
401		NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM				C	ONE 15lb RAG FELT AND TWO 50lb SLATEKOTE FELTS	3	115	90				205			10
402		WOOD OR PRECAST GYPSUM	1" TO 4" PER FOOT			C	THREE 15lb RAG FELTS AND TWO 50lb SLATEKOTE FELTS	4	147	120				267			10
403		NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM				C		5	147	150				297			10
FOR USE UNDER PROMENADE TILE																	
112	4 A P	NON-COMBUSTIBLE	¼" TO ½" PER FOOT	SMOOTH	ASBESTOS	A	TWO PLIES ROSIN-SIZED PAPER AND FOUR 20lb ASBESTOS FELTS	5	80	160				240			20
204	COMBINATION 45				ASBESTOS AND RAG		TWO PLIES ROSIN-SIZED PAPER, ONE 45 lb RAG FELT AND TWO 20lb ASBESTOS FELTS	4	85	130				215			10
FOR USE UNDER GRANOLITHIC FINISH																	
114	SUPER CLASS A	NON-COMBUSTIBLE	¼" TO ½" PER FOOT	SMOOTH	ASBESTOS	A	2 PLY ROSIN-SIZED PAPER, 1-60lb FELT, 3-20lb FELTS & 2 ADDITIONAL PLIES OF ROSIN-SIZED PAPER.	5	120	165				285			10
FOR USE UNDER LIGHT FOOT TRAFFIC NOT WARRANTING THE COST OF PROMENADE TILE, ETC.																	
102	SUPER CLASS AF	WOOD	¼" TO 1" PER FOOT	SMOOTH	ASBESTOS	A	ONE 60lb FELT-THREE 20lb FELTS AND ONE 74lb EXTRA HEAVY FLEXSTONE FELT	4	194	120				314			20
102-A	CLASS AF	NON-COMBUSTIBLE				A	ONE 60lb FELT-TWO 20lb FELTS AND ONE 74lb EXTRA HEAVY FLEXSTONE FELT	4	174	120				294			20
FOR USE ON SPRAY DECKS																	
110	CLASS A WITH FABRIC	WOOD	¼" TO 2" PER FOOT	SMOOTH	ASBESTOS AND FABRIC		ONE 60lb FELT-ONE TYPE B ASPHALT SATURATED FABRIC AND TWO 20lb FELTS	4	111	115				226			10
111		NON-COMBUSTIBLE						5	111	145				256			10

* SPECIFICATION No. 500 [OVER WOOD], No. 501 [OVER NON-COMBUSTIBLE CONSTRUCTION] AND No. 502 [OVER STEEL] COVER THE APPLICATION OF J-M RIGID ROOFINSUL OVER THE VARIOUS TYPES OF ROOF DECK CONSTRUCTION DESIGNATED PREPARATORY TO RECEIVING THE ROOFING.

** ALTHOUGH CERTAIN J-M BUILT-UP ROOFINGS HAVE A DESIGNATED MINIMUM ROOF PITCH LIMITATION OF ¼" PER FOOT IT IS THE RECOMMENDATION OF JOHNS-MANVILLE THAT NO ROOF BE CONSTRUCTED WITH A PITCH LESS THAN ½" PER FOOT ··· PLEASE CONSULT WITH US IF A ROOF WITH LESS THAN ¼" PER FOOT PITCH IS INVOLVED

† CLASS A UNDERWRITERS RATING ON PITCHES UP TO AND INCLUDING THREE INCHES PER FOOT.

JOHNS-MANVILLE BUILT-UP ROOFINGS
EMPLOYING TAR SATURATED ASBESTOS FELTS

SPECIFICATION NUMBER	DESIGNATION	CONSTRUCTION OF DECK	LIMITATION OF ROOF PITCH *	SURFACE FINISH	TYPE OF ROOFING FELT INVOLVED	UNDERWRITERS LAB., INC., RATING	NUMBER OF PLIES OF FELT	NUMBER OF ASPHALT [A] MOPPINGS OR PITCH [P]	WEIGHT OF MATERIALS IN LBS. PER SQUARE: FELTS	WEIGHT OF MATERIALS IN LBS. PER SQUARE: ASPHALT [A] PITCH [P]	WEIGHT OF MATERIALS IN LBS. PER SQUARE: GRAVEL SURFACING	WEIGHT OF MATERIALS IN LBS. PER SQUARE: SLAG SURFACING	TOTAL WEIGHT PER SQUARE: SURFACED SMOOTH	TOTAL WEIGHT PER SQUARE: GRAVEL SURFACED	TOTAL WEIGHT PER SQUARE: SLAG SURFACED	TERM OF GUARANTY BOND YEARS
FOR GENERAL PURPOSES																
600	5-TWF	WOOD OR PRECAST GYPSUM	1/4" TO 2" PER FOOT	GRAVEL OR SLAG	TARRED ASBESTOS	A	ONE PLY ROSIN-SIZED PAPER [OVER WOOD ONLY] + FIVE 15lb. FELTS	P-4	81	P-150		400	300		631	531	20
601	5-TWS		2" TO 6" PER FOOT	SLAG		A†		P-4 A-1	81	P-60 A-45			250			436	10
602	4-TCF	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM	1/4" TO 2" PER FT. POURED GYPSUM 1/4" TO 1" PER FT. ON OTHERS	GRAVEL OR SLAG		A	FOUR 15lb. FELTS	P-5	65	P-200		400	300		665	565	20
603	4-TCS		2" TO 6" PER FOOT	SLAG		A†	FOUR 15lb. FELTS	P-4 A-1	65	P-65 A-45			250			425	10
604	4-TWF	WOOD OR PRECAST GYPSUM	1/4 TO 2" PER FOOT	GRAVEL OR SLAG		A	ONE PLY ROSIN-SIZED PAPER [OVER WOOD ONLY] + FOUR 15lb. FELTS	P-3	65	P-125		400	300		590	490	15
605	3-TCF	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM	1/4 TO 2" PER FT. POURED GYPSUM 1/4 TO 1" PER FT. ON OTHERS			A	THREE 15lb. FELTS	P-4	49	P-175		400	300		624	524	15
FOR USE OVER ROOFINSUL																
606	4-TIWF	WOOD OR PRECAST GYPSUM	1/4" TO 2" PER FOOT	GRAVEL OR SLAG	TARRED ASBESTOS	A	OVER INSULATION FOUR 15lb. FELTS	P-5	65	P-200		400	300		665	565	20
607	4-TICF	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM	1/4" TO 2" PER FT. POURED GYPSUM 1/4" TO 1" PER FT. ON OTHERS			A										
608	3-TIWF	WOOD OR PRECAST GYPSUM	1/4" TO 2" PER FOOT			B	OVER INSULATION THREE 15lb FELTS	P-4	49	P-175		400	300		624	524	15
609	3-TICF	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM	1/4" TO 2" PER FT. POURED GYPSUM 1/4" TO 1" PER FT. ON OTHERS			A										
610	4-TIWS	WOOD OR PRECAST GYPSUM	2" TO 6" PER FOOT	SLAG		A†	OVER INSULATION FOUR 15lb. FELTS	P-3 A-1	65	P-75 A-45			250			435	10
611	4-TICS	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM	2" TO 6" PER FT. POURED GYPSUM 1" TO 6" PER FT. ON OTHERS			A†										
FOR USE UNDER PROMENADE TILE																
612	5-TCPF	NON-COMBUSTIBLE UNDER PROMENADE TILE	1/4" TO 1" PER FOOT	SMOOTH	TARRED ASBESTOS	A	FIVE 15lb. FELTS	P-6	81	P-200				275			ON APPLICATION
FOR USE ON ROOFS INCLINED LESS THAN 1/4 PER FOOT																
613	4-TCL	NON-COMBUSTIBLE EXCEPT PRECAST GYPSUM	LESS THAN 1/4" PER FOOT	GRAVEL OR SLAG	TARRED ASBESTOS	A	FOUR 15lb. FELTS	P-5	65	P-200		400	300		665	565	20

* ALTHOUGH CERTAIN J-M BUILT-UP ROOFINGS HAVE A DESIGNATED MINIMUM ROOF PITCH LIMITATION OF 1/4" PER FOOT IT IS THE RECOMMENDATION OF JOHNS-MANVILLE THAT NO ROOF BE CONSTRUCTED WITH A PITCH LESS THAN 1/2" PER FOOT··· PLEASE CONSULT WITH US IF A ROOF WITH LESS THAN 1/4" PER FOOT PITCH IS INVOLVED. †CLASS A UNDERWRITERS RATING ON PITCHES UP TO AND INCLUDING THREE INCHES PER FOOT

THE PHILIP CAREY COMPANY

Manufacturers of Asbestos, Asphalt, Magnesia and Tar Products
LOCKLAND, CINCINNATI, OHIO

GENERAL OFFICES AND MAIN FACTORY: LOCKLAND, OHIO
OTHER FACTORIES: FRANKLIN, OHIO; ST. LOUIS, MISSOURI; and PLYMOUTH MEETING, PA.
ASBESTOS MINES: EAST BROUGHTON, QUEBEC

BRANCHES AND DISTRIBUTERS IN ALL PRINCIPAL CITIES
For Carey Shingles and Pipe Covering, see Manufacturers' Index

FOREWORD

At the request of hundreds of architects we have condensed the various types of CAREY BUILT-UP ROOFING SPECIFICATIONS in such a manner as to enable us to reproduce every type of roof construction in a complete, comprehensive manner in this issue of SWEET'S ARCHITECTURAL CATALOGUES.

Every essential type of built-up roof construction, with definite recommendations as to the service adaptability of each, is incorporated in CAREY'S TWELVE (12) MASTER BUILT-UP ROOFING SPECIFICATIONS. In specifying any one of the twelve Master Specifications the architect should always indicate, in addition to the Master Built-up Roofing Specification number, the type of roof construction desired, i. e., Types A, B, C or D. He should also indicate any special conditions listed under "General Requirements Applying to All Types," such as: bond period, deck treatment, requirements for steep deck application and roof surfacing, etc., applying to the particular job.

Note: *When application is to be over wood or gypsum decks select deck treatment in accordance with type of deck.*

The minimum requirements for every item entering into the construction of Carey Built-up Roofs are well known, nationally accepted standards, re-enforced with a definite tolerance in quality. These standards of quality are established, controlled, and maintained by Carey engineers, research laboratories, and extensive modern factory facilities.

Architects may specify the types of Carey Roofs described in this catalogue with confidence, for use on all standard types of deck construction, and they are invited to correspond with the Engineering Department of THE PHILIP CAREY COMPANY for recommendations as to the roofing or waterproofing construction especially adapted to special types of deck construction or special specifications to meet unusual service conditions.

The specifications cover the following types of construction:

Slag or Gravel Surfaced Roofs

Ten (10) and twenty (20)-year roof construction for application over all types of decks. Various types comprise:

Asphalt Saturated Rag Felt construction, slag or gravel surfaced.

Tar Saturated Rag Felt construction, slag or gravel surfaced.

Combination Asphalt Impregnated Asbestos and Asphalt Saturated Rag Felt construction, slag or gravel surfaced.

Combination Tar Impregnated Asbestos and Tar Saturated Rag Felt construction, slag or gravel surfaced.

Mineral Surfaced Roofs

Ten (10) and twenty (20)-year roof construction for application over all types of decks. Various types comprise:

Asphalt Saturated Rag Felt construction, mineral surfaced.

Combination Asphalt Impregnated Asbestos and Asphalt Saturated Rag Felt construction, mineral surfaced.

Asphalt Impregnated Asbestos Felt construction, mineral surfaced.

Asphalt Surfaced Roofs

Ten (10) and twenty (20)-year roof construction for application over all types of decks. Various types comprise:

Asphalt Impregnated Asbestos Felt construction, asphalt surfaced.

Asphalt Saturated Rag Felt construction, asphalt surfaced.

Combination Asphalt Impregnated Asbestos and Asphalt Saturated Rag Felt construction, asphalt surfaced.

The recommendations governing the adaptability of each type and the application details incorporated in each type of built-up roof are the results of over half a century of manufacturing and application experience and are given in the hope that architects will carefully consider the wisdom of each recommendation.

Permanent satisfaction in built-up roof construction can only be assured when the proper type is selected to meet existing service conditions. Three vital points to be carefully considered when specifying various types of roofs are:

(1) Incline in roof deck and type of roof deck.

(2) Climatic conditions affecting the geographic location of the job.

(3) Presence of industrial gases and fumes detrimental to certain types of roof construction.

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CAREY 20-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 1

Comprising Four Optional Types—5 Ply, Slag or Gravel Surface Over Wood or Gypsum Decks

GENERAL CHARACTERISTICS

The following characteristics are common to all four types of roofs covered by Carey Master Built-up Roofing Specification No. 1:

The construction of each type consists of five (5) sheets of CAREY 15-LB. FELT, lapped in such a manner as to provide five-ply construction.

The surface of each roof is covered with a flood coat of hot bitumen poured from a dipper into which, while hot, is embedded *Slag or Gravel.*

Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ in. to 2 ins. in 12 ins. (except where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 1—Type A roof consists of five plies of CAREY FELTEX (Asphalt Saturated Rag Felt). Two sheets are laid dry as a base and three top sheets are bonded to the surface thus provided, and together, in laminated form with hot CAREY ASPHALT and surfaced with Asphalt and Slag or Gravel.

Type B

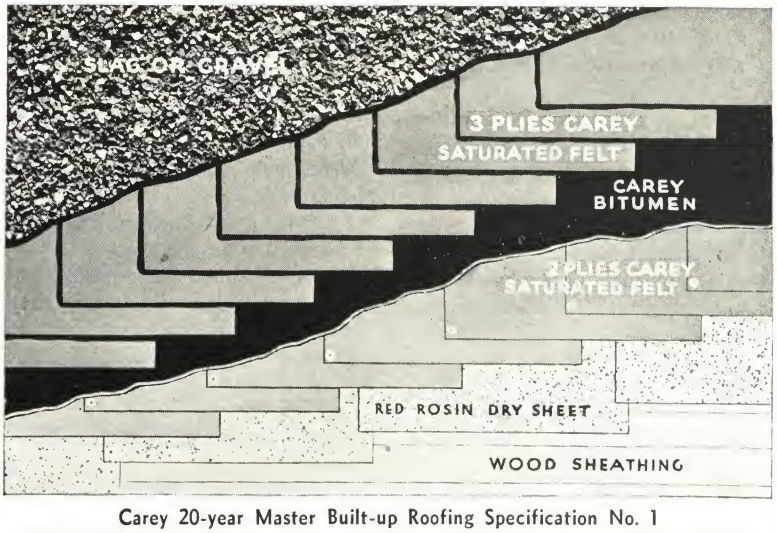
Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ in. in 12 ins. (except where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 1—Type B roof consists of five plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt). Two sheets are laid dry and three top sheets are bonded both to the surface thus provided and together, in laminated form, with hot CAREY-SEAL TAR PITCH, and surfaced with Tar, Pitch and Slag or Gravel.

Type C

Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ in. to 2 ins. in 12 ins. (adapted for use where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 1—Type C roof consists of five plies of CAREY FELT. Two sheets of CAREY FELTEX (Asphalt Saturated Rag Felt) are laid dry as a base and three top sheets of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt) are bonded to the surface thus provided, and together, in laminated form with hot CAREY ASPHALT and surfaced with Asphalt and Slag or Gravel.



Carey 20-year Master Built-up Roofing Specification No. 1

The above drawing illustrates the construction to be followed in applying all types of built-up roofs covered by Carey Master Built-up Roofing Specification No. 1, for application over *wood sheathing.*

When the various types of construction under Carey Master Built-up Roofing Specification No. 1 are applied over gypsum decks the Red Rosin Dry Sheet is omitted and the two plies of CAREY SATURATED FELT to be laid dry are applied directly over the *gypsum deck* and secured to same with nails as indicated.

Type D

Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ in. in 12 ins. (adapted for use where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 1—Type D roof consists of five plies of CAREY FELT. Two sheets of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt) are laid dry as a base and three top sheets of CAREY ASBESTOS FELT (Tar Impregnated) are bonded both to the surface thus provided, and together, in laminated form, with hot CAREY-SEAL TAR PITCH and surfaced with Tar Pitch and Slag or Gravel.

CAREY MASTER SPECIFICATION NO. 1

General Requirements Applying to All Four Types

Roof Surfacing

The size of Slag or Gravel used for surfacing the roof shall range from ¼ in. to ⅝ in. and be clean, dry and free from dirt. When applied in extreme cold weather same shall be warmed to eliminate frost. Not less than 400 lbs. of Gravel or 300 lbs. of Slag shall be used for covering each 100 sq. ft. of roof surface.

Deck Treatment

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris, and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Note: *Select one of the following paragraphs in accordance with type of deck.*

Wood Decks—Before the Built-up Roofing Specification is applied the deck shall be covered with a layer of Red Rosin Sized Sheathing weighing not less than 5 lbs. per 100 sq. ft., same to be lapped approximately 2 ins. and secured to the deck by occasional nailing.

Nails to be used in securing the Built-up Roofing Specification in the manner described under "Material and Application Details" shall be either 1-in. roofing nails driven through flat tin caps, or 1-in. "Simplex" nails.

Gypsum Decks—The first two sheets to be laid dry as called for in the Built-up Roofing Specification shall be applied directly over the gypsum deck and be secured to same as indicated under "Material and Application Details" with 1¾-in. roofing nails driven through flat tin caps, or 1¾-in. "Simplex" nails.

Requirements for Bond

Note: *All types of roofs under Carey Master Built-up Roofing Specification No. 1 are subject to a Carey 20-year Surety Bond when the roof is laid strictly according to Carey Specifications by roofing contractor approved by* THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 50 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 1—Type A

Five plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 135 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 1—Type A.

The felts used in the construction of the roof shall be 36 ins. wide. The first two sheets shall be laid dry, lapped 19 ins. leaving 17 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a mopping of asphalt shall be applied into which, while hot, shall be embedded three sheets of felt, each sheet to overlap the previous sheet 25 ins. leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the plies of this three-ply construction so that at no point shall felt touch felt.

To the top surface of this construction a flood coat of hot Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood of Asphalt, while hot, Slag or Gravel shall be embedded. Asphalt shall not be heated over 400° F.

Specification No. 1—Type B

Five plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 150 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 1—Type B.

The felts used in the construction of this roof shall be 32 ins. wide. The first two sheets shall be laid dry, lapped 17 ins. leaving 15 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a mopping of Tar Pitch shall be applied into which, while hot, shall be embedded three sheets of felt, each sheet to overlap the previous sheet 22 ins. leaving 10 ins. exposed. Solid moppings of Tar Pitch shall be applied between the plies of this three-ply construction so that at no point shall felt touch felt.

To the top surface of this construction a flood coat of hot Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. Tar Pitch shall not be heated over 400° F.

Specification No. 1—Type C

Two plies of CAREY FELTEX (Asphalt Saturated Rag Felt) and three plies of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 135 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 1—Type C.

The felts used in the construction of the roof shall be 36 ins. wide. The first two plies shall be CAREY FELTEX laid dry and lapped 19 ins. leaving 17 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a mopping of Asphalt shall be applied into which, while hot, shall be embedded three plies of CAREY FIBEROCK, each sheet to overlap the previous sheet 25 ins. leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the plies of this three-ply construction so that at no point shall felt touch felt.

To the top surface of this construction a flood coat of hot Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. Asphalt shall not be heated over 400° F.

Specification No. 1—Type D

Two plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt) and three plies of CAREY ASBESTOS FELT (Tar Impregnated), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 150 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 1—Type D.

The two plies of CAREY-SEAL TARRED FELT used in the construction of the roof shall be 32 ins. wide and the three plies of CAREY ASBESTOS FELT shall be 36 ins. wide. The first two plies of CAREY-SEAL TARRED FELT shall be laid dry, lapped 17 ins. leaving 15 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a mopping of Tar Pitch shall be applied into which, while hot, shall be embedded three plies of CAREY ASBESTOS FELT, each sheet to overlap the previous sheet 25 ins. leaving 11 ins. exposed. Solid moppings of Tar Pitch shall be applied between the plies of this three-ply construction so that at no point shall felt touch felt. To the top surface of this construction a flood coat of hot Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. Tar Pitch shall not be heated over 400° F.

CAREY 10-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 2

Comprising Four Optional Types—4 Ply, Slag or Gravel Surface Over Wood or Gypsum Decks

GENERAL CHARACTERISTICS

The following characteristics are common to all four types of roofs covered by Carey Master Built-up Roofing Specification No. 2:

The construction of each type consists of four (4) sheets of CAREY 15-LB. FELT, lapped in such a manner as to provide four-ply construction.

The surface of each roof is covered with a flood coat of hot bitumen poured from a dipper, into which, while hot, is embedded *Slag or Gravel.*

Character of felts, bitumen, and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ to 2 ins. in 12 ins. (except where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 2—Type A roof consists of four plies of CAREY FELTEX (Asphalt Saturated Rag Felt). Two sheets are laid dry as a base and two top sheets are bonded both to the surface thus provided, and together, in laminated form, with hot CAREY ASPHALT, and surfaced with Asphalt and Slag or Gravel.

Type B

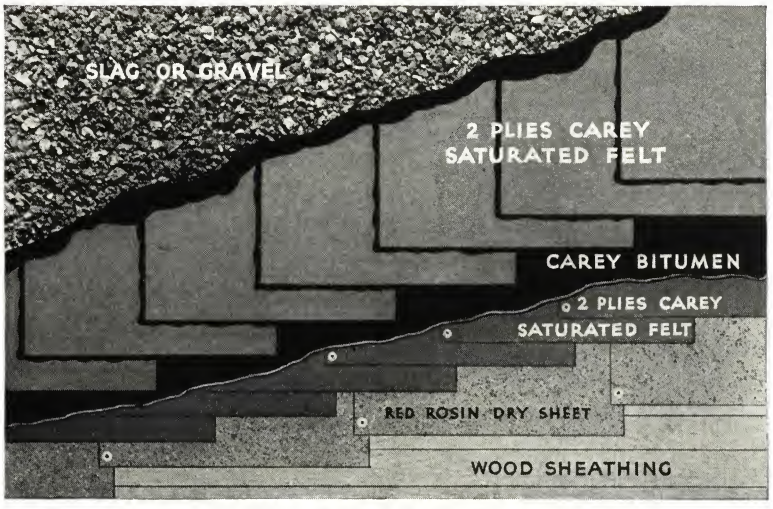
Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ ins. in 12 ins. (except where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 2—Type B roof consists of four plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt). Two sheets are laid dry and two top sheets are bonded both to the surface thus provided, and together, in laminated form, with hot CAREY-SEAL TAR PITCH, and surfaced with Tar Pitch and Slag or Gravel.

Type C

Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ to 2 ins. in 12 ins. (adapted for use where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 2—Type C roof consists of four plies of CAREY FELT. Two sheets of CAREY FELTEX (Asphalt Saturated Rag Felt) are laid dry as a base and two top sheets of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt) are bonded both to the surface thus provided, and together, in laminated form, with hot CAREY ASPHALT, and surfaced with Asphalt and Slag or Gravel.



Carey 10-year Master Built-up Roofing Specification No. 2

The construction to be followed in applying all Built-up Roofing covered by Carey Master Built-up Specification No. 2 for application over *wood sheathing.*

When the various types of construction under Carey Master Built-up Roofing Specification No. 2 are applied over gypsum decks, the Red Rosin Dry Sheet is omitted and the two piles of CAREY SATURATED FELT to be laid dry are applied directly over *gypsum deck* secured to same with nails as indicated

Type D

Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ ins. in 12 ins. (adapted for use where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 2—Type D roof consists of four plies of CAREY FELT. Two sheets of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt) are laid dry as a base and two top sheets of CAREY ASBESTOS FELT (Tar Impregnated Asbestos Felt) are bonded both to the surface thus provided, and together, in laminated form, with hot CAREY-SEAL TAR PITCH, and surfaced with Tar Pitch and Slag or Gravel.

CAREY MASTER SPECIFICATION NO. 2

General Requirements Applying to All Four Types

Roof Surfacing

The size of Slag or Gravel used for surfacing the roof shall range from ¼ in. to ⅝ in. and be clean, dry and free from dirt. When applied in extreme cold weather same shall be warmed to eliminate frost. Not less than 400 lbs. of Gravel or 300 lbs. of Slag shall be used for covering each 100 sq. ft. of roof surface.

Deck Treatment

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris, and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Note: *Select one of the following paragraphs in accordance with type of deck.*

Wood Decks—Before the Built-up Roofing Specification is applied the deck shall be covered with a layer of Red Rosin Sized Sheathing, weighing not less than 5 lbs. per square, same to be lapped approximately 2 inches and secured to the deck by occasional nailing.

Nails to be used in securing the Built-up Roofing Specification in the manner described under "Material and Application Details" shall be either 1-in. roofing nails driven through flat tin caps or 1-in. "Simplex" nails.

Gypsum Decks—The first two sheets to be laid dry as called for in Built-up Roofing Specification shall be applied directly over the gypsum deck and secured to same as indicated under "Material and Application Details" with 1¾-in. roofing nails driven through flat tin caps or 1¾-in. "Simplex" nails.

Requirements for Bond

Note: *All types of roofs under Carey Master Built-up Roofing Specification No. 2 are subject to a Carey 10-year Surety Bond when the roof is laid strictly according to Carey Specifications by roofing contractor approved by* THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 25 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 20-Year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 2—Type A

Four plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 100 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 2—Type A.

The Feltex used in the construction of this roof shall be 36 ins. wide. The first two sheets shall be laid dry, lapped 19 ins., leaving 17 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a solid mopping of Asphalt shall be applied, into which, while hot, shall be embedded two sheets of felt, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the two top plies, so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. Asphalt shall not be heated over 400° F.

Specification No. 2—Type B

Four plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq ft., and not less than 125 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 2—Type B.

The CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. wide. The first two sheets shall be laid dry, lapped 17 ins., leaving 15 ins. exposed and secured to the deck by occasional nailing. To the surface thus provided a solid mopping of Tar Pitch shall be applied, into which, while hot, shall be embedded two sheets of felt, each sheet to overlap the previous sheet 17 ins., leaving 15 ins. exposed. Solid moppings of Tar Pitch shall be applied between the two top plies of felt so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. Tar Pitch shall not be heated over 400° F.

Specification No. 2—Type C

Two plies of CAREY FELTEX (Asphalt Saturated Rag Felt) and two plies of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 100 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Specification No. 2—Type C.

Felts used in the construction of roof shall be 36 ins. wide. The first two plies shall be CAREY FELTEX laid dry and lapped 19 ins., leaving 17 ins. exposed, and shall be secured to the deck by occasional nailing. To the surface thus provided a solid mopping of Asphalt shall be applied, into which, while hot, shall be embedded two plies of CAREY FIBEROCK, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the two top plies of Fiberock so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. Asphalt shall not be heated over 400° F.

Specification No. 2—Type D

Two plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt) and two plies of CAREY ASBESTOS FELT (Tar Impregnated Asbestos Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 125 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 2—Type D.

The two plies of CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. wide and two plies of CAREY ASBESTOS FELT shall be 36 ins. wide. The first two plies of CAREY-SEAL TARRED FELT shall be laid dry, lapped 17 ins., leaving 15 ins. exposed, and shall be secured to the deck by occasional nailing. To the surface thus provided a solid mopping of Tar Pitch shall be applied into which, while hot, shall be embedded two plies of CAREY ASBESTOS FELT, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Tar Pitch shall be applied between the two top plies so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. Tar Pitch shall not be heated over 400° F.

CAREY 20-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 3

Comprising Four Optional Types—4 Ply, Slag or Gravel Surface Over Concrete Decks

GENERAL CHARACTERISTICS

The following general characteristics are common to all four types of roofs covered by Carey Master Built-up Roofing Specification No. 3:

The construction of each type consists of four (4) sheets of CAREY 15-LB. FELT, lapped in such a manner as to provide four-ply construction.

The surface of each roof is covered with a flood coat of hot bitumen poured from a dipper, into which, while hot, *Slag or Gravel* is embedded.

Character of felts, bitumen, and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

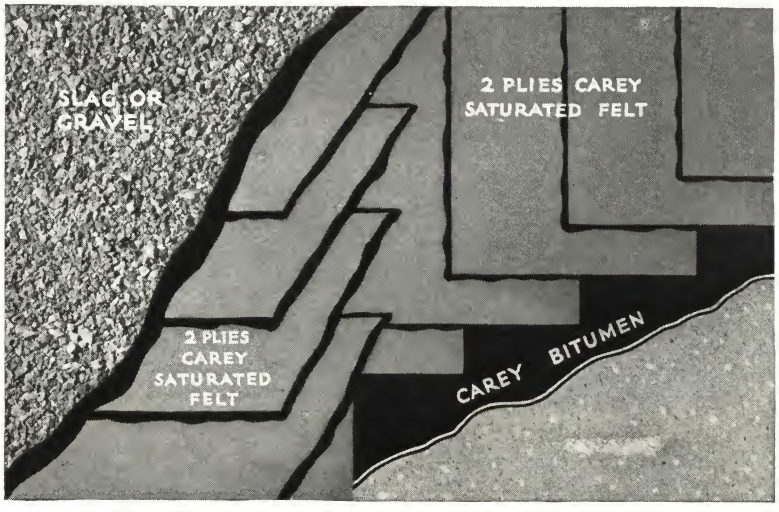
Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ to 1½ ins. in 12 ins. (except where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 3—Type A roof consists of four plies of CAREY FELTEX (Asphalt Saturated Rag Felt). Two sheets of Feltex are bonded to the deck and together as a base with Asphalt, and two additional top sheets of CAREY FELTEX are bonded both to the surface thus provided, and together, with hot CAREY ASPHALT, and surfaced with Asphalt and Slag or Gravel.

Type B

Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ in. in 12 ins. (except where acid fumes are indicated.) Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 3—Type B roof consists of four plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt). Two sheets of CAREY-SEAL TARRED FELT are bonded to the deck and together as a base with CAREY-SEAL TAR PITCH, and two additional top sheets of CAREY-SEAL TARRED FELT are bonded both to the surface thus provided, and together, with hot CAREY-SEAL TAR PITCH, and surfaced with Tar Pitch and Slag or Gravel.



Carey 20-year Master Built-up Roofing Specification No. 3
The construction to be followed for application of this specification directly over a Concrete Deck

Type C

Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ to 1½ ins. in 12 ins. (Adapted for use where acid fumes are indicated.) Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 3—Type C roof consists of four plies of CAREY FELT. Two sheets of CAREY FELTEX (Asphalt Saturated Rag Felt) are bonded to the deck and together as a base with Asphalt, and two top sheets of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt) are bonded both to the surface thus provided, and together, with hot CAREY ASPHALT, and surfaced with Asphalt and Slag or Gravel.

Type D

Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ in. in 12 ins. (Adapted for use where acid fumes are indicated.) Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 3—Type D roof consists of four plies of CAREY FELT. Two sheets of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt) are bonded to the deck and together as a base with CAREY-SEAL TAR PITCH, and two top sheets of CAREY ASBESTOS FELT (Tar Impregnated Asbestos Felt) are bonded both to the surface thus provided, and together, with hot CAREY-SEAL TAR PITCH, and surfaced with Tar Pitch and Slag or Gravel.

CAREY MASTER SPECIFICATION NO. 3

General Requirements Applying to All Four Types

Roof Surfacing

The size of Slag or Gravel used for surfacing shall range from ¼ in. to ⅝ in. and be clean, dry and free from dirt. When applied in extreme cold weather same shall be warmed to eliminate frost. Not less than 400 lbs. of Gravel or 300 lbs. of Slag shall be used for covering each 100 sq. ft. of roof surface.

Deck Treatment

Before Built-up Roofing is applied concrete deck must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof deck shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Requirements for Bond

Note: *All types of roofs under Carey Master Built-up Roofing Specification No. 3 are subject to a Carey 20-year Surety Bond when the roof is laid strictly according to Carey Specifications by roofing contractor approved by* THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 50 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 3—Type A

Four plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 175 lbs. CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 3—Type A.

The Feltex used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be mopped with a heavy coat of Asphalt, into which, while hot, two sheets of felt shall be embedded and mopped solid between the sheets with Asphalt, each sheet overlapping the previous sheet 19 ins., leaving 17 ins. exposed. The surface of this two-ply construction shall then be mopped with Asphalt, into which, while hot, two additional sheets of felt shall be applied at right angles to the first two plies, each sheet overlapping the previous sheet 19 ins., leaving 17 ins. exposed. The last two plies shall be bonded together with a solid mopping of Asphalt so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. CAREY ASPHALT used in constructing the roof shall not be heated over 400° F.

Specification No. 3—Type B

Four plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 190 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 3—Type B.

The CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. The roof surface shall first be mopped with a heavy coat of Tar Pitch, into which, while hot, two sheets of felt shall be embedded and mopped solid between the sheets with Tar Pitch, each sheet to overlap the previous sheet 17 ins., leaving 15 ins. exposed. The surface of this two-ply construction shall then be mopped with Tar Pitch, into which, while hot, two additional sheets of felt shall be applied at right angles to the first two plies, each sheet overlapping the previous sheet 17 ins., leaving 15 ins. exposed. The last two plies shall be bonded together with a solid mopping of Tar Pitch so that at no point shall felt touch felt. To the top surface of this construction a flood coat of hot Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. CAREY-SEAL TAR PITCH used in the construction of this roof shall not be heated over 400° F.

Specification No. 3—Type C

Two plies of CAREY FELTEX (Asphalt Saturated Rag Felt) and two plies of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 175 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 3—Type C.

The felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be mopped with a heavy coat of Asphalt into which, while hot, two sheets of Feltex shall be embedded and mopped solid between the sheets with Asphalt, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. The surface of this two-ply construction shall then be mopped with Asphalt, into which, while hot, two sheets of CAREY FIBEROCK shall be applied at right angles to the first two plies of Rag Felt, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. The last two plies shall be bonded together with a solid mopping of Asphalt so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. CAREY ASPHALT used in constructing this roof shall not be heated over 400° F.

Specification No. 3—Type D

Two plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt) and two plies of CAREY ASBESTOS FELT (Tar Impregnated Asbestos Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 190 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 3—Type D.

The CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. wide and the CAREY ASBESTOS FELT shall be 36 ins. wide. The roof surface shall first be mopped with a heavy coat of Tar Pitch, into which, while hot, two sheets of CAREY-SEAL TARRED FELT shall be embedded and mopped solid between the sheets with Tar Pitch, each sheet to overlap the previous sheet 17 ins., leaving 15 ins. exposed. The surface of this two-ply construction shall then be mopped with Pitch, into which, while hot, two sheets of CAREY ASBESTOS FELT shall be applied at right angles to the first two plies, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. The last two plies shall be bonded together with a solid mopping of Tar Pitch so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. CAREY-SEAL TAR PITCH used in constructing this roof shall not be heated over 400° F.

CAREY 10-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 4

Comprising Four Optional Types—3 Ply, Slag or Gravel Surface Over Concrete Decks

GENERAL CHARACTERISTICS

The following general characteristics are common to all four types of roofs covered by Carey Master Built-up Roofing Specification No. 4.

The construction of each type consists of three (3) sheets of CAREY 15-LB. FELT, lapped in such a manner as to provide three-ply construction.

The surface of each roof is covered with a flood coat of hot bitumen poured from a dipper, into which, while hot, *Slag or Gravel* is embedded.

Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ to 1½ ins. in 12 ins. (except where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 4—Type A roof consists of three plies of CAREY FELTEX (Asphalt Saturated Rag Felt). The three plies of felt are bonded to the deck and between the plies with solid moppings of hot CAREY ASPHALT and surfaced with Asphalt and Slag or Gravel.

Type B

Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ in. in 12 ins. (except where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 4—Type B roof consists of three plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt). The three plies of CAREY-SEAL TARRED FELT are bonded to the deck and between the plies with solid moppings of CAREY-SEAL TAR PITCH and surfaced with Tar Pitch and Slag or Gravel.

Type C

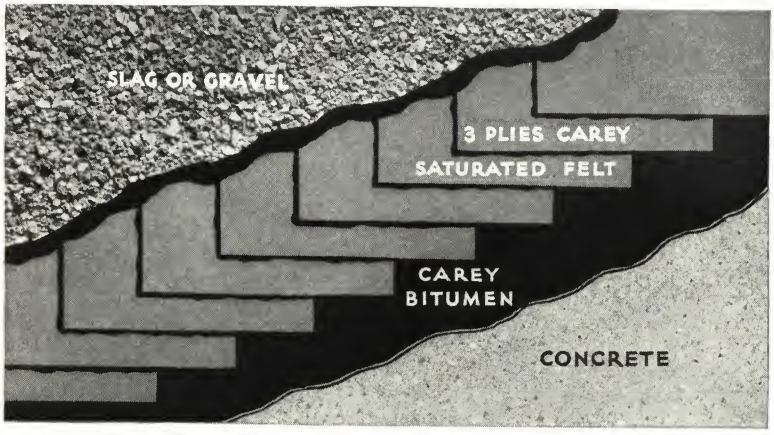
Recommended for use in all sections of the United States for application on decks having an incline ranging from ½ to 1½ ins. in 12 ins. (adapted for use where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 4—Type C roof consists of three plies of CAREY FELT. One sheet of CAREY FELTEX (Asphalt Saturated Rag Felt) is bonded to the deck as a base with hot CAREY ASPHALT and two top sheets of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt) are bonded, both to the surface thus provided, and together, with hot CAREY ASPHALT, and surfaced with Asphalt and Slag or Gravel.

Type D

Recommended for use in all sections of the United States for application on decks having an incline ranging from dead level to ¾ in. in 12 ins. (adapted for use where acid fumes are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 4—Type D roof consists of three plies of CAREY FELT. One sheet of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt) is bonded to the deck as a base with hot CAREY-SEAL TAR PITCH and two top sheets of CAREY ASBESTOS FELT (Tar Impregnated Asbestos Felt) are bonded both to the surface thus provided and together, with hot CAREY-SEAL TAR PITCH, and surfaced with Tar Pitch and Slag or Gravel.



Carey 10-year Master Built-up Roofing Specification No. 4

The construction to be followed for applying Types A and B roof construction directly over concrete deck. Types C and D roof construction are applied in two separate operations; one ply is applied first, after which the two remaining plies are applied shingle fashion over the top of the first ply, as described under "Material and Application Details"

CAREY MASTER SPECIFICATION NO. 4

General Requirements Applying to All Four Types

Roof Surfacing

The size of Slag or Gravel used for surfacing the roof shall range from ¼ in. to ⅝ in. and be clean, dry and free from dirt. When applied in extreme cold weather same shall be warmed to eliminate frost. Not less than 400 lbs. of Gravel or 300 lbs. of Slag shall be used for covering each 100 sq. ft. of roof surface.

Deck Treatment

Before Built-up Roofing is applied concrete deck must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof deck shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Requirements for Bond

Note: All types of roofs under Carey Master Built-up Roofing Specification No. 4 are subject to a Carey 10-Year Surety Bond when the roof is laid strictly according to Carey Specifications by roofing contractor approved by THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 25 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 10-Year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 4—Type A

Three plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 ft., and not less than 140 lbs. CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 4—Type A.

The Feltex used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be mopped with a heavy coat of Asphalt, into which, while hot, shall be applied three sheets of felt mopped solid between the sheets so that at no point shall felt touch felt, each sheet to overlap the previous sheet 25 ins., leaving 11 ins. exposed. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. CAREY ASPHALT used in the construction of the roof shall not be heated over 400° F.

Specification No. 4—Type B

Three plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 175 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 4—Type B.

The CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. wide. The roof surface shall first be mopped with a heavy coat of Tar Pitch, into which, while hot, shall be applied three layers of CAREY-SEAL TARRED FELT mopped solid between the sheets so that at no point shall felt touch felt, each sheet to overlap the previous sheet 22 ins., leaving 10 ins. exposed. To the top surface of this construction a flood coat of CAREY-SEAL TAR PITCH shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. CAREY-SEAL TAR PITCH used in the construction of the roof shall not be heated over 400° F.

Specification No. 4—Type C

On ply of CAREY FELTEX (Asphalt Saturated Rag Felt) and two plies of CAREY FIBEROCK (Asphalt Impregnated Asbestos Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 140 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 4—Type C.

The felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be mopped with a heavy coat of Asphalt, into which, while hot, shall be embedded one layer of CAREY FELTEX, lapping sheets 2 ins. Over the top of the Feltex sheet shall be applied another mopping of CAREY ASPHALT, into which, while hot, shall be embedded two layers of CAREY FIBEROCK, sheets to be lapped 19 ins., leaving 17 ins. exposed—sheets to be mopped solid between the plies with hot Asphalt. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. of Asphalt shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. CAREY ASPHALT used in the construction of the roof shall not be heated over 400° F.

Specification No. 4—Type D

One ply of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), 32 ins. wide, and two plies of CAREY ASBESTOS FELT (Tar Impregnated), 36 ins. wide, each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 175 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 4—Type D.

CAREY ASBESTOS FELT 36 ins. wide and CAREY-SEAL TARRED FELT 32 ins. wide shall be used in constructing this roof. The roof surface shall first be mopped with a heavy coat of Tar Pitch, into which, while hot, shall be applied one layer of CAREY-SEAL TARRED FELT, lapping sheets 2 ins. Over the top of the CAREY-SEAL TARRED FELT shall be applied another mopping of CAREY-SEAL TAR PITCH, into which, while hot, shall be embedded two layers of CAREY ASBESTOS FELT (Tar Impregnated), sheets to be lapped 19 ins., leaving 17 ins. exposed —The last two sheets shall be mopped solid between the plies with hot Tar Pitch. To the top surface of this construction a flood coat of Tar Pitch shall be poured from a dipper and not less than 60 lbs. of Tar Pitch shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. CAREY-SEAL TAR PITCH used in the construction of the roof shall not be heated over 400° F.

CAREY 20-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 5

Comprising Three Optional Types—Asbestos, Rag Felt or Combination Mineral Surfaced Over Wood Decks

GENERAL CHARACTERISTICS

The following general characteristics are common to all three types of roofs covered by Carey Master Built-up Roofing Specification No. 5.

The construction of each type consists of a layer of Red Rosin Sized Sheathing Paper and three (3) sheets CAREY 15-LB. FELT, lapped in such a manner as to provide three-ply construction, over the top of which one layer of CAREY DUR-A-SEAL MINERAL SURFACED CAP SHEET is applied.

Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

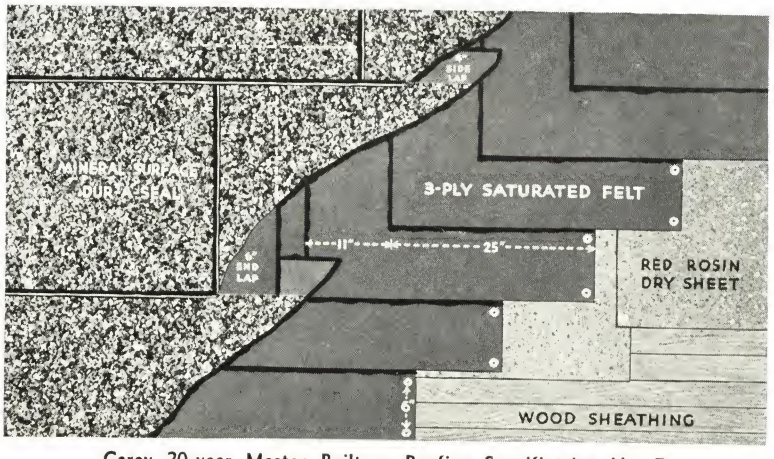
Recommended for use in all sections of the United States for application on decks having an incline of ¼ to 3 ins. in 12 ins. (except where acid conditions are indicated). Subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 5—Type A roof consists of a layer of Red Rosin Sized Sheathing Paper, over which three plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt) are applied and secured to the deck by the back nailing method and mopped solid between the laps with hot CAREY ASPHALT. Over this construction a cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Rag Felt Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps, and bonded to the surface of the three-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.

Type B

Recommended for use in all sections of the United States for application on decks having an incline of ¾ to 3 ins. in 12 ins. (where acid conditions are indicated). Subject to Underwriters' Laboratories Class B Fire Rating.

Specification No. 5—Type B roof consists of a layer of Red Rosin Sized Sheathing Paper, over which three plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt) are applied and secured to the deck by the back nailing method and mopped solid between the laps with hot CAREY ASPHALT. Over this construction a cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps, and bonded to the surface of the three-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.



Carey 20-year Master Built-up Roofing Specification No. 5

The construction to be followed in applying all types of Built-up Roofing covered by Carey Master Built-up Roofing Specification No. 5 for application directly over wood decks

Type C

Recommended for use in all sections of the United States for application on decks having an incline of ¾ to 3 ins. in 12 ins. (especially where acid conditions are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 5—Type C roof consists of a layer of Red Rosin Sized Sheathing Paper, over which three plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt) are applied, coated side down, and secured to the deck by the back nailing method and mopped solid between the laps with hot CAREY ASPHALT. Over this construction a cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps, and bonded to the surface of the three-ply construction and between the laps of the Dur-A-Seal Cap with moppings of hot Asphalt.

CAREY MASTER SPECIFICATION NO. 5
General Requirements Applying to All Three Types

Steep Deck Application

When Carey Master Built-up Roofing Specification No. 5 is applied over roof decks having an incline of 1 in. in 12 ins. or greater, the cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL shall be back-nailed approximately every 6 ins. along the underside of the end lap and approximately every 12 ins. along the underside of the side lap with 1-in. "Simplex" nails. The top or cap sheet in these instances should always be run parallel with the pitch of the roof and the sheet at the peak or ridge should extend over the ridge at least 12 ins. and be secured to the deck along the opposite slope with "Simplex" nails driven along the end of the sheet. Asphalt used in the construction of this roof when applied over decks having a pitch exceeding 1 in. in 12 ins. shall be CAREY STEEP PITCH ASPHALT.

Deck Treatment

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Gypsum Decks—When this specification is applied over gypsum decks the length of the nails called for under "Material and Application Details" shall be 1¾ in. long instead of 1 in. long.

Requirements for Bond

Note: All types of roofs under Carey Master Built-up Roofing Specification No. 5 are subject to a Carey 20-year Surety Bond when the roof is laid strictly according to Carey specifications by roofing contractor approved by THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 50 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 5—Type A

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, three layers of 15 lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Rag Felt Base), weighing approximately 75 lbs. per 100 sq. ft., and 75 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 5—Type A.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 ins. and secured to the deck by occasional nailing. Over this sheet shall then be applied three layers of 15-lb. Feltex, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be mopped solid between the laps with Carey Asphalt and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 in. To the surface of this three-ply construction a solid mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 5—Type B

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, three layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of 75-lb. Mineral Surfaced Dur-A-Seal (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 75 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 5—Type B.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 ins. and secured to the deck by occasional nailing. Over this sheet shall then be applied three layers of 15-lb. Feltex, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be mopped solid between the laps with CAREY ASPHALT and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 ins. To the surface of this three-ply construction a solid mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 5—Type C

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, three layers of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and one sheet of 75-lb. Mineral Surfaced Dur-A-Seal (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 75 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 5—Type C.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 ins. and secured to the deck by occasional nailing. Over this sheet shall then be applied three layers of 20-lb. Fiberock, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be applied with coated side down and mopped solid between the laps with CAREY ASPHALT and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 ins. To the surface of this three-ply construction a solid mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded sheets of Mineral Surfaced Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

CAREY 10-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 6

Comprising Three Optional Types—Asbestos, Rag Felt or Combination Mineral Surfaced Over Wood Decks

GENERAL CHARACTERISTICS

The following general characteristics are common to all three types of roofs covered by Carey Master Built-up Roofing Specification No. 6.

The construction of each type consists of a layer of Red Rosin Sized Sheathing Paper and two (2) sheets of CAREY 15-LB. FELT, lapped in such a manner as to provide two-ply construction, over the top of which one layer of CAREY MINERAL SURFACED DUR-A-SEAL Cap Sheet is applied.

Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

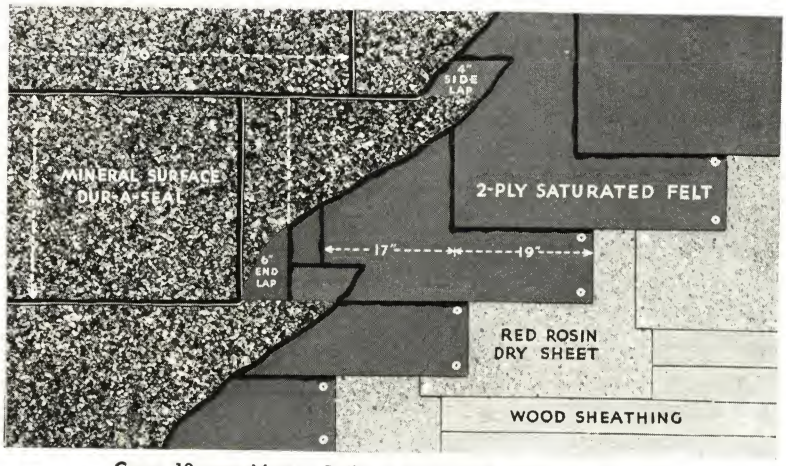
Recommended for use in all sections of the United States for application on decks having an incline of ¾ to 3 ins. in 12 ins. (except where acid conditions are indicated). Subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 6—Type A roof consists of a layer of Red Rosin Sized Sheathing Paper, over which two plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt) are applied and secured to the deck by the back nailing method and mopped solid between the laps with hot CAREY ASPHALT. Over this construction a cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Rag Felt Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the two-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.

Type B

Recommended for use in all sections of the United States for application on decks having an incline of ¾ to 3 ins. in 12 ins. (where acid conditions are indicated). Subject to Underwriters' Laboratories Class B Fire Rating.

Specification No. 6—Type B roof consists of a layer of Red Rosin Sized Sheathing Paper, over which two plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt) are applied and secured to the deck by the back nailing method and mopped solid between the laps with hot CAREY ASPHALT. Over this construction a cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the two-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.



Carey 10-year Master Built-up Roofing Specification No. 6

The construction to be followed in applying all types of Built-up Roofing covered by Carey Master Built-up Roofing Specification No. 6 for application directly over Wood Decks

Type C

Recommended for use in all sections of the United States for application on decks having an incline of ¾ to 3 ins. in 12 ins. (especially where acid conditions are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 6—Type C roof consists of a layer of Red Rosin Sized Sheathing Paper, over which two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt) are applied, coated side down, and secured to the deck by the back nailing method and mopped solid between the laps with hot CAREY ASPHALT. Over this construction a cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the two-ply construction and between the laps of the Dur-A-Seal Cap Sheet with moppings of hot Asphalt.

CAREY MASTER SPECIFICATION NO. 6

General Requirements Applying to All Three Types

Steep Deck Application

When Carey Master Built-up Roofing Specification No. 6 is applied over roof decks having an incline of 1 in. in 12 ins. or greater, the cap or top sheet of CAREY MINERAL SURFACED DUR-A-SEAL shall be back nailed approximately every 6 ins. along the underside of the end lap and approximately every 12 ins. along the underside of the side lap with 1-in. "Simplex" nails. The top or cap sheet in these instances should always be run parallel with the pitch of the roof and the sheet at the peak or ridge should extend over the ridge at least 12 ins. and be secured to the deck along the opposite slope with "Simplex" nails driven along the end of the sheet. Asphalt used in the construction of this roof when applied over decks having a pitch exceeding 1 in. in 12 ins. shall be CAREY STEEP PITCH ASPHALT.

Deck Treatment

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Gypsum Decks—When this specification is applied over gypsum decks the length of the nails called for under "Material and Application Details" shall be 1¾ in. long instead of 1 in. long.

Requirements for Bond

Note: All types of roofs under Carey Master Built-up Roofing Specification No. 6 are subject to a Carey 10-year Surety Bond when the roof is laid strictly according to Carey Specifications by roofing contractor approved by THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 25 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 10-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 6—Type A

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, two layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Rag Felt Base), weighing approximately 75 lbs. per 100 sq. ft., and 50 lbs. of Carey Asphalt shall be used in the construction of Carey Master Built-up Roofing Specification No. 6—Type A.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 in. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 ins. and secured to the deck by occasional nailing. Over this sheet shall then be applied two layers of 15-lb. Feltex, sheets lapped 19 ins., leaving 17 ins. exposed. Sheets shall be mopped solid between the laps with CAREY ASPHALT and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 ins. To the surface of this two-ply construction a mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 6—Type B

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, two layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of 75-lb. Mineral Surfaced Dur-A-Seal (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 50 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 6—Type B.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 in. and secured to the deck by occasional nailing. Over his sheet shall then be applied two layers of 15-lb. Feltex, lapping sheets 19 ins., leaving 17 ins. exposed. Sheets shall be mopped solid between the laps with CAREY ASPHALT and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 ins. To the surface of this two-ply construction a mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 6—Type C

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, two layers of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and one sheet of 75-lb. Mineral Surfaced Dur-A-Seal (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 50 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 6—Type C.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 in. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 ins. and secured to the deck by occasional nailing. Over this sheet shall then be applied two layers of 20-lb. Fiberock, lapping sheets 19 ins., leaving 17 ins. exposed. Sheets shall be applied with coated side down and mopped solid between the laps with CAREY ASPHALT and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 ins. To the surface of this two-ply construction a mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded sheets of Mineral Surfaced Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

CAREY 20-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 7

Comprising Three Optional Types

Asbestos, Rag Felt or Combination—Mineral Surfaced

Over

Concrete Decks

GENERAL CHARACTERISTICS

The following general characteristics are common to all three types of roofs covered by Carey Master Built-up Roofing Specification No. 7.

The construction of each type consists of three (3) sheets of Carey 15 lb. Felt, lapped in such a manner as to provide three-ply construction, over the top of which one layer of Carey Dur-A-Seal Mineral Surfaced Cap Sheet is applied.

Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

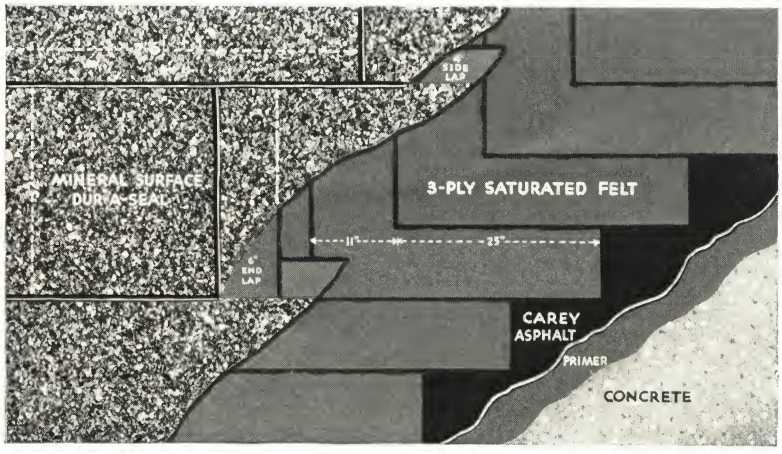
Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ in. in 12 ins. (except where acid conditions are indicated). Subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 7—Type A roof consists of a coat of Asphalt Primer over which three plies of Carey 15-lb. Feltex (Asphalt Saturated Rag Felt) are applied and secured to the deck and between the plies with solid moppings of hot Asphalt. Over this construction a cap or top sheet of Carey Mineral Surfaced Dur-A-Seal (Rag Felt Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the three-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.

Type B

Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ in. in 12 ins. (where moderate acid conditions are indicated). Subject to Underwriters' Laboratories Class B Fire Rating.

Specification No. 7—Type B roof consists of a coat of Asphalt Primer over which three plies of Carey 15-lb. Feltex (Asphalt Saturated Rag Felt) are applied and secured to the deck and between the plies with solid moppings of hot Asphalt. Over this construction a cap or top sheet of Carey Mineral Surfaced Dur-A-Seal (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the three-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.



Carey 20-year Master Built-up Roofing Specification No. 7

The construction to be followed in applying all types of Built-up Roofing covered by Carey Master Built-up Roofing Specification No. 7 for application directly over Concrete Decks

Type C

Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ in. in 12 ins. (especially where acid conditions are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 7—Type C roof consists of a coat of Asphalt Primer over which three plies of Carey 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are applied, coated side down, and secured to the deck and between the plies with a solid mopping of hot Asphalt. Over this construction a cap or top sheet of Carey Mineral Surfaced Dur-A-Seal (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the three-ply construction and between the laps of the Dur-A-Seal Cap Sheet with moppings of hot Asphalt.

CAREY MASTER SPECIFICATION NO. 7

General Requirements Applying to All Three Types

Deck Treatment

Before Built-up Roofing is applied concrete deck must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof deck shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Requirements for Bond

Note: *All types of roofs under Carey Master Built-up Roofing Specification No. 7 are subject to a Carey 20-year Surety Bond when the roof is laid strictly according to Carey specifications by roofing contractor approved by* THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 50 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 7—Type A

One gallon of Asphalt Primer, three layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Rag Felt Base), weighing approximately 75 lbs. per 100 sq. ft., and 115 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 7—Type A.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of Asphalt into which, while hot, shall be embedded three layers of 15-lb. Feltex, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be mopped solid between the plies with CAREY ASPHALT. The surface of this three-ply construction shall then be mopped with a solid mopping of CAREY ASPHALT into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

Specification No. 7—Type B

One gallon of Asphalt Primer, three layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 115 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 7—Type B.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of Asphalt into which, while hot, shall be embedded three layers of 15-lb. Feltex, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be mopped solid between the plies with CAREY ASPHALT. The surface of this three-ply construction shall then be mopped with a solid mopping of CAREY ASPHALT into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

Specification No. 7—Type C

One gallon of Asphalt Primer, three layers of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 115 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 7—Type C.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of asphalt into which, while hot, shall be embedded three layers of 20-lb. Fiberock, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be applied with coated side down and mopped solid between the plies with CAREY ASPHALT. The surface of this three-ply construction shall then be mopped with a solid mopping of CAREY ASPHALT into which, while hot, shall be embedded the sheet of Mineral Surface Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

CAREY 10-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 8

Comprising Three Optional Types

Asbestos, Rag Felt or Combination—Mineral Surfaced

Over

Concrete Decks

GENERAL CHARACTERISTICS

The following general characteristics are common to all three types of roofs covered by Carey Master Built-up Roofing Specification No. 8.

The construction of each type consists of two (2) sheets of Carey 15-lb. Felt, lapped in such a manner as to provide two-ply construction, over the top of which one layer of Carey Dur-A-Seal Mineral Surfaced Cap Sheet is applied.

Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

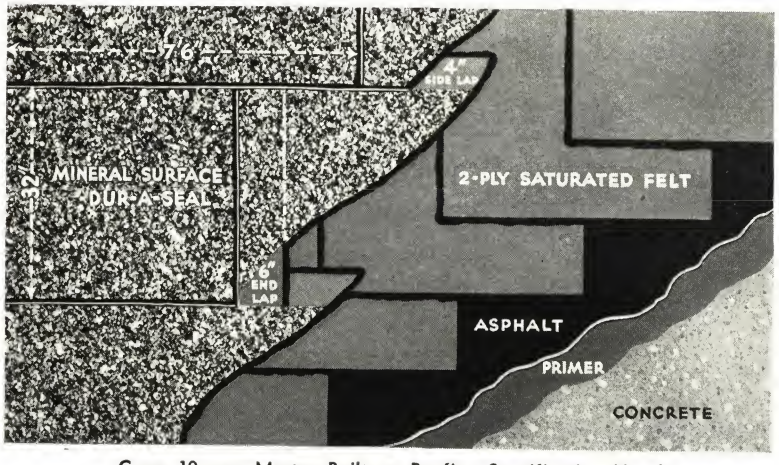
Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ in. in 12 ins. (except where acid conditions are indicated). Subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 8—Type A roof consists of a coat of Asphalt Primer over which two plies of Carey 15-lb. Feltex (Asphalt Saturated Rag Felt) are applied and secured to the deck and between the plies with solid moppings of hot Asphalt. Over this construction a cap or top sheet of Carey Mineral Surfaced Dur-A-Seal (Rag Felt Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the two-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.

Type B

Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ in. in 12 ins. (where moderate acid conditions are indicated). Subject to Underwriters' Laboratories Class B Fire Rating.

Specification No. 8—Type B roof consists of a coat of Asphalt Primer over which two plies of Carey 15-lb. Feltex (Asphalt Saturated Rag Felt) are applied and secured to the deck and between the plies with solid moppings of hot Asphalt. Over this construction a cap or top sheet of Carey Mineral Surfaced Dur-A-Seal (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the two-ply construction and between the laps of Dur-A-Seal Cap Sheet with moppings of hot Asphalt.



Carey 10-year Master Built-up Roofing Specification No. 8

The construction to be followed in applying all types of Built-up Roofing covered by Carey Master Built-up Roofing Specification No. 8 for application directly over Concrete Decks

Type C

Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ in. in 12 ins. (especially where acid conditions are indicated). Subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 8—Type C roof consists of a coat of Asphalt Primer over which two plies of Carey 20-lb. Firerock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are applied, coated side down, and secured to the deck and between the plies with a solid mopping of hot Asphalt. Over this construction a cap or top sheet of Carey Mineral Surfaced Dur-A-Seal (Asbestos Base) is applied in sections approximately 8 ft. long and lapped 6 ins. at the end laps and 4 ins. at the side laps and bonded to the surface of the two-ply construction and between the laps of the Dur-A-Seal Cap Sheet with moppings of hot Asphalt.

CAREY MASTER SPECIFICATION NO. 8

General Requirements Applying to All Three Types

Deck Treatment

Before Built-up Roofing is applied concrete must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof deck shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Requirements for Bond

Note: *All types of roofs under Carey Master Built-up Roofing Specification No. 8 are subject to 10-year Surety Bond when the roof is laid strictly according to Carey specifications by roofing contractor approved by* THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 25 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 10-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 8—Type A

One gallon of Asphalt Primer, two layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Rag Felt Base), weighing approximately 75 lbs. per 100 sq. ft., and 90 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 8—Type A.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of Asphalt into which, while hot, shall be embedded two layers of 15-lb. Feltex, lapping sheets 19 ins., leaving 17 ins. exposed. Sheets shall be mopped solid between the plies with CAREY ASPHALT. The surface of this two-ply construction shall then be mopped with a solid mopping of CAREY ASPHALT into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

Specification No. 8—Type B

One gallon of Asphalt Primer, two layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 90 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 8—Type B.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of Asphalt into which, while hot, shall be embedded two layers of 15-lb. Feltex, lapping sheets 19 ins., leaving 11 ins. exposed. Sheets shall be mopped solid between the plies with CAREY ASPHALT. The surface of this two-ply construction shall then be mopped with a solid mopping of CAREY ASPHALT into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

Specification No. 8—Type C

One gallon of Asphalt Primer, two layers of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and one sheet of CAREY MINERAL SURFACED DUR-A-SEAL (Asbestos Base), weighing approximately 75 lbs. per 100 sq. ft., and 90 lbs. of CAREY ASPHALT shall be used in the construction of Carey Master Built-up Roofing Specification No. 8—Type C.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of Asphalt into which, while hot, shall be embedded two layers of 20-lb. Fiberock, lapping sheets 19 ins., leaving 17 ins. exposed. Sheets shall be applied with coated side down and mopped solid between the plies with CAREY ASPHALT. The surface of this two-ply construction shall then be mopped with a solid mopping of CAREY ASPHALT into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Asbestos Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

CAREY 20-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 9

Comprising Two Optional Types—Asbestos or Rag Felt—Asphalt Surface Over Wood or Gypsum Decks

GENERAL CHARACTERISTICS

The following characteristics are common to both types of roofs covered by Carey Master Built-up Roofing Specification No. 9.

The construction of each type consists of a heavy 60-lb. Asphalt Saturated or Impregnated and Coated Base Sheet and three sheets of CAREY FELT.

The surface of each roof is covered with a uniform coating of hot Asphalt.

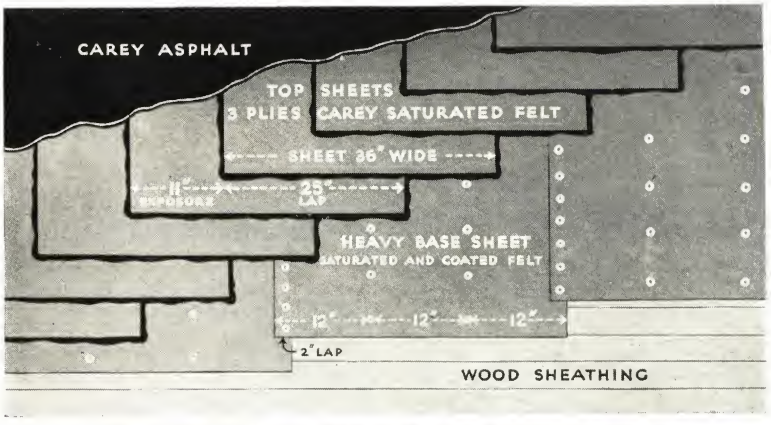
Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 2 ins. in 12 ins. (Especially recommended where acid fumes are indicated.) Roof is subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 9—Type A roof consists of an extra heavy Fiberock Asbestos Base Sheet (Asphalt Impregnated and Coated Asbestos Felt) which is lapped 2 ins., and secured to the roof deck with nails. To this base sheet three plies of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.



Carey 20-year Master Built-up Roofing Specification No. 9

The construction to be followed in applying both types of Built-up Roofs covered by Carey 20-year Master Built-up Roofing Specification No. 9 for application over wood or gypsum decks

Type B

Recommended for use in northern and eastern sections of the United States for application on decks having an incline ranging from ¾ to 2 ins. in 12 ins. (except where acid fumes are indicated).

Roof is subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 9—Type B roof consists of an extra heavy Feltex Base Sheet (Asphalt Saturated and Coated Rag Felt) which is lapped 2 ins. and secured to the deck with nails. To this base sheet three plies of 15-lb. Asphalt Saturated Rag Felt are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.

CAREY MASTER SPECIFICATION NO. 9

General Requirements Applying to Types A and B

Deck Treatment

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris, and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Gypsum Decks—When this specification is applied over Gypsum Decks, nails called for under "Material and Application Details," shall be 1¾ ins. long instead of 1 in. long.

Requirements for Bond

Note: All types of roofs under Carey Master Built-up Roofing Specification No. 9 are subject to a Carey 20-year Surety Bond when the roof is laid strictly according to Carey specifications by roofing contractor approved by THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 50 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 9—Type A

One layer of CAREY FIBEROCK ASBESTOS BASE SHEET (Asphalt Impregnated and Coated Asbestos Felt) weighing approximately 60 lbs. per 100 sq. ft., and three plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt) each sheet weighing approximately 20 lbs. per 100 sq. ft., and 100 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-Up Roofing Specification No. 9—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 60-lb. Fiberock Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded three sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap previous sheet 25 ins., leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 9—Type B

One layer of CAREY FELTEX BASE SHEET (Asphalt Saturated and Coated Rag Felt) weighing approximately 60 lbs. per 100 sq. ft., and three plies of 15-lb. Feltex (Asphalt Saturated Rag Felt) each sheet weighing approximately 15 lbs. per 100 sq. ft., and 100 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-Up Roofing Specification No. 9—Type B.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 60-lb. Feltex Base Sheets, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded three sheets of 15-lb. Feltex, each sheet to overlap the previous sheet 25 ins., leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

CAREY 10-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 10

Comprising Three Optional Types

Asbestos, Rag Felt or Combination—Asphalt Surface

Over

Wood or Gypsum Decks

GENERAL CHARACTERISTICS

The following characteristics are common to all three types of roofs covered by Carey Master Built-up Roofing Specification No. 10.

The construction of each type consists of a heavy Asphalt Saturated or Impregnated and Coated Base Sheet and two sheets of CAREY FELT.

The surface of each roof is covered with a uniform coating of hot Asphalt.

Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

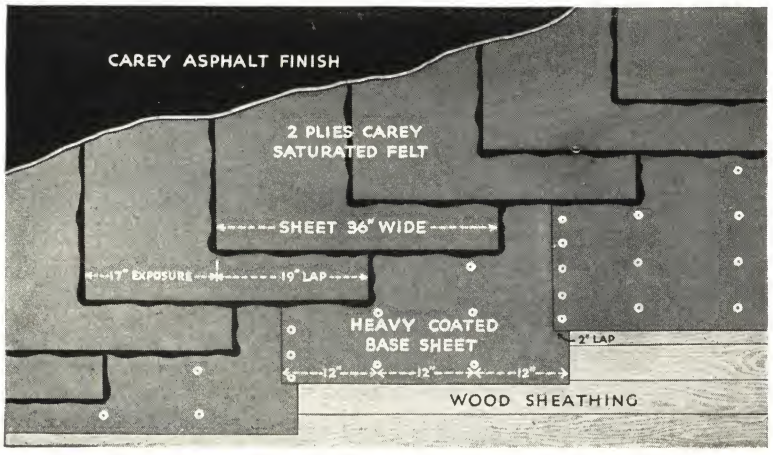
Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 2 ins. in 12 ins. (Especially recommended where acid fumes are indicated.) Roof is subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 10—Type A roof consists of a heavy Fiberock Asbestos Base Sheet (Asphalt Impregnated and Coated Asbestos Felt) which is lapped 2 ins. and secured to the roof deck with nails. To this base sheet two plies of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.

Type B

Recommended for use in northern and eastern sections of the United States for application on decks having an incline ranging from ¾ to 2 ins. in 12 ins. (except where acid fumes are indicated). Roof is subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 10—Type B roof consists of a heavy Feltex Base Sheet (Asphalt Saturated and Coated Rag Felt) which is lapped 2 ins. and secured to the deck with nails. To this base sheet two plies of 15-lb. Asphalt Saturated Rag Felt are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.



Carey 10-year Master Built-up Roofing Specification No. 10

The construction to be followed in applying all three types of Built-up Roofs covered by Carey 10-year Master Built-up Roofing Specification No. 10 for application over wood or gypsum decks

Type C

Recommended for use in northern and eastern sections of the United States for application on decks having an incline ranging from ¾ to 2 ins. in 12 ins. (where moderate acid fumes are indicated). Roof is subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 10—Type C roof consists of a heavy Feltex Base Sheet (Asphalt Saturated and Coated Rag Felt) which is lapped 2 ins. and secured to the deck with nails. To this base sheet two plies of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.

CAREY MASTER SPECIFICATION NO. 10

General Requirements Applying to All Three Types

Deck Treatment

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Gypsum Decks—When this specification is applied over gypsum decks the length of the nails called for under "Material and Application Details" shall be 1¾ ins. long instead of 1 in. long.

Requirements for Bond

Note: *All types of roofs under Carey Master Built-up Roofing Specification No. 10 are subject to a Carey 10-year Surety Bond when the roof is laid strictly according to Carey Specifications by roofing contractor approved by* THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 25 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 10-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 10—Type A

One layer of CAREY 45-LB. FIBEROCK ASBESTOS BASE SHEET (Asphalt Impregnated and Coated Asbestos Felt), weighing approximately 45 lbs. per 108 sq. ft., and two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 75 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 10—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 45-lb. Fiberock Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded two sheets of CAREY 20-LB. FIBEROCK, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 10—Type B

One layer of CAREY 30-LB. FELTEX BASE SHEET (Asphalt Saturated and Coated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and 75 lbs. CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 10—Type B.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 30-lb. Feltex Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of 15-lb. Feltex, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 10—Type C

One layer of CAREY 30-LB. FELTEX BASE SHEET (Asphalt Saturated and Coated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated one side with Asphalt), each sheet weighing approximately 20 lbs. per sq. ft., and 75 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 10—Type C.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 30-lb. Feltex Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailed approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded two sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

CAREY 20-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 11

Comprising Two Optional Types—Asbestos or Rag Felt—Asphalt Surface Over Concrete Decks

GENERAL CHARACTERISTICS

The following characteristics are common to both types of roofs covered by Carey Master Built-up Roofing Specification No. 11.

The construction of each type consists of one gallon of Asphalt Primer, a heavy 60-lb. Asphalt Saturated or Impregnated and Coated Base Sheet and three sheets of CAREY FELT.

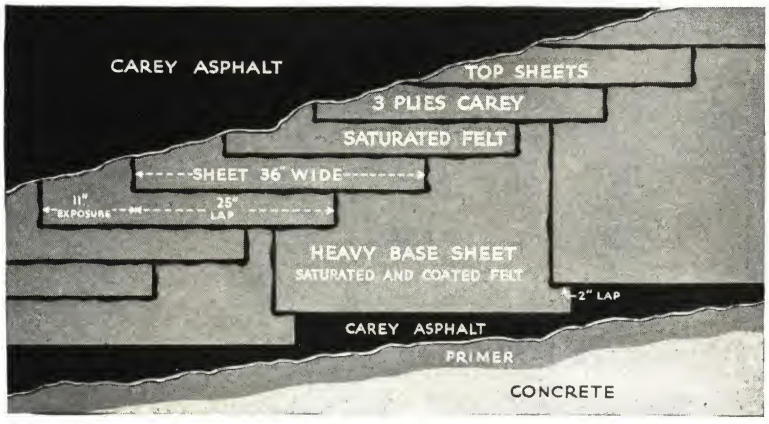
The surface of each roof is covered with a uniform coating of hot Asphalt. Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ ins. in 12 ins. (Especially recommended where acid fumes are indicated.) Roof is subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 11—Type A roof consists of a coat of Asphalt Primer, an extra heavy Fiberock Asbestos Base Sheet (Asphalt Impregnated and Coated Asbestos Felt) which is lapped 2 ins. and bonded to the roof deck with hot Asphalt. To this base sheet three plies of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.



Carey 20-year Master Built-up Roofing Specification No. 11

The construction to be followed in applying both types of Built-up Roofs covered by Carey 20-year Master Built-up Roofing Specification No. 11 for application over concrete decks

Type B

Recommended for use in northern and eastern sections of the United States for application on decks having an incline ranging from ¾ to 1½ ins. in 12 ins. (except where acid fumes are indicated).

Roof is subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 11—Type B roof consists of a coat of Asphalt Primer, an extra heavy Feltex Base Sheet (Asphalt Saturated and Coated Rag Felt) which is lapped 2 ins. and bonded to the deck with hot Asphalt. To this base sheet three plies of 15-lb. Asphalt Saturated Rag Felt are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.

CAREY MASTER SPECIFICATION NO. 11

General Requirements Applying to Types A and B

Deck Treatment

Before Built-up Roofing is applied concrete deck must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof deck shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Requirements for Bond

Note: All types of roofs under Carey Master Built-up Roofing Specifications No. 11 are subject to a Carey 20-year Surety Bond when the roof is laid strictly according to Carey specifications by roofing contractor approved by THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 50 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 11—Type A

One gallon Asphalt Primer, a base sheet of CAREY FIBEROCK (Asphalt Impregnated and Coated Asbestos Felt), weighing approximately 60 lbs. per 100 sq. ft., three plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 135 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 11—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be laid the CAREY 60-LB. FIBEROCK BASE SHEET, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded three sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 25 ins., leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 11—Type B

One gallon Asphalt Primer, a base sheet of CAREY FELTEX (Asphalt Saturated and Coated Rag Felt), weighing approximately 60 lbs. per 100 sq. ft. and three plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and 135 lbs. CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 11—Type B.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be laid the CAREY 60-LB. FELTEX Base Sheet, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded three sheets of felt, each sheet to overlap the previous sheet 25 ins., leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of CAREY ASPHALT. CAREY ASPHALT used in constructing this roof shall not be heated over 400° F.

CAREY 10-YEAR MASTER BUILT-UP ROOFING SPECIFICATION NO. 12

Comprising Three Optional Types

Asbestos, Rag Felt or Combination—Asphalt Surface

Over

Concrete Decks

GENERAL CHARACTERISTICS

The following characteristics are common to all three types of roofs covered by Carey Master Built-up Roofing Specification No. 12.

The construction of each type consists of one gallon of Asphalt Primer, a heavy Asphalt Saturated or Impregnated and Coated Base Sheet and two sheets of CAREY FELT.

The surface of each roof is covered with a uniform coating of hot Asphalt. Character of felts, bitumen and methods of application are indicated under "Material and Application Details" for the type of roof selected.

BRIEF DESCRIPTION OF OPTIONAL TYPES AND SERVICE ADAPTABILITY

Type A

Recommended for use in all sections of the United States for application on decks having an incline ranging from ¾ to 1½ ins. in 12 ins. (Especially recommended where acid fumes are indicated.) Roof is subject to Underwriters' Laboratories Class A Fire Rating.

Specification No. 12—Type A roof consists of a coat of Asphalt Primer, a heavy Fiberock Asbestos Base Sheet (Asphalt Impregnated and Coated Asbestos Felt) which is lapped 2 ins. and bonded to the roof deck with hot Asphalt. To this base sheet two plies of 20-lb Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.

Type B

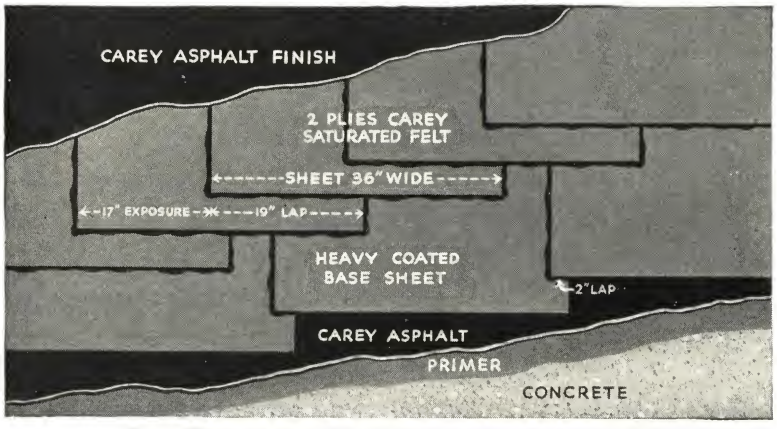
Recommended for use in northern and eastern sections of the United States for application on decks having an incline ranging from ¾ to 1½ ins. in 12 ins. (except where acid fumes are indicated). Roof is subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 12—Type B roof consists of a coat of Asphalt Primer, a heavy Feltex Base Sheet (Asphalt Saturated and Coated Rag Felt) which is lapped 2 ins. and bonded to the deck with hot Asphalt. To this base sheet two plies of 15-lb. Asphalt Saturated Rag Felt are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.

Type C

Recommended for use in northern and eastern sections of the United States for application on decks having an incline ranging from ¾ to 1½ ins. in 12 ins. (where moderate acid fumes are indicated). Roof is subject to Underwriters' Laboratories Class C Fire Rating.

Specification No. 12—Type C roof consists of a coat of Asphalt Primer, a heavy Feltex Base Sheet (Asphalt Saturated and Coated Rag Felt) which is lapped 2 ins. and bonded to the deck with hot Asphalt. To this base sheet two plies of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt) are bonded and sealed together with solid moppings of CAREY ASPHALT. Roof surface consists of a uniform coating of CAREY ASPHALT.



Carey 10-year Master Built-up Roofing Specification No. 12

The construction to be followed in applying all three types of Built-up Roofs covered by Carey 10-year Master Built-up Roofing Specification No. 12 for application over concrete decks

CAREY MASTER SPECIFICATION NO. 12

General Requirements Applying to All Three Types

Deck Treatment

Before Built-up Roofing is applied concrete deck must be thoroughly dry, with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof deck shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Requirements for Bond

Note: *All types of roofs under Carey Master Built-up Roofing Specification No. 12 are subject to a Carey 10-year Surety Bond when the roof is laid strictly according to Carey specifications by roofing contractor approved by* THE PHILIP CAREY COMPANY. *Bonds will be furnished on jobs of 25 squares or over where Carey roof inspection service is available.*

Bond Clause—The roofing contractor shall furnish THE PHILIP CAREY COMPANY'S 10-year Surety Bond covering both material and workmanship used in the construction of this roof.

Material and Application Details

Specification No. 12—Type A

One gallon Asphalt Primer, a base sheet of CAREY 45-LB. FIBEROCK (Asphalt Impregnated and Coated Asbestos Felt), weighing approximately 45 lbs. per 108 sq. ft., two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft. and 115 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 12—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be laid the CAREY 45-LB. FIBEROCK Base Sheet, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

Specification No. 12—Type B

One gallon Asphalt Primer, a base sheet of CAREY FELTEX (Asphalt Saturated and Coated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and 115 lbs. CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 12—Type B.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be laid the CAREY 30-LB. FELTEX Base Sheet, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of felt, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of CAREY ASPHALT. CAREY ASPHALT used in constructing this roof shall not be heated over 400° F.

Specification No. 12—Type C

One gallon of Asphalt Primer, a base sheet of CAREY FELTEX (Asphalt Saturated and Coated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 115 lbs. of CAREY ASPHALT shall be used in the construction of 100 sq. ft. of Carey Master Built-up Roofing Specification No. 12—Type C.

All felts used in the construction of the roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer, to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be embedded the CAREY 30-LB. FELTEX Base Sheet, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

CAREY SPECIFICATIONS FOR APPLICATION OF ROOF INSULATION

Over

Wood, Concrete and Steel Decks

The following Carey Master Built-up Roofing Specifications are especially adapted for application over insulated wood, concrete and steel decks (asphalt primer called for in roofing specifications to be omitted unless called for in the insulation specification):

(1) 20-year Slag or Gravel surfaced: All types called for under Carey Master Built-up Roofing Specification No. 3.

(2) 10-year Slag or Gravel surfaced: All types called for under Carey Master Built-up Roofing Specification No. 4.

(3) 20-year Dur-A-Seal Mineral Surfaced: All types called for under Carey Master Built-up Roofing Specification No. 7.

(4) 10-year Dur-A-Seal Mineral Surfaced: All types called for under Carey Master Built-up Roofing Specification No. 8.

(5) 20-year smooth Asphalt finished: All types called for under Carey Master Built-up Roofing Specification No. 11.

(6) 10-year smooth Asphalt finished: All types called for under Carey Master Built-up Roofing Specification No. 12.

GENERAL REQUIREMENTS

When smooth top Asphalt finished roofs, Dur-A-Seal Mineral surfaced roofs or any other type roof not surfaced with Slag or Gravel, is specified for application over insulated poured or pre-cast concrete decks, the deck shall be primed with a coat of cold Asphalt Primer, using approximately one gallon per 100 sq. ft., before the first mopping of Asphalt, which is to bond the insulation in place, is applied.

Bitumen required for application of roof insulation shall be in addition to the total quantity specified for use in applying the built-up roofing specification.

The roof deck shall be acceptable to the roofing contractor and shall be thoroughly clean, dry and otherwise conform to the accepted standard of deck construction providing a suitable surface over which to apply a built-up roof.

At the end of each day's work the exposed edges of the insulation shall be protected from the elements with a strip of 15-lb. Saturated Felt bonded to the deck and extended over exposed edges of insulation with a mopping of hot Bitumen.

The application of the built-up roof shall follow closely the application of the insulation and at no time shall the built-up roof be applied when the surface of the insulation is moist or damp.

SPECIAL CONSTRUCTION RECOMMENDATIONS

The constructions recommended in this note, while not a part of this insulation specification, are suggested for use on jobs where improved construction is desired at small additional cost.

(a) Concrete Decks—A mopping of hot Bitumen and a layer of 15-lb. Saturated Felt applied to the deck before insulation is applied provides a better base and a dryer bonding surface for the insulation than otherwise would be provided if insulation was applied directly over the concrete.

(b) Water Stops—When insulation is applied to all types of decks it may be divided into sections by means of water stops or seal courses consisting of strips of 15-lb. Saturated Felt approximately 10½ ins. wide. One half the width of a Saturated Felt strip is bonded to the deck with hot Bitumen, the other half is extended over the edges and on to the surface of the insulation and secured to same with a mopping of hot Bitumen.

These water stops or seal courses should be placed at intervals of approximately 30 feet in both directions and at all outside edges of insulation, thereby preventing the danger of water from possible leaks traveling from one section of the insulation to another.

Specification for Insulated Wood Decks

The wood deck shall first be covered with two layers of Red Rosin Sized Sheathing Paper weighing approximately 5 lbs. per 100 sq. ft. Sheets shall be lapped approximately 19 ins. at the side and end laps and secured to the deck by occasional nailing. Over this surface a layer of approved insulation shall be applied strictly according to architect's or manufacturer's specifications and secured to the deck with large headed roofing nails. (If additional layers of roof insulation are specified, joints between each subsequent layer shall be broken and layers of insulation shall be bonded together and firmly embedded into a solid mopping of hot Bitumen.) Over the surface of the applied insulation the built-up roof, type as specified, shall be applied.

All Bitumen used in applying insulation shall be of the same type as is used in the construction of the built-up roof.

Specification for Insulated Concrete Decks

The concrete deck shall first be covered with a solid mopping of hot Bitumen. (When Asphalt roofs are specified which are not to be surfaced with Slag or Gravel the deck shall be primed before the mopping of hot Asphalt is applied.) Into the solid mopping of Bitumen, while hot, shall be firmly embedded a layer of approved roof insulation applied strictly according to architect's or manufacturer's specifications. (If additional layers of roof insulation are specified, joints between each subsequent layer shall be broken and layers of insulation shall be bonded together and firmly embedded into a solid mopping of hot Bitumen.) Over the surface of the applied insulation the built-up roof, type as specified, shall be applied.

All Bitumen used in applying insulation shall be of the same type as is used in the construction of the built-up roof.

Specification for Insulated Steel Decks

Sections of the steel deck formed in sheets shall provide rigidity and strength and not be subject to excessive deflection. Steel deck shall be free from perforations which will allow hot Bitumen to drip through the deck and shall be free from bolt heads, purlin clips and insulation cleats and other objectionable projections. Deck and fixtures shall have a shop coat of paint. Roofing specifications constructed of Coal Tar Pitch are not recommended for application over steel deck construction.

The steel deck shall first be covered with a solid mopping of Asphalt into which, while hot, shall be firmly embedded a layer of approved roof insulation applied strictly according to architect's or manufacturer's specifications. On roof decks having an incline exceeding ¾ in. in 12 ins. insulation shall be secured in place with metal clips or bolts in addition to the bond provided by the Asphalt. (If additional layers of roof insulation are specified, joints between each subsequent layer shall be broken and layers of insulation shall be bonded together and firmly embedded into a solid mopping of hot Asphalt.)

All Asphalt used in the application of insulation for bonding roofing to the surface of the insulation, when applied over steel deck, shall have a minimum melting point of 190° F. Over the surface of the applied insulation the built-up roof, type as specified, shall be applied.

CAREY BONDED FLASHING DETAILS

CAREY BONDED FLASHINGS to be used in conjunction with either Asphalt or Tar constructed roofs, subject to 10, 15 or 20-year Flashing endorsements, shall consist of a composition base Flashing and a metal cap or counter-flashing which is secured into the parapet wall by means of the metal Schneider Counter-flashing Receiver.

General Requirements

The Schneider Counter-flashing Receiver shall be built into the mortar joint of the parapet wall 10 to 12 ins. above the grade line of the roof deck by the brick mason or the general contractor.

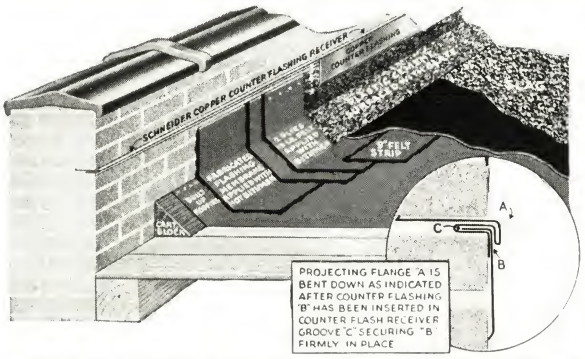
The general contractor shall furnish and install in all angles between the roof deck and the parapet wall a suitable cant strip in order to cove the angle to a height of approximately 4 ins.

Carey Flashing Detail 5-A

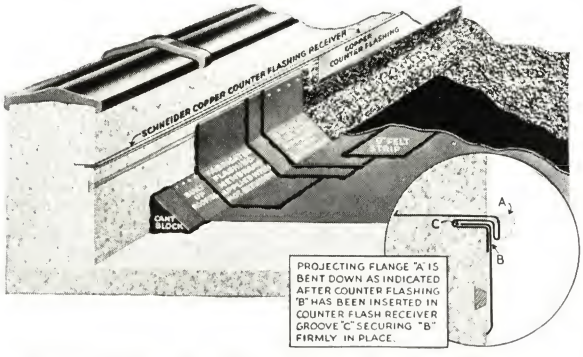
Subject to 20-year Flashing endorsement. For use in conjunction with CAREY ROOFS constructed of Asphalt.

The Schneider Counter-flashing shall be fabricated out of copper and be installed in the parapet wall by the brick mason or the general contractor. The general contractor shall also furnish and install a suitable cant strip in the angle formed by the roof deck and the parapet wall at all points where Flashing is to be installed. The roofing contractor shall prime all parapet wall areas to be flashed with Asphalt Primer and shall extend all plies of the roof construction to the top of the cant strip and secure same along the upper edge of cant strip with large headed roofing nails.

The base flashing shall consist of a layer of CAREY FABRICATED FLASHING MEMBRANE, approximately 18 ins. wide, and two layers of CAREY 15-LB. FELTEX or 20-LB. FIBEROCK, approximately 20 ins. wide. The first sheet shall extend out on to the horizontal plane of the roof surface, approximately 6 ins., and the two top sheets approximately 8 ins. and all three sheets shall extend up the vertical wall to a point approximately 1 in. below the Counter-flashing Receiver. All sheets shall be bonded in place and together with solid moppings of hot Asphalt and be secured into the mortar joint or nailing strip along top edge of base flashing with "Simplex" nails. The exposed surface of the base flashing shall then be covered with a uniform coat of CAREY FLASHING PLASTIC applied cold, into the surface of which shall be embedded coarse, clean, dry sand or crushed slate. The edges of the felt which extend over the roof surface shall then be stripped with a 9-in. wide strip of 15-lb. Feltex and bonded in place with a mopping of hot Asphalt, after which a 4-in. copper cap or Counter-flashing shall be inserted into the Schneider Counter-flashing Receiver and the projecting flange of the receiver shall be bent down over the Counter-flashing.



Method of Installing Carey Bonded Flashing on Brick Parapet Wall



Method of Installing Carey Bonded Flashing on Concrete Parapet Wall

Carey Flashing Detail 6-A

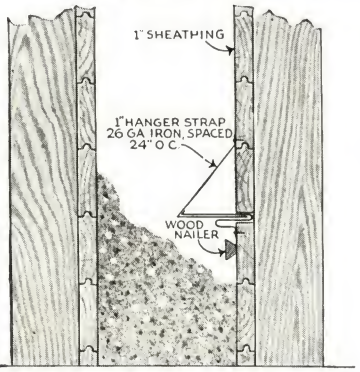
Subject to 10-year Flashing endorsement. For use in conjunction with CAREY ROOFS constructed of Asphalt.

The Schneider Counter-flashing shall be fabricated out of Armco Galvanized Iron and be installed in the parapet wall by the brick mason or the general contractor. The general contractor shall also furnish and install a suitable cant strip in the angle formed by the roof deck and the parapet wall at all points where the Flashing is to be installed.

The roofing contractor shall prime all parapet wall areas to be flashed with Asphalt Primer and shall extend all plies of the roof construction to the top of the cant strip and secure same along the upper edge of cant strip with large headed roofing nails.

The base flashing shall consist of a layer of CAREY FABRICATED FLASHING MEMBRANE, approximately 18 ins. wide and one layer of CAREY 15-LB. FELTEX or 20-LB. FIBEROCK, approximately 20 ins. wide. The first sheet shall extend out on to the horizontal plane of the roof surface, approximately 6 ins., and the top sheet approximately 8 ins. and both sheets shall extend up the vertical wall to a point approximately 1 in. below the Counter-flashing Receiver. Both sheets shall be bonded in place and together with solid moppings of hot Asphalt and be secured into the mortar joint or nailing strip along top edge of base flashing with "Simplex" nails.

The exposed surface of the base flashing shall then be covered with a uniform coat of CAREY ASPHALT. The edges of the felt which extend over the roof surface shall then be stripped with a 9-in. wide strip of 15-lb. Feltex and bonded in place with a mopping of hot Asphalt, after which a 4-in. Armco Galvanized Iron cap or Counter-flashing shall be inserted into the Schneider Counter-flashing Receiver and the projecting flange of the receiver shall be bent down over the Counter-flashing.



Method of Installing Schneider Counter-Flashing Receiver in Concrete Wall

Carey Flashing Detail 7-T

Subject to 20-year Flashing endorsement. For use in conjunction with CAREY ROOFS constructed of Tar Pitch.

The Schneider Counter-flashing shall be fabricated out of copper and be installed in the parapet wall by the brick mason or the general contractor. The general contractor shall also furnish and install a suitable cant strip in the angle formed by the roof deck and the parapet wall at all points where flashing is to be installed. The roofing contractor shall extend all plies of the roof construction to the top of the cant strip and secure same along the upper edge of cant strip with large headed roofing nails.

The base flashing shall consist of four layers of 15-lb. CAREY-SEAL TARRED FELT, two sheets approximately 18 ins. wide and two sheets approximately 20 ins. wide. The first two sheets shall extend out on to the horizontal plane of the roof surface approximately 6 ins. and the two top sheets approximately 8 ins. and all sheets shall extend up to the vertical wall to a point approximately 1 in. below the Counter-flashing Receiver. The first two sheets shall be bonded to the wall and together with solid moppings of hot Tar Pitch and the two top sheets shall be bonded to the first two sheets and together with CAREY FLASHING PLASTIC (Tar Base) applied cold and all sheets secured in the mortar joint or nailing strip along top edge of base flashing with "Simplex" nails. The exposed surface of the base flashing shall then be covered with a uniform coat of CAREY FLASHING PLASTIC (Tar Base) applied cold, into the surface of which shall be embedded coarse, clean, dry sand or crushed slate. The edges of the felt which extend over the roof surface shall then be stripped with a 9-in. wide strip of 15-lb. CAREY-SEAL TARRED FELT and bonded in place with a mopping of hot Tar Pitch, after which a 4-in. copper cap or Counter-flashing shall be inserted into the Schneider Counter-flashing Receiver and the projecting flange of the receiver shall be bent down over the Counter-flashing.

Carey Flashing Detail 8-T

Subject to 10-year Flashing endorsement. For use in conjunction with CAREY ROOFS constructed of Tar Pitch.

The Schneider Counter-flashing shall be fabricated out of Armco Galvanized Iron and be installed in the parapet wall by the brick mason or the general contractor. The general contractor shall also furnish and install a suitable cant strip in the angle formed by the roof deck and the parapet wall at all points where Flashing is to be installed. The roofing contractor shall extend all plies of the roof construction to the top of the cant strip and secure same along the upper edge of cant strip with large headed roofing nails.

The base flashing shall consist of three layers of 15-lb. CAREY-SEAL TARRED FELT, two sheets approximately 18 ins. wide and one sheet approximately 20 ins. wide. The first two sheets shall extend out on to the horizontal plane of the roof surface approximately 6 ins. and the top sheet approximately 8 ins. and all sheets shall extend up the vertical wall to a point approximately 1 in. below the Counter-flashing Receiver. The first two sheets shall be bonded to the wall and together with solid moppings of hot Tar Pitch and the top sheet shall be bonded to the first two sheets with CAREY FLASHING PLASTIC (Tar Base) applied cold and all sheets secured in the mortar joint or nailing strip along top edge of base flashing with "Simplex" nails. The exposed surface of the base flashing shall then be covered with a uniform coat of CAREY FLASHING PLASTIC (Tar Base) applied cold, into the surface of which shall be embedded coarse, clean, dry sand or crushed slate. The edges of the felt which extend over the roof surface shall then be stripped with a 9-in. wide strip of 15-lb. CAREY-SEAL TARRED FELT and bonded in place with a mopping of hot Tar Pitch, after which a 4-in. Armco Galvanized cap or counter-flashing shall be inserted into the Schneider Counter-Flashing Receiver and the projecting flange of the receiver shall be bent down over the counter-flashing.

CERTAIN-TEED PRODUCTS CORPORATION

ROOFING DIVISION

Specifications for Built-Up Roofing

GENERAL OFFICES
100 East 42nd Street, NEW YORK, N. Y.

For Sales Offices, see Gypsum Plaster Pages
For Our Other Products, see Manufacturers' Index

CERTAIN-TEED BUILT-UP ROOFS

Advantages—Roofs built up of Certain-teed asphalt roofing and asphalt cement have many advantages.

They can be used on roof decks ranging from flat to vertical surfaces, and are particularly well adapted to sawtooth skylights and valley construction.

TRADE-MARK

Maintenance—Certain-teed Built-up Roofs are practically free of maintenance costs. At the end of the guarantee period, these Certain-teed Roofs can generally be resurfaced with hot asphalt, which prolongs their life for many additional years. This resurfacing process when repeated at certain intervals makes the roof last indefinitely.

Principal Types—We have developed several principal types of built-up asphalt roofs. We recommend these roofs for any type of building upon which a composition roof can be applied.

When the very best roof is desired, we recommend Certain-teed Type "A" and Type "B" Construction Roofs.

Specifications for Certain-teed Type "A" Construction Roof

Guaranteed 15 Years

Note: This specification is applicable where the roof surfaces are of wood sheathing boards, concrete, gypsum tile, cement tile, book tile or steel deck; also for roofs of any pitch, from flat decks to vertical walls; sawtooth roof construction and valleys.

General—All roof (and side wall) surfaces, where indicated on the drawings, shall be covered with Certain-teed Type "A" Construction Roofing in strict accordance with these specifications and the special instructions of the manufacturer.

The surface of all roofs will be left smooth, firm, dry, properly graded to gutters and outlets and free from large cracks or knotholes by the Contractor for Carpenter Work (where the roof deck is of wood) or by the Contractor placing Concrete Construction (where the roof deck is of concrete) ready to receive the work under this contract. Carefully broom and examine all surfaces to be roofed, removing all dirt and debris before applying any materials.

Should any defects or imperfections be found in the construction, this Contractor shall report same to the General Contractor (Owner) to have same corrected before placing any materials.

Note: The required materials and workmanship for the surfaces to receive roofing should be included in the specifications for Mason and Carpenter Work.

Materials—The material shall be two sheets of No. 1 Certain-teed Roofing, weighing 30 lb. to the roll of 108 sq. ft., single thickness, and one sheet (the cap sheet) No. 2 Certain-teed Roofing, weighing 40 lb. to the roll of 108 sq. ft., single thickness, and not less than 150 lb. of Certain-teed Asphalt Cement to the 100 sq. ft. of roof area.

Application—Beginning at the low point of the roof deck, lay one-half sheet of No. 1 Certain-teed Roofing, mopping same to the roof deck with Certain-teed Asphalt Cement applied at a temperature of approximately 350° F., mopping the underneath side of the sheet being laid, its full width, as well as the roof deck. Then lay the second sheet, full width, so that the edge comes even with the outside edge of the half sheet, mopping the underneath side of this sheet its full width, as well as the top surface of the sheet previously laid. Lay the third sheet so that it laps over the second sheet 1 in. more than half its width, mopping both the underneath side of this sheet its full width, and the top surface of the sheet previously laid. In the same manner lay the succeeding layers, completing the roof with the same lap, so that the entire area has two thicknesses of Certain-teed Roofing and 4 moppings of Certain-teed Asphalt Cement at every point. Then lay the cap sheet of No. 2 Certain-teed Roofing, starting at the original low point, mopping the underneath side of this sheet its full width, as well as the top surface of the sheet previously laid. Lap this cap sheet 4 in., thus having 3 thicknesses of roofing and 6 moppings of Certain-teed Asphalt Cement at every point. Finally, the entire top surface shall be mopped over with a uniform coat of hot Certain-teed Asphalt Cement.

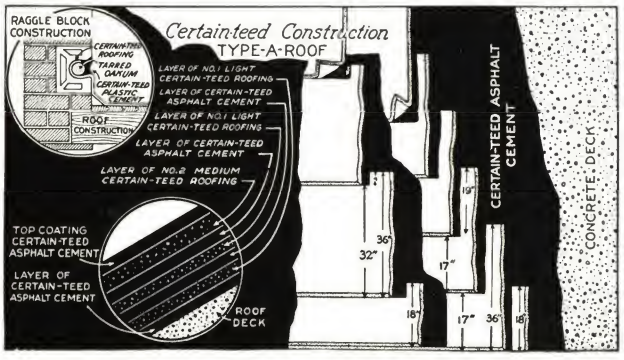
or

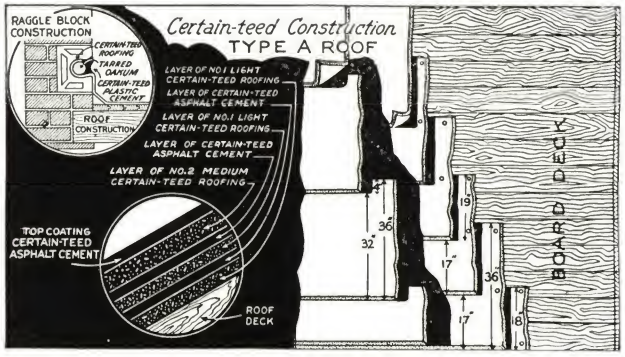
Notes: In cases where the roof surfaces are of board sheathing, the following paragraphs should be substituted.

Where insulation is applied to roof deck before built-up roofing is applied, the specifications for built-up roof over concrete shall be used so that the top surface of the insulation will be mopped the same as a concrete deck roof.

Materials—The material shall be two sheets of No. 1 Certain-teed Roofing, weighing 30 lb. to the roll of 108 sq. ft., single thickness, and one sheet (the cap sheet) No. 2 Certain-teed Roofing, weighing 40 lb. to the roll of 108 sq. ft., single thickness, and not less than 120 lb. of Certain-teed Asphalt Cement to the 100 sq. ft. of roof area.

Application—Beginning at the low point of the roof deck, lay one-half sheet of No. 1 Certain-teed Roofing, nailing with two rows of ⅞-in. large-head roofing nails, staggered, on the upper or back half of the sheet. Lay the second sheet of roofing, full width, so that the edge comes even with the outside edge of the half sheet, mopping the underneath side of this sheet its full width, as well as the top surface of the sheet previously laid, with Certain-teed Asphalt Cement applied at a temperature of approximately 350° F. Lay the third sheet so that it laps over the second sheet 1 in. more than half its width, mopping both the underneath side of this sheet its full width and the top surface of the sheet previously laid. In the





same manner lay the succeeding layers, completing the roof with the same lap, so that the entire area has 2 thicknesses of Certain-teed Roofing and 2 moppings of Certain-teed Asphalt Cement at every point. Then lay the cap sheet of No. 2 Certain-teed Roofing, starting at the original low point, mopping the underneath side of this sheet its full width, as well as the top surface of the sheet previously laid. Lap the cap sheet 4 in., thus having 3 thicknesses of roofing and 4 moppings of Certain-teed Asphalt Cement at every point. Finally, the entire top surface shall be mopped over with a uniform coat of hot Certain-teed Asphalt.

Flashings—Base flashings shall be constructed by extending the roofing up the wall approximately 6 in., reinforcing with a band of No. 3 Certain-teed Roofing approximately 6 in. wide and securing the top edge with standard roofing cleats, unless otherwise specified or shown on the detailed drawings.

Notes: The following notes regarding various types of flashings are suggested for architects' consideration. When other than the above specified flashing is desired the Mason and Carpenter Specifications should include the proper provisions to receive the type of flashing selected, also the above paragraph (Flashings) should be revised accordingly.

Certain-teed flashings can be counterflashed with sheet metal or entered into raggle blocks. If Certain-teed flashing is entered into raggle blocks, same shall be calked in with tarred oakum and pointed up with Certain-teed Plastic Cement mixed with Portland cement. For brick walls, we recommend 50 lb. Certain-teed counterflashing, 12 in. wide, be laid up in the third or fourth course of brick above the roof line by the bricklayer, to be used as counterflashing by the roofer. All concrete or tile walls extending above the roof line, where raggle block or metal counterflashing is not provided, shall have a wood nailing strip embedded 6 or 8 in. above the roof line, so that the top edge of flashing can be permanently secured. The drip edge of concrete decks, vertical walls and curbs, shall be provided with wood nailing strips.

Identification and Labels—The materials above mentioned, shall bear the registered Certain-teed labels of the manufacturer, the CERTAIN-TEED PRODUCTS CORPORATION.

Guarantee—The Contractor, as a condition precedent to final payment, shall execute a written guarantee, guaranteeing the above specified roof for a period of fifteen (15) years from date of completion against all defects in material and workmanship furnished by said roofing contractor, and any such defects shall be repaired free of cost to the Owner. This guarantee does not extend to remote or proximate damages, if any, sustained by purchaser, and the repairing of said roof free of cost as aforesaid shall liquidate guarantor's liability hereunder.

Specifications for Certain-teed Type "B" Construction Roof

Guaranteed 10 Years

Note: This specification is applicable where the roof surfaces are of wood sheathing boards, concrete, gypsum tile, cement tile, book tile or steel deck; also for roofs of any pitch, from flat decks to vertical walls; sawtooth roof construction and valleys.

General—All roofs (and side wall) surfaces, where indicated on the drawings, shall be covered with Certain-teed Type "B" Construction Roofing in strict accordance with these specifications and the special instruction of the manufacturer.

The surface of all roofs will be left smooth, firm, dry, properly graded to gutters and outlets and free from large cracks or knotholes by the Contractor for Carpenter Work (where the roof deck is of wood) or by the Contractor placing concrete construction (where the roof deck is of concrete) ready to receive the work under this contract. Carefully broom and examine all surfaces to be roofed, removing all dirt and debris before applying any materials.

Should any defects or imperfections be found in the construction, this contractor shall report same to the General Contractor (Owner) to have same corrected before placing any materials.

Note: The required materials and workmanship for the surfaces to receive roofing should be included in the specifications for Mason and Carpenter Work.

Materials—The material shall be 2 sheets of No. 1 Certain-teed Roofing, weighing 30 lb. to the roll of 108 sq. ft., single thickness, and not less than 120 lb. of Certain-teed Asphalt Cement to the 100 sq. ft. of roof area.

Application—Beginning at the low point of the roof deck, lay one-half sheet of No. 1 Certain-teed Roofing, mopping same to the roof deck with Certain-teed Asphalt Cement applied at a temperature of approximately 350 degrees F., mopping the underneath side of the sheet being laid, its full width, as well as the roof deck. Then lay the second sheet, which is 36 in. wide, so that the edge comes even with the outside edge of the half sheet, mopping the underneath side of this sheet its full width, as well as the top surface of the sheet previously laid. Lay the third sheet so that it laps over the second sheet 1 in. more than half its width, mopping both the underneath side of this sheet its full width, and the top surface of the sheet previously laid. In the same manner lay the succeeding layers, completing the roof with the same lap, so that the entire area has two thicknesses of Certain-teed Roofing and 4 moppings of Certain-teed Asphalt Cement at every point. Finally, the entire top surface shall be mopped over with a uniform coat of hot Certain-teed Asphalt Cement.

or

Notes: In cases where the roof surfaces are of board sheathing, the following paragraphs should be substituted:

Where insulation is applied to roof deck before built-up roofing is applied, the specifications for built-up roof over concrete shall be used so that the top surface of the insulation will be mopped the same as a concrete deck.

Materials—The material shall be 2 sheets of No. 1 Certain-teed Roofing weighing 30 lb. to the roll of 108 sq. ft., single thickness, and not less than 90 lb. of Certain-teed Asphalt Cement to the 100 sq. ft. of roof area.

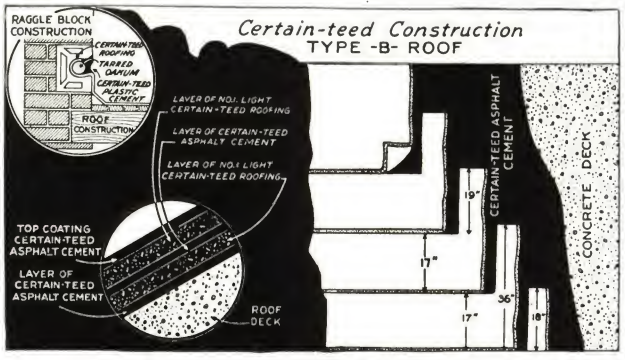
Application—Beginning at the low point of the roof deck, lay one-half sheet of No. 1 Certain-teed Roofing, nailing with two rows of 7/8-in. large-head roofing nails, staggered, on the upper or back half of the sheet. Lay the second sheet of roofing, full width, so that the edge comes even with the outside edges of the half sheet, mopping the underneath side of this sheet its full width, as well as the top surface of the sheet previously laid with Certain-teed Asphalt Cement applied at a temperature of approximately 350 degrees F. Lay the third sheet so that it laps over the second sheet 1 in. more than half its width, mopping both the underneath side of this sheet its full width and the top surface of the sheet previously laid. In the same manner lay the succeeding layers, completing the roof with the same lap, so that the entire area has 2 thicknesses of Certain-teed Roofing and 2 moppings of Certain-teed Asphalt Cement at every point. Finally, the entire top surface shall be mopped over with a uniform coat of hot Certain-teed Asphalt Cement.

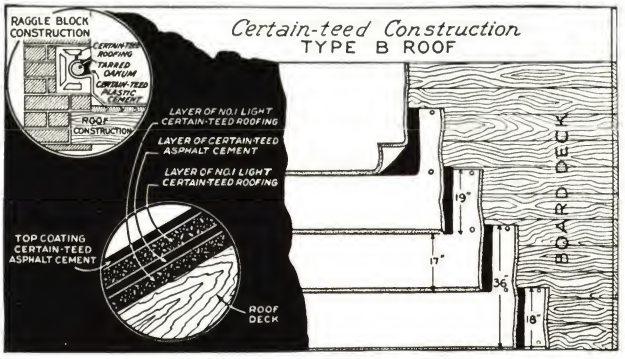
Flashings—Base flashings shall be constructed by extending the roofing up the wall approximately 6 in., reinforcing with a band of No. 3 Certain-teed Roofing approximately 6 in. wide and securing the top edge with standard roofing cleats, unless otherwise specified or shown on the detailed drawings.

Notes: The following notes regarding various types of flashings are suggested for architects' consideration. When other than the above specified flashing is desired the Mason and Carpenter Specifications should include the proper provisions to receive the type of flashing selected; also the above paragraph (Flashings) should be revised accordingly.

Certain-teed flashings can be counterflashed with sheet metal or entered into raggle blocks. If Certain-teed flashing is entered into raggle block, same shall be calked in with tarred oakum and pointed with Certain-teed Plastic Cement mixed with Portland Cement. For brick walls, we recommend 50 lb. Certain-teed counterflashing, 12 in. wide, be laid up in the third or fourth course of brick above the roof line by the bricklayer, to be used as counterflashing by the roofer. All concrete or tile walls extending above the roof line, where raggle block or metal counterflashing is not provided shall have a wood nailing strip embedded 6 to 8 in. above the roof line, so that top edge of flashing can be permanently secured. The drip edge of concrete decks, vertical walls and curbs, shall be provided with wood-nailing strips.

See illustration on second page following.





Identification and Labels—The materials above mentioned shall bear the registered Certain-teed labels of the manufacturer, the CERTAIN-TEED PRODUCTS CORPORATION.

Guarantee—The Contractor, as a condition precedent to final payment, shall execute a written guarantee, guaranteeing the above specified roof for a period of ten (10) years from date of completion against all defects in material and workmanship furnished by said roofing contractor, and any such defects shall be repaired free of cost to the Owner. This guarantee does not extend to remote or proximate damages, if any, sustained by purchaser, and the repairing of said roof free of cost as aforesaid shall liquidate guarantor's liability hereunder.

Certain-teed Asphalt Felt and Asphalt Built-up Roof on Wood and Masonry Surface

Guaranteed 10 Years

This is a form of roofing employed over wood sheathing, concrete, gypsum, cement tile, book tile, steel deck, etc., of any pitch, from a comparatively flat deck to the vertical wall, and is especially recommended for saw-tooth skylight construction and valleys. The roof decks must be smooth and dry, and evenly graded to gutters and outlets. Wood surfaces must be well seasoned and well nailed.

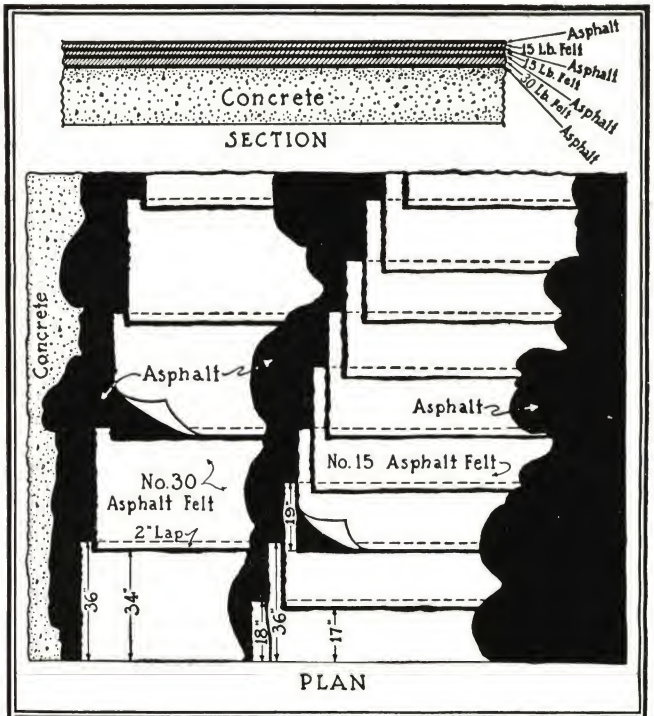
Asphalt Felt and Asphalt Built-up Roof *over masonry* is composed of the following, per square of roof area.

No. 30 Asphalt Saturated Felt per square	30 lb.
No. 15 Asphalt Saturated Felt per square (2 layers 15 lb. each)	30 lb.
Certain-teed Asphalt Cement	120 lb.
Total	180 lb.

When Asphalt Primer is required..... 1 gal.

Asphalt Felt and Asphalt Built-up Roof *over wood* is composed of the following, per square of roof area.

No. 30 Asphalt Saturated Felt per square	30 lb.
No. 15 Asphalt Saturated Felt per square (2 layers 15 lb. each)	30 lb.
Certain-teed Asphalt Cement	90 lb.
Total	150 lb.



CERTAIN-TEED ASPHALT FELT AND ASPHALT BUILT-UP ROOF APPLIED OVER CONCRETE DECK

Specifications for Certain-teed Asphalt Felt and Asphalt Built-up Roof on Masonry Surface

Notes: This roof is guaranteed for 10 years.

This specification is applicable where the roof surfaces are of concrete, gypsum tile, cement tile, book tile, steel deck, etc.; also for roofs of any pitch, from flat decks to vertical walls; sawtooth roof construction and valleys.

General—All roof (and side wall) surfaces, where indicated on the drawings, shall be covered with Certain-teed Asphalt Felt and Asphalt Built-up Roofing in strict accordance with these specifications and the special instructions of the manufacturer.

The surface of all roofs will be left smooth, firm, dry, properly graded to gutters and outlets and free from large cracks by the Contractor placing the concrete construction ready to receive the work under this contract. Carefully broom and examine all surfaces to be roofed, removing all dirt and debris before applying any materials.

Should any defects or imperfections be found in construction, this Contractor shall report same to the General Contractor (Owner) to have same corrected before placing any materials.

Note: The required materials and workmanship for the surfaces to receive roofing should be included in the specifications for Mason Work.

Material—The material shall be one sheet of No. 30 Certain-teed Asphalt Felt, weighing approximately 30 lb. per 108 sq. ft., single thickness, and 2 sheets of No. 15 Certain-teed Asphalt Saturated Rag Felt, weighing approximately 15 lb. per 108 sq. ft., single thickness (the felt shall be 36 in. wide), and not less than 120 lb. of Certain-teed Asphalt Cement to the 100 sq. ft. of roof area. Asphalt to be applied at a temperature of approximately 350 degrees F.

Note: Where a priming coat is desired on the surfaces to be covered, include the following paragraph under above heading (Material):

(For the priming coat use not less than one gal. to 100 sq. ft. of Certain-teed Liquid Asphalt Cement, applied cold.)

Application—All surfaces to be covered shall receive a priming coat of Certain-teed Liquid Asphalt Cement, applied cold and well brushed in, using not less than 1 gal. to 100 sq. ft. Primer shall be allowed to dry before applying the hot asphalt.

Note: If primer is not desired, omit the above paragraph.

Beginning at the low point of the roof deck, lay one layer of 30 lb. Certain-teed Asphalt Felt, lapping each sheet 2 in., mopping same to the roof deck with approximately 30 lb. Certain-teed Asphalt Cement to the square. Over the 30 lb. Asphalt Saturated Felt thus laid, mop approximately 30 lb. of Certain-teed Asphalt Cement to the square, into which, while hot, lay 2 layers of 15 lb. Certain-teed Asphalt Felt (starting with one-half sheet), lapping each sheet 19 in. and mopping between sheets the full width of the lap with Certain-teed Asphalt Cement, using approximately 30 lb. of asphalt per square. Over the entire surface of the felt thus laid, mop a uniform coat of Certain-teed Asphalt Cement, using approximately 30 lb. of asphalt per square. This final or top coating shall be applied as the work progresses so that the felt shall not be left exposed.

Flashings—Base flashings shall be constructed by extending the felt up the wall not less than 6 in. Over the base flashing mop a strip of 15 lb. Asphalt Saturated Felt approximately 6 in. wide, the top edge of the felt shall be secured with a standard roofing cleat, unless otherwise specified or shown on the detailed drawings.

Notes: The following notes regarding various types of flashings are suggested for architects' consideration. When other than the above specified flashing is desired the Mason and Carpenter Specifications should include the proper provisions to receive the type of flashing selected, also the above paragraph (Flashings) should be revised accordingly.

Base flashings can be counterflashed with sheet metal or entered into raggle blocks. If the asphalt felt base flashing is entered into raggle blocks, it shall be calked in with tarred oakum and pointed up with Certain-teed Plastic Cement mixed with Portland Cement. All concrete or tile walls extending above the roof line where raggle block or metal counterflashing is not provided, shall have a wood nailing strip embedded 6 or 8 in. above the roof line so that the top edge of the flashing can be permanently secured.

Identification and Labels—The materials above mentioned, shall bear the registered Certain-teed label of the manufacturer, the CERTAIN-TEED PRODUCTS CORPORATION.

Guarantee—The Contractor, as a condition precedent to final payment, shall execute a written guarantee, guaranteeing the above specified roof for a period of ten years from date of completion against all defects in material and workmanship furnished by said roofing contractor, and any such defects shall be repaired free of cost to the Owner. This guarantee does not extend to remote or proximate damages, if any, sustained by purchaser, and the repairing of said roof free of cost as aforesaid shall liquidate guarantor's liability hereunder.

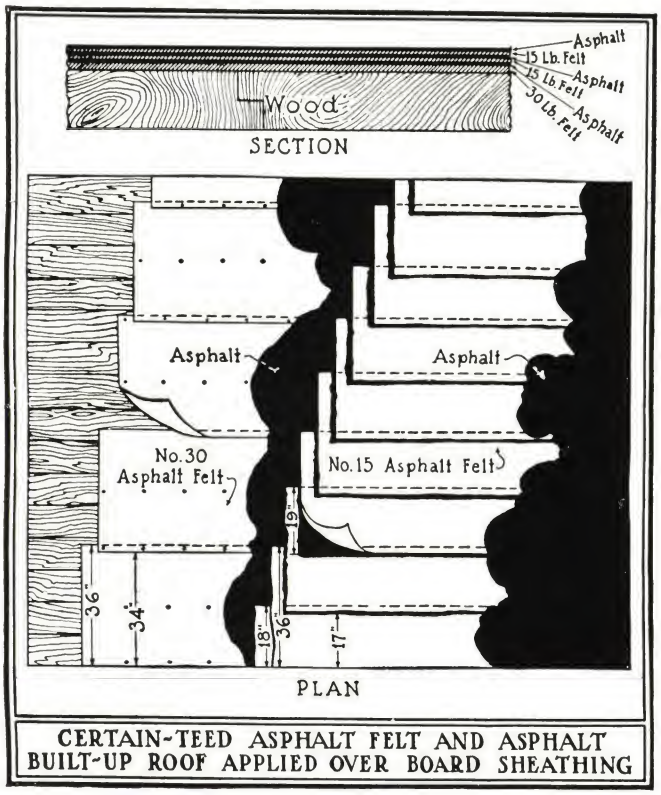
Specifications for Certain-teed Asphalt Felt and Asphalt Built-up Roof on Board Sheathing

Notes: This roof is guaranteed for 10 years.

This specification is applicable where the roof surfaces are of wood sheathing; also for roofs of any pitch, from flat decks to vertical walls; sawtooth roof construction and valleys.

General—All roof (and side wall) surfaces, where indicated on the drawings, shall be covered with Certain-teed Asphalt Felt and Asphalt Built-up Roofing in strict accordance with these specifications and the special instructions of the manufacturer.

The surface of all roofs will be left smooth, firm, dry, properly graded to gutters and outlets and free from large



CERTAIN-TEED ASPHALT FELT AND ASPHALT BUILT-UP ROOF APPLIED OVER BOARD SHEATHING

cracks or knotholes by the Contractor for Carpenter Work ready to receive the work under this contract. Carefully broom and examine all surfaces to be roofed, removing all dirt and debris before applying any materials.

Should any defects or imperfections be found in the construction, this Contractor shall report same to the General Contractor (Owner) to have same corrected before placing any materials.

Note: The required materials and workmanship for the surfaces to receive roofing should be included in the specifications for Carpenter Work.

Material—The material shall be one sheet of No. 30 Certain-teed Asphalt Felt, weighing approximately 30 lb. per 108 sq. ft., single thickness, and 2 sheets of No. 15 Certain-teed Asphalt Saturated Rag Felt, weighing approximately 15 lb. per 108 sq. ft., single thickness (the felt shall be 36 in. wide), and not less than 90 lb. of Certain-teed Asphalt Cement to the 100 sq. ft. of roof area. Asphalt to be applied at a temperature of approximately 350 degrees F.

Application—Beginning at the low point of the roof deck, lay one layer of 30 lb. Certain-teed Asphalt Felt, lapping each sheet 2 in. and nailing through the laps and longitudinal centers with large-head, barbed roofing nails, 12 in. on center. Over the 30 lb. Asphalt Saturated Felt thus laid, mop approximately 30 lb. of Certain-teed Asphalt Cement, into which, while hot, lay 2 layers of 15 lb. Certain-teed Asphalt Felt (starting with one-half sheet), lapping each sheet 19 in. and mopping between sheets the full width of the lap with Certain-teed Asphalt Cement, using approximately 30 lb. of asphalt per square.

Over the entire surface of the felt thus laid, mop a uniform coat of Certain-teed Asphalt Cement, using approximately 30 lb. of asphalt per square. This final or top coating shall be applied as the work progresses so that the felt shall not be left exposed.

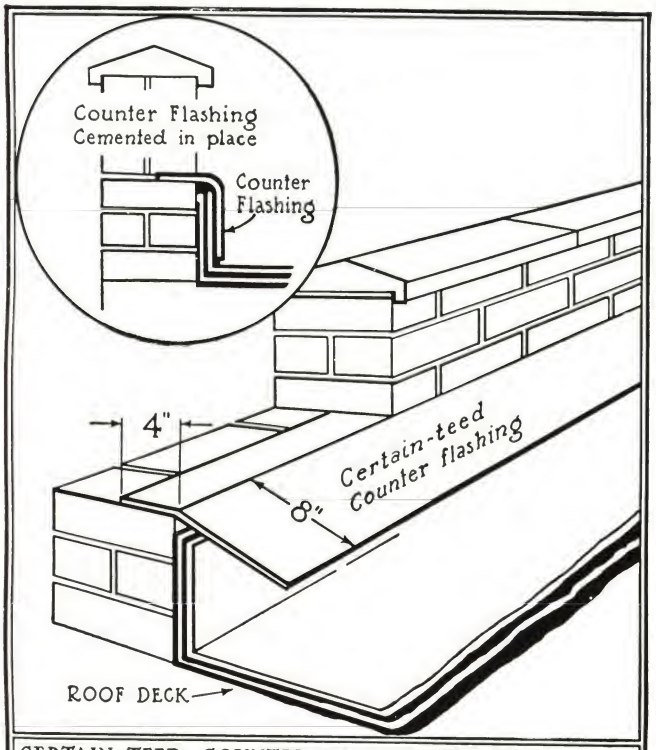
Flashings—Base flashings shall be constructed by extending the felt up the wall not less than 6 in. Over the base flashing mop a strip of 15 lb. Asphalt Saturated Felt approximately 6 in. wide, the top edge of the felt shall be secured with a standard roofing cleat, unless otherwise specified or shown on the detailed drawings.

Notes: The following notes regarding various types of flashings are suggested for architects' consideration. When other than the above specified flashing is desired the Mason and Carpenter Specifications should include the proper provisions to receive the type of flashing selected, also the above paragraph (Flashing) should be revised accordingly.

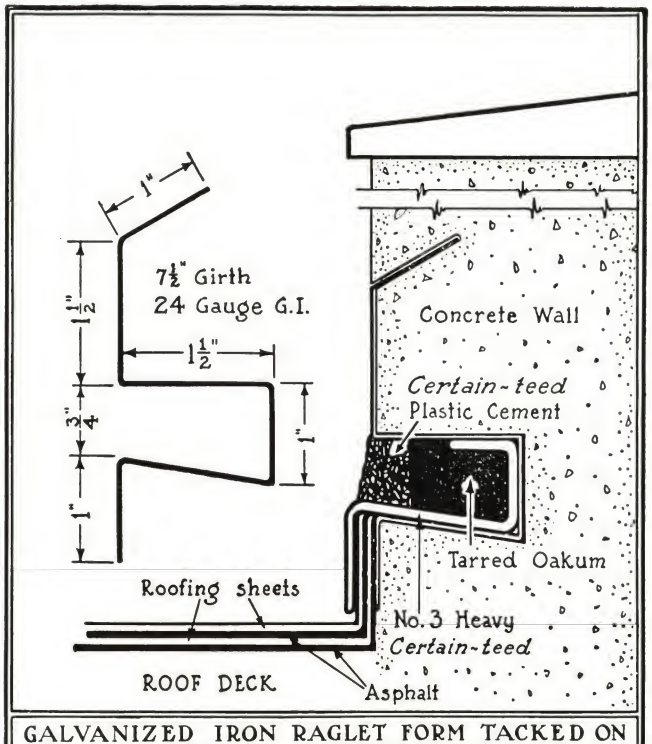
Base flashings can be counterflashed with sheet metal or entered into raggle blocks. If the asphalt felt base flashing is entered into raggle blocks, it shall be calked in with tarred oakum and pointed up with Certain-teed Plastic Cement mixed with Portland Cement. All concrete or tile walls extending above the roof line where raggle block or metal counterflashing is not provided, shall have a wood nailing strip embedded 6 or 8 in. above the roof line so that the top edge of the flashing can be permanently secured.

Identification and Labels—The materials above mentioned shall bear the registered Certain-teed labels of the manufacturer, the CERTAIN-TEED PRODUCTS CORPORATION.

Guarantee—The Contractor, as a condition precedent to final payment, shall execute a written guarantee, guaranteeing the above specified roof for a period of ten (10) years from date of completion against all defects in material and workmanship furnished by said roofing contractor, and any such defects shall be repaired free of cost to the Owner. This guarantee does not extend to remote or proximate damages, if any, sustained by purchaser, and the repairing of roof free of cost as aforesaid shall liquidate guarantor's liability hereunder.



CERTAIN-TEED COUNTER FLASHING FOR BRICK WALLS



GALVANIZED IRON RAGLET FORM TACKED ON INSIDE OF FORMS FOR CONCRETE WALLS

KOPPERS PRODUCTS COMPANY

Coal Tar Products for Roofing, Waterproofing, Wood Preserving, Painting and Paving

GENERAL OFFICES

Koppers Building, PITTSBURGH, PA.

BRANCH OFFICES

NEW YORK, N. Y.
Harrison Turnpike
Kearney, N. J.

CHICAGO, ILL.
39th Street & 52nd Avenue
Cicero, Ill.

PROVIDENCE, R. I.
1107 Industrial Trust Building

BIRMINGHAM, ALA.
P. O. Box 304
Bessemer, Ala.

PLANTS

BIRMINGHAM, ALA. — CHICAGO, ILL. — FOLLANSBEE, W. VA. — HAMILTON, OHIO — KEARNY, N. J. — MILWAUKEE, WIS.
NEW HAVEN, CONN. — PROVIDENCE, R. I. — ST. LOUIS, MO. — ST. PAUL, MINN. — UTICA, N. Y. — YOUNGSTOWN, OHIO

Products

KOPPERS BUILT-UP ROOFING:
- KOPPERS Old Style Pitch
- KOPPERS Tarred Felt
- KOPPERS Flashing

KOPPERS MEMBRANE WATERPROOFING:
- KOPPERS Coal Tar Saturated Fabric
- KOPPERS Waterproofing Pitch
- KOPPERS Tarred Felt

KOPPERS HIGH PENETRATION WATERPROOFING:
- KOPPERS H P Primer
- KOPPERS Seal Coat
- KOPPERS Dampproofing Paint

Features of the Koppers Built-up Roof

A Koppers Roof Is Long Lived—A low-cost roof built of pure coal-tar-pitch and the highest grade of tarred felt, armored on top with gravel or slag. It withstands severest weather conditions for 20, 30—even 40 years.

Koppers Will Issue a Maintenance Bond on Roofing and Flashing—Issued for 10, 15 or 20 years, when applied according to their specifications. This bond is optional and the same roof may be obtained without paying the additional charge for the bond. However, when you specify a Koppers Bonded Roof and Flashing you are protected against any maintenance cost for the period of the bond.

All Koppers Bonded Roofs Are Inspected by Us During the Course of Application—They must pass our rigid requirements before we will issue the bond. (See "Specifications for Koppers Roofs," A.I.A. File 12b11.)

Koppers Roofs Will Take a Class "A" Fire Underwriters' Rating—This is the highest rating obtainable.

The Gravel or Slag on Top of a Koppers Roof Performs the Duty of Fireproofing and Protecting from Mechanical Injury—The gravel or slag armor on top prevents fire, ice, sleet, hail, heavy rains and winds from damaging the roof and impairing its waterproof qualities.

Koppers Roofs Contain More Bitumen—The use of gravel or slag to protect the final pouring of pitch permits a heavy layer of pitch to be used for this purpose, thereby increasing the amount of bitumen on the roof.

A Koppers Roof Has Considerable Insulating Value—This is due to the large amount of bitumen, the thorough mopping of Koppers Old Style Pitch according to Koppers specifications, and because of the quantity of gravel or slag used on the surface.

Koppers Roofs Are Safe Against Damage from Deck Movement—Concrete, gypsum and other decks expand and contract, causing considerable damage to certain types of built-up roofs. The high ductility of a Koppers Roof insures against cracking.

Koppers Roofs Require No Re-coating—The first cost is the last and only cost. The cost of re-surfacing short-lived roofings averages about $1.00 per square, every three to five years—which must be added to the first cost in determining the true cost of such a roof.

A Pitch Roof Will Heal Itself at the First Warm Weather—This is one of the distinctive qualities of coal-tar-pitch; it welds itself, and seals up any minor cuts.

KOPPERS

Blisters and Gas Pockets Are Extremely Rare—This is true in roofs built-up of pure coal-tar products. The weight of the gravel armor on top of a Koppers Roof prevents pockets of any kind from getting a start.

Koppers Membrane Waterproofing

Koppers now manufacture the following products for use in the construction of membrane waterproofing:

Koppers Waterproofing Fabric—*Koppers Waterproofing Fabric* is an open mesh cotton fabric, which has been thoroughly saturated with a pure coal tar compound. This product complies with A.S.T.M. Specification D173-27.

Koppers Waterproofing Pitch—*Koppers Waterproofing Pitch* contains nothing except pure coal-tar products. The chemical stability of coal-tar-pitch under water has been proven many times.

Koppers Tarred Felt—A pure *coal-tar saturated felt* which is made to meet all standard specifications.

Application—*Koppers Membrane Waterproofing* is composed of alternate layers of Koppers Waterproofing Felt or Fabric and Koppers Waterproofing Pitch. The number of plies of fabric or tarred felt and pitch will depend upon the conditions encountered by the engineer or architect when he is preparing his design. On side walls and other head situations three to four plies of fabric or felt and four to five moppings of pitch are usually applied. Where the head of water is great as many as six plies of fabric or felt and seven moppings of pitch are employed.

For detailed specifications regarding application, write to the nearest District Office or to our Main Office.

Koppers High Penetration Waterproofing

Koppers High Penetration Waterproofing for concrete consists of Koppers H P Primer and Koppers Seal Coat. We recommend that at least four coats of Koppers H. P. Primer be applied to the concrete allowing this to penetrate thoroughly, then apply one coat of Koppers Seal Coat. This form of waterproofing is used for protecting concrete against alkali attacks, for guarding concrete against erosion when it is subject to the flow of water at high velocity, and for waterproofing exposed surfaces of concrete where membrane waterproofing would be punctured.

Koppers Dampproofing Paint

Koppers Dampproofing Paint is applied cold—no heating is required. It does not give as deep a penetration as Koppers High Penetration Waterproofing method but is used where inexpensive yet effective waterproofing is desired.

Specifications

For detailed information regarding our Roofing or Waterproofing Specifications, get in touch with our District Offices or Main Office.

Special Notice

The sale and distribution of all products of American Tar Products Company, Koppers Products Company and Tar Products Corporation have been consolidated and unified under the name KOPPERS PRODUCTS COMPANY.

ARCHITECT'S MANUAL

BUILT-UP ROOFS

THE RICHARDSON ROOFING COMPANY
DIVISION OF THE FLINTKOTE COMPANY
NEW YORK, N. Y. BOSTON, MASS. CHICAGO, ILL.
NEW ORLEANS, LA. CINCINNATI, OHIO
ATLANTA, GA. DALLAS, TEX.

RICHARDSON BUILT-UP ROOFING

THE RICHARDSON ROOFING COMPANY
DIVISION OF THE FLINTKOTE COMPANY
NEW YORK, N. Y.

MANUFACTURERS OF ROOFING FOR A QUARTER CENTURY

A quarter of a century's successful experience as one of the foremost manufacturers of roofing products is an indisputable guarantee, not only of the product but of the integrity and practical knowledge of the company which manufactures it.

THE FLINTKOTE COMPANY has been successful because it has always been progressive—eagerly anticipating every forward step in the betterment of its products and the accompanying service to architects, engineers and builders. Toward this end THE FLINTKOTE COMPANY maintains a large force of chemists and engineers whose constant duty is to test and improve Flintkote Roofing Products, and make them constantly better than before. All the quality elements which an actively advancing science and technology are developing are constantly being incorporated in Flintkote products. Enterprising and far-seeing manufacturers are producing vastly superior goods by intelligently studying their processes and adopting methods which produce a uniform product of highest standard.

Eight factories from coast to coast, financial resources, large production, and the most modern equipment and methods, all contribute to the excellence of Flintkote products and service.

ENGINEERING ROOFING SERVICE

Flintkote Sales Engineers are prepared to furnish definite recommendations as to the correct type of roof to be used with your construction. Their recommendations are based on a thorough background of experience, both from the practical and engineering standpoints of waterproofing.

THE FLINTKOTE COMPANY also maintains a corps of specially trained and experienced roofing engineers at the main offices in New York, N. Y. Any special problem may be referred to them for prompt and thorough investigation and solution.

Much time and money will be saved if roofing work is planned in advance. For example, when property lines interfere, it is necessary to build the wall against the roofing membrane, the membrane being held directly against the brick or concrete which has been built first. Proper planning will often eliminate unnecessary expenditures, and will prevent interference with subsequent roofing work.

Waterproofing cannot be expected to correct poor or faulty construction. It is simply a means of preventing water from entering a structure and it does this by throwing the water to properly placed outlets and drains. Hence the structure should be designed to help accomplish this end most effectively.

When you specify a Richardson Built-up Roof, you can be assured of two things:

First, a pliant, durable, adhesive, waterproofing bitumen, free from destructive elements and absolutely impervious to water.

Second, a felt foundation which, in spite of severe weathering, will hold this bitumen in place.

These, together, fulfill the basic requirements for permanent roofing.

To meet the various problems of a particular roofing installation, architects, engineers, builders and owners are invited to avail themselves of the Company's facilities for information and service.

FLINTKOTE ROOFING POLICY AND MATERIALS

Richardson Built-up Roofs are built up on the structure, layer by layer, of materials best suited for the construction. These materials are our own products, and are manufactured under close supervision.

Because of the complete control of manufacture of Viskalt Compound and Richardson Felt, Viskalt Saturated, we are able to furnish the same high grade material, identical in all respects, from all of our shipping points. This uniformity makes it a safe product to specify in any part of the country.

The application of Richardson Built-up Roofs is a very important feature. Richardson Bonded Built-up Roofs are applied by experienced and thoroughly trained roofers, under the supervision of qualified inspectors. This insures a roof built to exact specifications and construction as authorized by the Richardson Roofing Company.

Cost

The Richardson Roofing Company Division of The Flintkote Company recognizes the fact that there are many different classes of buildings for which good roofs are in demand but that for many of these, first cost cannot be allowed to mount too high, either because the construction of the building is of a type that does not warrant a roof of high first cost, or because the cost is in excess of money alloted, or because the intended life of the building is too short. In line with this thought the Richardson Specifications have been made complete, by incorporating the following types of construction for terms of years:

(1) Richardson Smooth Surfaced Asphalt Roofs
(2) Richardson Gravel or Slag Surfaced Asphalt Roofs
(3) Richardson Mineral Surfaced Asphalt Roofs
(4) Richardson Coal Tar Felt and Pitch Roofs

All of the above roofs will be bonded if desired.

What Is the Best Roof?

Because roofs must withstand a variety of exposure conditions, the Richardson Built-up Specifications on the following pages have been prepared to meet as far as possible the conditions to which any roof will be subjected.

Before a recommendation is made, certain definite data should be obtained. The following questions should be answered intelligently to permit real practical service:

What is the roof deck going to be—concrete, tile, gypsum or wood sheathing?

What kind of flashing is to be used?

What is the pitch of the roof?

What temperature conditions must the roof stand?

What atmospheric conditions must the roof stand?

Will the roof be subjected to acid conditions, smoke, gas or cinders?

With this information, the specification that will best suit the conditions can be selected. A roofing which may be best for the flat roof of an office building will not be suitable for an industrial building where the incline is greater than two inches to the foot.

RICHARDSON BONDED ROOFS AND FRANCHISED ROOFERS

Richardson Built-up Roofs when applied in strict accordance with printed specifications, and under the supervision of the Inspection Service will be bonded if desired. Depending upon the type of roofing used and upon the conditions, these bonds run for periods of twenty, fifteen and ten years. In connection with the bonding of these built-up roofs, a periodic inspection service is also supplied.

Richardson Roofs will be bonded for every type of construction, whether flat or steep, regardless of the pitch of any section of the roof area. No limitations are placed on bonding roofs of any considerable pitch.

The new Richardson policy further recognizes the fact that the flashings are a critical point of a roof, and have, therefore, decided to issue a "Flashing Endorsement," which, when issued, becomes a part of the "Bond" itself. This feature covers a period of ten years and is issued under the same conditions as the Bond.

All Richardson Built-up Roofs will be laid only by Roofing Contractors approved and franchised by the Richardson Roofing Company. These Contractors have been selected because they possess the requirements of business reliability, thorough experience and careful workmanship to fulfill the Richardson Roofing Specifications. Roofing laid by Richardson Franchise Roofing Contractors gives assurance of satisfactory workmanship and the complete following of the printed specifications.

In regard to bonded built-up roofs, The Richardson Roofing Company stresses the point that the Felt, Viskalt Saturated, and the Viskalt Compound called for in the following specifications are made to very exacting formulæ and are, in the opinion of THE FLINTKOTE COMPANY, the best material that it is possible to produce. They are, therefore, specified for all Bonded Roofs. These products are sold at established prices, regardless of whether a bond is furnished or not. All charges for the bond itself is on a "per square" basis, being separate and distinct from the cost of the materials.

SELECTING THE PROPER ROOF FINISH

Conditions Determining the Proper Type of Roofing to Use

In selecting the proper roof finish, the determining factors are as follows:

(1) Base on which roof is to be laid—(Concrete, gypsum, wood, etc.).

(2) Quality of roof—(20-year, 15-year, 10-year, 5-year).

(3) Pitch—(Limitation of type of roof).

(4) Finish—(Smooth, crushed slate, slag, gravel).

Conditions Nos. 1-2-3—Are readily determined as they are based on established conditions known at the time the built-up roof is decided upon.

Condition No. 4 Type of Finish—

Steep Roofs—The question of surface for steep roofs is merely a matter of preference as to whether color and texture is desired on the steep surface or whether a smooth black surface is satisfactory.

Flat Roofs—Here again it is more or less a matter of individual preference as to whether a smooth Viskalt surface or a Slag and Gravel surface is desired except that slag or gravel cannot be used for pitches exceeding 3 inches to 1 foot.

CONDENSED CHART OF RICHARDSON BUILT-UP ROOFINGS AND SPECIFICATIONS

Period of guarantee	Specification designation	Limitations of roof pitch	Surface finish	Construction: Number of plies of felt	Construction: Number of asphalt moppings	Material weights, lb.: Felt	Viskalt	Flex-a-tile asphalt	Slag surfacing	Gravel surfacing	Rex construction	Special base sheet	Weight per square applied, lb.: Smooth or slate surfaced	Gravel surfacing	Slag surfacing	Weight waterproofing factor, lb.: Asphalt	Weight reinforcing factor lb.: Felt
Standard Specifications Non-combustible Roofs (Concrete, Gypsum, etc.)																	
20 yr.	A-1-C	None	Smooth	Five 15-lb. felts	6	75	162	.....	.....	.....	.....	.....	246	.....	.....	213	33
20 yr.	A-2-C	Up to 6 in. to 1 ft.	Crushed slate	Three 15-lb. felts; One Rex construction (slate)	5	45	130	.....	.....	.....	100	.....	284	.....	.....	214	70
20 yr.	A-3-C	Up to 3 in. to 1 ft.	Gravel or slag	Four 15-lb. felts	5	60	.....	180	300	400	.....	.....	.....	649	549	223	26
20 yr.	A-4-C	1 in. to 1 ft.	Tar or slag	Three 15-lb. felts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15 yr.	B-1-C	None	Smooth	Four 15-lb. felts	5	60	135	.....	.....	.....	.....	.....	204	.....	.....	178	26
15 yr.	B-3-C	Up to 3 in. to 1 ft.	Gravel or slag	One 30-lb. felt; Two 15-lb. felts	4	60	.....	140	300	400	.....	.....	.....	609	509	183	26
10 yr.	C-1-C	None	Smooth	Three 15-lb. felts	4	45	108	.....	.....	.....	.....	.....	162	.....	.....	143	19
10 yr.	C-1a-C	Up to 3 in. to 1 ft.	Smooth	One 30-lb. felt; Two 15-lb. felts	4	60	108	.....	.....	.....	.....	.....	177	.....	.....	151	26
10 yr.	C-2-C	Up to 6 in. to 1 ft.	Crushed slate	Two 15-lb. felts; One Rex construction (slate)	4	30	108	.....	.....	.....	100	.....	247	.....	.....	206	41
10 yr.	C-3-C	Up to 3 in. to 1 ft.	Gravel or slag	Three 15-lb. felts	4	45	.....	150	300	400	.....	.....	.....	604	504	185	19
10 yr.	C-4-C	Up to 1 in. to 1 ft.	Tar and slag	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Note: Use not less than one (1) gallon of Asphalt Primer per square on above specifications. Weight, approximately 9 lb.

Standard Specifications Wood Roofs																	
20 yr.	A-1-W	None	Smooth	One base sheet; Four 15-lb. felts	5	60	135	.....	.....	.....	.....	34	229	.....	.....	167	62
20-yr.	A-2-W	Up to 6 in. to 1 ft.	Crushed slate	One base sheet; Two 15-lb. felts; One Rex construction (slate)	4	30	.....	108	.....	.....	100	34	272	.....	.....	220	52
20 yr.	A-3-W	Up to 3 in. to 1 ft.	Gravel or slag	One 30-lb. felt; Three 15-lb. felts	4	75	.....	140	300	400	.....	.....	.....	615	515	184	31
20 yr.	A-4-W	Up to 2 in. to 1 ft.	Tar or slag	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15 yr.	B-1-W	None	Smooth	One base sheet; Three 15-lb. felts	4	45	108	.....	.....	.....	.....	34	187	.....	.....	129	58
15 yr.	B-3-W	Not over 4 in. to 1 ft.	Gravel or slag	Four 15-lb. felts	4	60	140	.....	300	400	.....	.....	.....	600	500	174	26
10 yr.	C-1-W	None	Smooth	One 30-lb. felt; Two 15-lb. felts	3	60	81	.....	.....	.....	.....	.....	141	.....	.....	115	26
10 yr.	C-2-W	Up to 6 in. to 1 ft.	Crushed slate	One K-B sheathing; Two 15-lb. felts; One Rex construction (slate)	3	38	81	.....	.....	.....	100	.....	219	.....	.....	172	47
10 yr.	C-3-W	Up to 4 in. to 1 ft.	Gravel or slag	One 30-lb. felt; Two 15-lb. felts	3	60	.....	110	300	400	.....	.....	.....	570	470	144	26
10 yr.	C-4-W	Up to 2 in. to 1 ft.	Tar or slag	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5 yr.	D-1-W	None	Smooth	One special base; One 15-lb. felt	2	15	54	.....	.....	.....	.....	34	103	.....	.....	84	19
Standard Specifications Steel Roofs*																	
20 yr.	A-1-S	None	Smooth	One 30-lb. felt; Three 15-lb. felts	5	75	135	.....	.....	.....	.....	.....	210	.....	.....	152	58
20 yr.	A-3-S	3 in. to 1 ft.	Gravel or slag	Four 15-lb. felts	5	60	.....	150	300	400	.....	.....	.....	610	510	184	26
10 yr.	C-1-S	None	Smooth	Three 15-lb. felts	4	45	108	.....	.....	.....	.....	.....	153	.....	.....	134	19
10 yr.	C-3-S	3 in. to 1 ft.	Gravel or slag	Three 15-lb. felts	4	45	.....	120	300	400	.....	.....	.....	565	465	146	19
5 yr.	D-1-S	None	Smooth	Two 15-lb. felts	3	30	81	.....	.....	.....	.....	.....	111	.....	.....	98	13
Standard Specifications Over Rigid Insulation, Cork, Celotex, Insulite, Maftex, etc.																	
20 yr.	A-1-I	None	Smooth	One 30-lb. felt; Three 30-lb. felts	5	75	135	.....	.....	.....	.....	.....	210	.....	.....	152	58
20 yr.	A-2-I	None	Crushed slate	Three 15-lb. felts; One Rex construction (slate)	5	45	150	.....	.....	.....	100	.....	295	.....	.....	225	70
20 yr.	A-3-I	3 in. to 1 ft.	Gravel or slag	Four 15-lb. felts	5	60	.....	150	300	400	.....	.....	.....	610	510	184	26
10 yr.	C-1-I	None	Smooth	One 30-lb. felt and Two 15 lb. felts, *or* Three 15-lb. felts	4 4	60 45	108 108	.....	.....	.....	.....	.....	168 153	.....	.....	142 135	26 19
10 yr.	C-2-I	None	Crushed slate	Two 15-lb. felts; One Rex construction (slate)	4	30	120	.....	.....	.....	100	.....	250	.....	.....	209	41
10 yr.	C-3-I	3 in. to 1 ft.	Gravel or slag	Three 15-lb. felts	4	45	.....	120	300	400	.....	.....	.....	565	465	146	19

*Special specifications for use with insulation will be sent upon request.

RICHARDSON ROOFING PRODUCTS

VISKALT ROOFING COMPOUND

An Especially Refined Asphalt Used for Smooth Asphalt and Slate Surfaced Finishes

New Facts Regarding the Composition of Roofing and Waterproofing

Scientific investigation has uncovered facts which have put the selection of roofing and waterproofing materials on an entirely new basis. A knowledge of these facts will help make future roofing and waterproofing construction more permanent.

According to the science of roof construction, the two basic materials needed to make a permanent roof, are the following:

(1) A bitumen which is firm yet pliant, durable, adhesive, waterproof and free from destructive elements and absolutely impervious to water.

(2) A felt foundation which, in spite of severe weathering, will permanently act as a reinforcement to hold this bitumen fast to the roof.

In the past, not enough effort was made to develop the waterproofing agent, the bitumen, to fit its particular job. Even though the most capable architect or engineer planned a theoretically correct system of waterproofing, both of these men would confess that they knew little or nothing about the actual waterproofing agent, the bitumen.

With these facts in mind, the Richardson Research Laboratories concentrated its years of scientific experience to solve the difficulty. The result was Viskalt—a blend of waterproofing bitumen more efficient than had ever been devised.

All Asphalts Are Not Good Waterproofing Agents

In all waterproofing bitumens, there are certain essential constituents. Up to a few years ago, these were thought to be the backbone of bitumen. Consequently all bitumens were considered alike and no one really knew why, for example, some roofs outlasted others.

But now research has proved that in asphaltic bitumen are certain constituents which, if not properly proportioned, destroy its waterproofing value. Thus the cause of a leaky roof might chemically be explained as follows:

The newly discovered elements tend to break down the waterproofing film and let in the water.

Many asphalts, it is now known, contain high percentages of these harmful elements. Viskalt, on the other hand, is derived from asphaltums which contain a smaller percentage of these harmful properties.

Viskalt is a firm, adhesive waterproofing bitumen and as such fulfills the first basic requirement of permanent waterproofing—a continuous, unbroken layer, absolutely impervious to water.

Every modern structure requires a certain amount of flexibility in each part so as to care for strains and stresses due to wind pressure, ground movement, unusual loads, seasoning, etc. In the past much damage has been done to otherwise excellent structures because the waterproofing cracked and broke down under strain.

This breaking down is due to the evaporation, at sun or working temperatures, of certain deficiencies in the physical characteristics of the asphalt which cause brittleness and subsequent cracking.

Firm—Yet Pliant Under Stress

Viskalt, when maintained for five hours at a temperature of 325° F. shows an evaporation of less than ½ of 1% and still remains pliant.

Ordinary bitumens crack or crumble when subject to tension or pressure. But Viskalt, as shown by the ductility test, is internally knitted together to resist such strains.

Without the aid of a fluxing agent, ordinary bitumens are not highly adhesive. Viskalt, however, as proved by actual use, binds itself fast both to the felt and to the structure.

Ordinary bitumens are extremely brittle at even 40° F. and flow at summer temperatures. Viskalt, on the contrary, being only slightly susceptible to such ranges of temperature, remains firm yet *pliant under stress.*

When Viskalt is used on the roof you may feel absolutely confident that it will remain a continuous, unbroken layer, absolutely impervious to water.

Viskalt Specifications

Melting point (ball and ring)—167° to 175° F.
Penetration at 32° F. (0° C.) 200 gr. 60 sec.—18.
Penetration at 77° F. (25° C.) 100 gr. 5 sec.—35.
Penetration at 115° F. (46° C.) 50 gr. 5 sec.—110.
Ductility at 77° F.—5 cm. (not less than).
Purity (solubility in carbon bisulphite)—99½% (not less than).
Flash point (open cup) 465° F. (not less than).
Weight—approximately 8.7 lb. per gal.
Furnished in 10 gal. containers. Covering capacity approximately 30 lb. (or 3 gal.) per 100 sq. ft.

Viskalt Roofing Compound is manufactured in our refineries, of Asphalt and Asphalt Flux, so tempered as to overcome brittleness and yet retain its weather resisting qualities. Our specifications are rigid and assure the production of a product which meets the most exacting of roofing requirements.

FLEX-A-TILE ASPHALT

A High Grade Asphalt Used with Slag or Gravel Surfaced Roofs

A pure refined asphalt manufactured especially for roofing work, but not recommended for use on pitches over 3 inches to the foot. Produced for use with slag or gravel surfaced roofs.

VISKALT CONCRETE PRIMER

A Priming Coat for Concrete or Gypsum Roof Decks, Also for Priming Walls to be Waterproofed

Viskalt Concrete Primer is especially prepared for use on poured concrete or gypsum decks in connection with the highest grade Viskalt 20-year and 15-year construction.

It is of the same high quality as the Viskalt Roofing Compound previously described but is not as heavy and has more penetrating qualities. It is applied to the concrete at least 12 to 24 hours before the first mopping of Viskalt Roofing Compound.

Container and Label for Viskalt Primer

Besides its use on concrete it is also used to prime walls, chimneys, to act as a binder to which Viskalt Roofing Compound is to be applied for setting flashings, waterproofing, etc.

REX CONSTRUCTION ROOFING

A Viskalt Coated Mineral Surfaced Saturated Felt Roof Finish Used Especially for Steep Roofs

The use of this product, as final finish for built-up steep roofs, such as saw tooth skylights, etc., eliminates entirely the handling of gravel or slag for surfacing, and materially reduces the amount of Viskalt to be heated and applied. 17 in. of the width of the sheet is Viskalt Saturated Felt, Viskalt coated and mineral surfaced, and the other 19 in. of the width of the sheet is bare felt, Viskalt Saturated, provided for the cementing of sheet to sheet in the application. This gives a full double thickness of felt. This roofing is furnished in rolls 36 inches wide, 108 sq. ft., each weighing approximately 55 lb. Sufficient material in each roll to complete one-half square of surface.

Rex Construction Roofing

Available in green, blue-black, and red mineral surfacing. Can also be furnished with chrome yellow and other colored surfacings at a small additional cost. Especially recommended for airport construction.

RICHARDSON SPECIAL CAP OR BASE SHEET

For Use Over Wood Decks Under Slate or Tile Roofing and for Temporary Coverings

The use of this product eliminates the use of a 30-lb. saturated felt in built-up roof construction, and insures a better base sheet construction. This product is manufactured with a backing of bare saturated felt, the other side coated and surfaced with talc. Furnished in rolls 36 in. wide, 216 sq. ft. each weighing approximately 68 lb.

The Identifying Label

Richardson Special Base Sheet is recommended for use in the construction of built-up roofs for application over wood surfaces, for use under slate and tile roofing and for temporary roof coverings. The talc undersurface prevents it from adhering to wood roofs and eliminates the use of roofing paper. The Base Sheet is nailed to the roof, strips lapping 2 ins.

RICHARDSON FELT, VISKALT SATURATED

30-lb. and 15-lb. Felts Regularly Used in Richardson Built-up Roofing

This is the very best type of felt in both material and manufacture for use in built-up roofing. The felt is also supersaturated in Viskalt, our very best quality of asphalt waterproofing and on account of the superior quality of the Viskalt long life is assured to the felt.

The Identifying Label

The two weights and their different uses are fully described under the various following built-up roof specifications. They carry Certificate of Quality and Underwriters' Label.

The rolls weigh approximately 60 lb. per roll.

POURED CONCRETE OR GYPSUM DECKS

20-year Roof—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

SUPER-VISKALT BUILT-UP ROOF—SPECIFICATION A-1-C

Description of Materials

Primer—The priming coat shall be Viskalt Concrete Primer.

Felt—The five layers of felt shall be Richardson Felt, Viskalt Saturated, weighing about 15 lb. per 108 sq. ft.

Bitumen—The Bitumen shall be Viskalt Roofing Compound delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., uniformly mopped. For each mopping, use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The concrete shall be swept clean and free from all debris. All rough spots shall be smoothed, and all low spots filled to insure proper bond.

Second—A thorough coating of Viskalt Concrete Primer shall be applied and sufficient time (12 to 24 hours) given for it to thoroughly penetrate.

Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

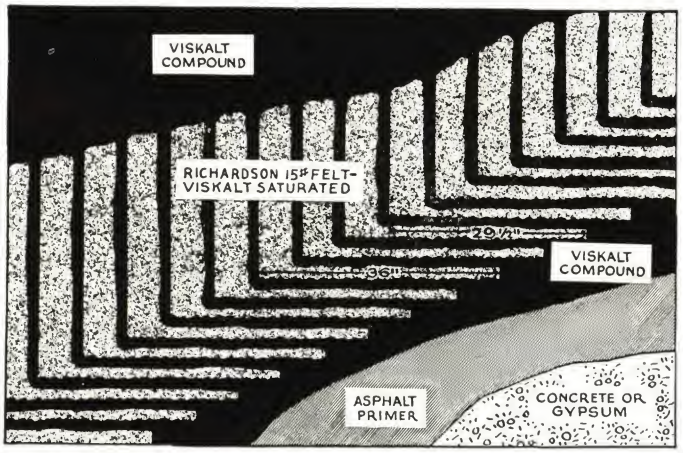
Fourth—Embed in the hot Viskalt Roofing Compound five layers of Richardson Felt, Viskalt Saturated, lapping each layer 29½ in. over the preceding layer, mopping between the laps a heavy coating of Viskalt Roofing Compound so that in no case shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Fifth—Thoroughly mop the entire surface with a heavy and final coating of Viskalt Roofing Compound, forming a complete homogeneous mass.

Flashings, Flanges, etc.

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connecting to roofing shall be set in hot Viskalt Roofing Compound on top of at least five plies of felt nailed and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.



Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutter by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surface as outlined for final coating.

Note: The above specification is adaptable for decks constructed of cement tile, book tile, precast gypsum slabs and similar monolithic construction. In case of poured and precast gypsum, all felts shall be securely nailed along the back of each sheet as a precautionary measure to insure satisfactory results. When poured concrete, cement tile, or book tile is used on surfaces over 2 inches to the foot, proper nailing facilities should be incorporated in the roof deck.

Bill of Materials Per Square

Concrete Primer (1 gal.)	9 lb.
Six moppings Viskalt Roofing Compound (18 gal.)	162 lb.
Five layers Richardson 15-lb. Felt, Viskalt Saturated	75 lb.
Weight of Completed Roof	246 lb.

Bond

If a Richardson Twenty-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector who shall cut the roof as he considers necessary. Such bonds will be given only when the roof is laid by an approved Richardson Franchise Roofer in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification, we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

15-year Roof—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

VISKALT BUILT-UP ROOF—SPECIFICATION B-1-C

Specification B-1-C is the same as Specification A-1-C above, with the following exceptions:

"Felt" paragraph is changed to read "The four layers of felt," etc.

Paragraph **"Fourth"** under **"Method of Construction"** is changed to read, "Embed in the hot Viskalt Roofing Compound four layers of Viskalt Richardson Felt, Viskalt Saturated, lapping each layer 27½ in.," etc.

Fifth line under **"Flashings, Flanges, Etc."** should be changed to ". . . on top of at least four plies of felt . . ." **etc.**

"Bill of Materials Per Square" should be changed to the following:

Concrete Primer (1 gal.)	9 lb.
Five moppings Viskalt Roofing Compound (15 gal.)	135 lb.
Four layers Richardson 15-lb. Felt, Viskalt Saturated	60 lb.
Weight of completed roof	204 lb.

"Bond" will be the same except "Fifteen-Year" will be substituted for "Twenty-Year."

POURED CONCRETE OR GYPSUM DECKS

10-year Roof—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

STANDARD VISKALT BUILT-UP ROOFS—SPECIFICATION C-1-C

Description of Materials

Primer—The priming coat shall be Asphalt Concrete Primer.

Felt—There shall be used three layers of Richardson Felt, Viskalt Saturated, weighing approximately 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound, delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., uniformly mopped. For each mopping use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The concrete slab shall be swept clean and free from all debris. All rough spots shall be smoothed and all low parts properly filled to insure adhesion.

Second—A thorough coating of Asphalt Concrete Primer shall be applied by a brush and sufficient time (12 to 24 hours) given for it to thoroughly penetrate the surface.

Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Fourth—Embed in the hot Viskalt Roofing Compound three layers of Richardson 15 lb. Felt, Viskalt Saturated, lapping each layer 24½ in. over preceding one, mopping between each sheet a thorough coating of Viskalt Roofing Compound, so that in no place shall felt touch felt, and forming a solid and continuous waterproofing membrane.

Fifth—Thoroughly cover the entire surface with a uniform and final coating of Viskalt Roofing Compound, uniformly mopped.

Note: When application is intended over concrete decks where slope exceeds 2 in. to the foot, suitable means for nailing must be provided.

When application is to be over gypsum roof decks application is to be made as over concrete, nailing each sheet in addition thereto 6 in. from the upper edge; nails to be spaced not more than 2 ft. apart and shall not be longer than ⅞ in. and driven through flat tin discs.

Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to the roofing shall be set in hot Viskalt Roofing Compound on top of three plies of felt, nailed and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

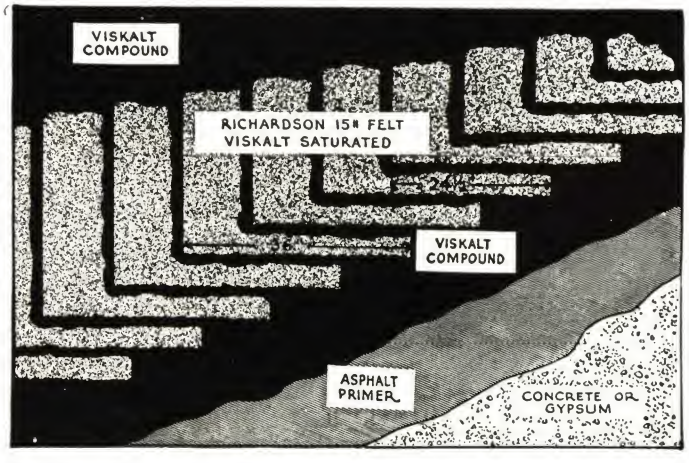
Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surfaces as outlined for final coating.

Bill of Materials Per Square

Three layers Richardson 15 lb. Felt, Viskalt Saturated	45 lb.
Four layers Viskalt Roofing Compound (12 gal.)	108 lb.
One coating Asphalt Concrete Primer (1 gal.)	9 lb.
Weight of completed roof	162 lb.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary. Such bonds will be given only when the roof is applied by a Richardson Franchise Roofer and in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.



Abbreviated Specification—10 year roof.

Roofing to be Richardson Standard Viskalt Roof.

Specification C-1-C—Applied in accordance with manufacturer's complete specifications for use over concrete or gypsum decks.

POURED CONCRETE OR GYPSUM DECKS

20-year Roof—Inclines Up to 6 In. to 1 Ft.—Crushed Slate Surfaced

SUPER-REX CONSTRUCTION BUILT-UP ROOFS—SPECIFICATION A-2-C

Description of Materials

Primer—The priming coat shall be Asphalt Concrete Primer.

Felt—The three layers of felt shall be Richardson Felt, Viskalt Saturated, weighing about 15 lb. per 108 sq. ft.

Cap Sheets—The two layers of cap sheets shall be Rex Construction Roofing, 36 in. wide, of which 17 in. is mineral surfaced and the other 19 in. is bare felt to provide a proper nailing and bonding surface. Weight approximately 100 lb. per 100 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound, delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., and uniformly mopped. For each mopping, use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by overheating.

Method of Construction

First—The concrete shall be swept clean and free from all debris. All rough spots shall be smoothed, and all low spots shall be filled to insure proper bond.

Second—A thorough coating of Asphalt Concrete Primer shall be applied, and sufficient time (12 to 24 hours) given for it to thoroughly penetrate.

Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

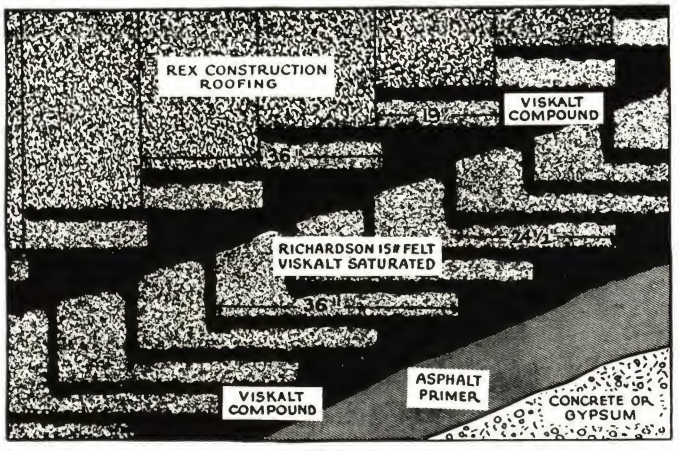
Fourth—Embed in the hot Viskalt Roofing Compound three layers of Richardson 15-lb. Felt, Viskalt Saturated, lapping each layer 24½ in. over the preceding layer, mopping between the laps a heavy coating of Viskalt Roofing Compound, so that in no case shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Fifth—Thoroughly mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Sixth—Embed in the hot Viskalt Roofing Compound at right angles to the eaves and ridges a starting sheet of asphalt felt 19 in. wide cut from the selvage side of the Rex Construction Roofing, this sheet to be securely held in place by nails fastened to nailing strips provided by contractor in roof deck at ridge.

Seventh—Mop the full width of the 19-in. selvage sheet with hot Viskalt Roofing Compound, and while hot lay the first full course, using a full width 36-in. sheet of Rex Construction Roofing, the mineral edge flush with and parallel to the starting line. Roll down securely to insure a positive bond between the felt and the compound. Each sheet of Rex Construction Roofing should be securely anchored by nailing to the strip provided at the ridge, or high point of roof by contractor. When laps are necessary they shall be overlapped at least 6 in. and carefully cemented together.

Eighth—Mop the full width of the 19-in. selvage side with Viskalt Roofing Compound, into which, while hot, embed a second sheet of Rex Construction Roofing, nailing as described and continue with subsequent sheets until roof is completed. Care should be taken not to spill compound on mineral surface of Rex Construction Roofing. This is absolutely essential, as discoloration of the mineral surface destroys the real effect of the roof.



Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to roofing shall be set in hot Viskalt Roofing Compound on top of at least three plies of felt and under the Rex Construction Roofing and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surface as outlined for final coating.

Note: This specification is adaptable for roofs up to 6 in. to the foot and is not recommended for roofs having an incline under 1 in. to the foot. Rex Construction Roofing can be run parallel to the incline of the roof. Furnished in red, green and blue-black Mineral Surfacing.

Bill of Materials Per Square

Asphalt Concrete Primer	9 lb.
Three layers Richardson 15-lb. Felt, Viskalt Saturated	45 lb.
One layer Rex Construction Roofing	100 lb.
Five layers Viskalt Roofing Compound	130 lb.
Weight of complete roof	284 lb.

Bond

If a Richardson Twenty-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary. Such bonds will be given only when the roof is laid by an approved Richardson Franchise Roofer in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification, we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

POURED CONCRETE OR GYPSUM DECKS

10-year Roofs—Inclines Up to 6 In. to 1 Ft.—Crushed Slate Surfaced

STANDARD REX CONSTRUCTION BUILT-UP ROOFS—SPECIFICATION C-2-C

Description of Materials

Primer—The priming coat shall be Asphalt Concrete Primer.

Felts—The felts used shall be Richardson Felt, Viskalt Saturated, weighing approximately 15 lb. per 108 sq. ft.

Cap Sheets—The two layers of cap sheets shall be Rex Construction Roofing 36 in. wide of which 17 in. is mineral surfaced and 19 in. is bare felt, to provide a proper nailing and bonding surface. Weight approximately 100 lb. per 100 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound, delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., uniformly mopped. For each mopping use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The concrete slab shall be swept clean and free from all debris. All rough spots shall be smoothed and all low spots properly filled to insure adhesion. It shall be properly graded to all outlets.

Second—A thorough coating of Asphalt Concrete Primer shall be applied by a brush and sufficient time (12 to 24 hours) given for it to thoroughly penetrate the surface.

Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Fourth—Embed in the hot Viskalt Roofing Compound two layers of Richardson 15-lb. Felt, Viskalt Saturated, lapping each sheet 19 in. over preceding one, mopping between laps a thorough coating of Viskalt Roofing Compound, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Fifth—Thoroughly mop the entire surface with a heavy and uniform mopping of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

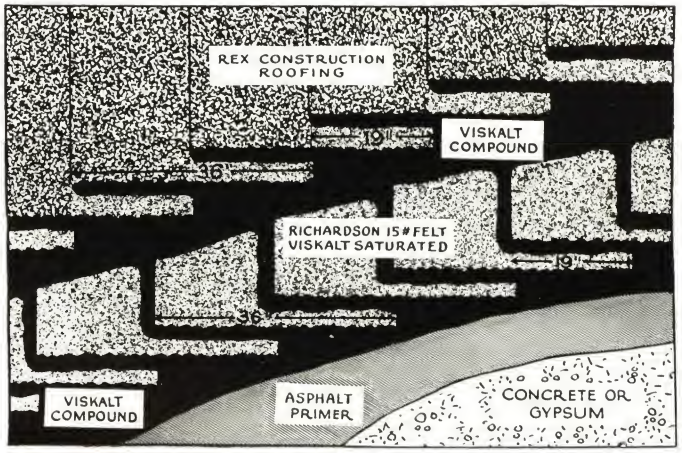
Sixth—A starting sheet of Asphalt Felt 19 in. wide, cut from the selvage side of the Rex Construction Roofing, shall be laid in the hot Viskalt Roofing Compound, securely held in place by nails used as often as necessary.

Seventh—Mop the full width of the 19-in. starting sheet with hot Viskalt Roofing Compound, and, while hot, lay the first full course, using a full width 36-in. sheet of Rex Construction Roofing, the mineral-surfaced edge flush with and parallel to the starting line. Each sheet of Rex Construction Roofing shall be securely fastened by staggering nails along the selvage side of the sheet. Nails should be spaced from 8 to 12 in., depending upon the incline of the roof. Where end laps are necessary, they shall be overlapped 6 in. and throughly cemented together.

Eighth—Mop the full width of the 19-in. selvage side with Viskalt Roofing Compound, into which, while hot, embed a second sheet of Rex Construction Roofing, nailing as described and continue with subsequent sheets until roof is completed. Care should be taken not to spill compound on mineral surface of Rex Construction Roofing. This is absolutely essential, as discoloration of the mineral surface destroys the real effect of the roof.

Note: When application is intended over Concrete Decks where slope exceeds 2 in. to the foot, suitable means for nailing must be provided.

When application is to be over Gypsum Roof Decks, application is to be made as over concrete, nailing each sheet in addition thereto 6 in. from the upper edge; nails to be spaced not more than 2 ft. apart.



Flashings, Flanges, etc.

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to the roofing shall be set in hot Viskalt Roofing Compound on top of the three plies of felt, nailed and double felt stripped; felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surfaces as outlined for final coating.

Note: This specification is adaptable for roofs up to 6 in. to the foot, and is not recommended for roofs having an incline under 1 in. to the foot. Rex Construction Roofing can be run parallel to the incline of the roof. Furnished in red, green and blue-black Mineral Surfacing.

Bill of Materials Per Square

Two layers Richardson 15-lb. Felt, Viskalt Saturated	30 lb.
One coat Asphalt Concrete Primer	9 lb.
Four layers Viskalt Roofing Compound (12 gal.)	108 lb.
One layer Rex Construction Roofing (2 rolls)	100 lb.
Weight of completed roof	247 lb.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he deems necessary. Such bonds will be given only when the roof is laid by a Richardson Franchise Roofer, and in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

POURED CONCRETE OR GYPSUM DECKS

20-year Roof—Inclines Not Exceeding 3 In. to 1 Ft.—Slag or Gravel Surfaced

SUPER-RICHARDSON BUILT-UP ROOFS—SPECIFICATION A-3-C

Description of Materials

Primer—The priming coat shall be Asphalt Concrete Primer.

Felt—The four layers of felt shall be Richardson Felt, Viskalt Saturated, weighing about 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Richardson Flex-A-Tile Asphalt, heated to a temperature of not over 360° F., uniformly mopped. For each mopping use 30 lb. per 100 sq. ft.

Surfacing Material—The surfacing material shall be gravel or slag. 400 lb. of gravel or 300 lb. of slag, from ¼ to ⅝ in. in size shall be used for each 100 sq. ft. of surfacing. It shall be dry and free from dirt.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by overheating.

Method of Construction

First—The concrete shall be swept clean and free from all debris. All rough spots shall be smoothed and all low spots filled to insure proper bond.

Second—A thorough coating of Asphalt Concrete Primer shall be applied and sufficient time (12 to 24 hours) given for it to thoroughly penetrate.

Third—Over the primed surface, apply a thorough coating of hot Richardson Flex-A-Tile Asphalt, using approximately 40 lb. per 100 sq. ft.

Fourth—Embed in the hot Richardson Flex-A-Tile Asphalt four layers of Richardson 15-lb. Felt, Viskalt Saturated, lapping each layer 27½ in. over the preceding layer, mopping between the laps a heavy coating of Richardson Flex-A-Tile Asphalt, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Fifth—Pour from a dipper a uniform coating of Richardson Flex-A-Tile Asphalt, using approximately 50 lb. per 100 sq. ft., into which, while hot, embed 400 lb. of gravel or 300 lb. of slag.

Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings or edgings which are connected with the roofing shall be set in hot Richardson Flex-A-Tile Asphalt on top of at least four plies of felt, nailed and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Richardson Flex-A-Tile Asphalt.

Waterproofing Walls

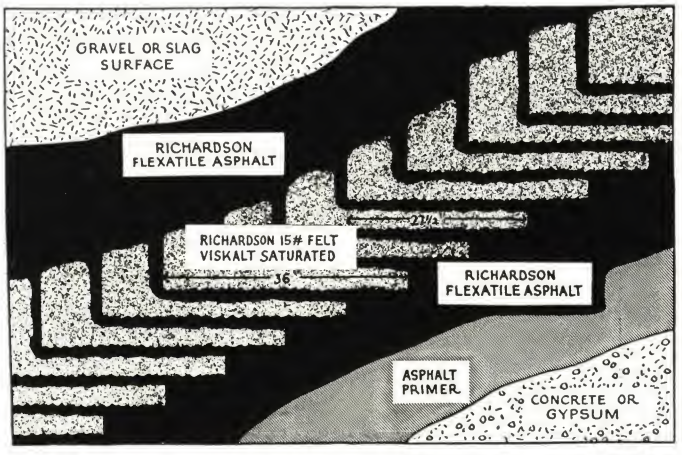
All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Richardson Flex-A-Tile Asphalt.

Valleys and Gutters

Reinforce all valleys and gutters by use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surface as outlined for final coating.

Bill of Materials Per Square

Asphalt Concrete Primer	9 lb.
Four layers Richardson 15-lb. Felt, Viskalt Saturated	60 lb.
Five layers Richardson Flex-A-Tile Asphalt	180 lb.
Gravel	400 lb.
Weight of completed roof	649 lb.



Bond

If a Richardson Twenty-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary, such cuts to be made before the gravel or slag is applied. Such bonds will be given only when the roof is laid by an approved Richardson Franchise Roofer in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification, we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

15-year Roof—Inclines Not Exceeding 3 In. to 1 Ft.—Slag or Gravel Surfaced

MEDIUM-RICHARDSON BUILT-UP ROOFS—SPECIFICATION B-3-C

Specification B-3-C is the same as A-3-C with the following exceptions:

The paragraph **"Felt"** should be changed to read:

"There shall be used one layer of Richardson Felt, Viskalt Saturated, weighing not less than 30 lb. per 108 sq. ft., and two layers of Richardson Felt, Viskalt Saturated, weighing not less than 15 lb. per 108 sq. ft."

Under **"Method of Construction"** insert in place of the **"Fourth"** paragraph the following:

"*Fourth*—Cover the entire surface with a layer of Richardson 30-lb. Felt, Viskalt Saturated, lapping each sheet not less than 2 in. over the preceding sheet."

Add a new fifth and sixth paragraph as follows, and change the fifth paragraph to seven.

"*Fifth*—Mop the entire surface with a uniform and thorough coating of Richardson Flex-A-Tile Asphalt, using approximately 30 lb. per 100 sq. ft.

"*Sixth*—Embed into the hot Richardson Flex-A-Tile Asphalt two layers of Richardson 15-lb. Felt, Viskalt Saturated, lapping each layer 17 in. over the preceding layer, mopping between the laps a heavy coating of Richardson Flex-A-Tile Asphalt, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane."

Change the eighth line under the heading **"Base and Counter Flashings"** to read " . . . on top of at least three plies of felt . . ."

"Bill of Materials Per Square" should be changed to:

Asphalt Concrete Primer	9 lbs.
One layer Richardson 30-lb. Felt, Viskalt Saturated	30 lb.
Two layers Richardson 15-lb. Felt, Viskalt Saturated	30 lb.
Four layers Richardson Flex-A-Tile Asphalt	140 lb.
Gravel	400 lb.
Weight of completed roof	609 lb.

"Bond" will be the same except "Fifteen-year" will be substituted for "Twenty-year."

POURED CONCRETE OR GYPSUM DECKS

10-year Roofs—Inclines Not Exceediing 3 In. to 1 Ft.—Gravel or Slag Surfaced

STANDARD RICHARDSON BUILT-UP ROOFS—SPECIFICATION C-3-C

Description of Materials

Primer—The priming coat shall be Asphalt Concrete Primer.

Felt—There shall be used three layers of Richardson Felt, Viskalt Saturated, weighing approximately 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Richardson Flex-A-Tile Asphalt, heated to a temperature of not more than 360° F., uniformly mopped. For each mopping use approximately 30 lb. per 100 sq. ft.

Surfacing Material—The surfacing material shall be slag or gravel. 400 lb. of gravel or 300 lb. of slag, from ¼ to ⅝ in. in size, shall be used for each 100 sq. ft. of surfacing. It shall be dry and free from dirt.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The deck must be swept clean and free from all debris. It shall be dry, firm and clean, free from all rough and low spots and properly graded to the outlets.

Second—A thorough coating of Asphalt Concrete Primer shall be applied by a brush and sufficient time (12 to 24 hours) given for it to thoroughly penetrate the surface.

Third—Mop the entire surface with a uniform and thorough coating of Flex-A-Tile Asphalt, using approximately 40 lb. per 100 sq. ft.

Fourth—Embed in the hot Flex-A-Tile Asphalt three layers of Richardson 15 lb. Felt, Viskalt Saturated, lapping each sheet 24½ in. over the preceding one, mopping between each layer a thorough coating of Flex-A-Tile Asphalt, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Pour from a dipper a uniform coating of hot Flex-A-Tile Asphalt, using approximately 50 lb. per 100 sq. ft., into which, while hot, embed 400 lb. of gravel or 300 lb. of slag per square, uniformly spread and broomed.

Note: When application is intended over concrete decks where slope exceeds 2 inches to the foot, suitable means for nailing must be provided.

When application is to be over gypsum roof decks application is to be made as over concrete, nailing each sheet in addition thereto 6 in. from the upper edge; nails to be spaced not more than 2 ft. apart and shall not be longer than ⅞ in. and driven through flat tin discs.

Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to the roofing shall be set in hot Flex-A-Tile Asphalt on top of the three plies, securely fastened and double felt stripped, the felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Richardson Flex-A-Tile Asphalt.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Richardson Flex-A-Tile Asphalt.

Valleys and Gutters

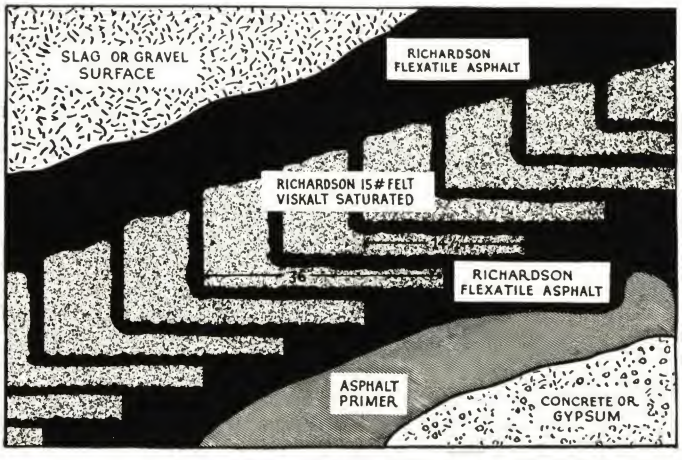
Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surfaces as outlined for final coating.

Bill of Materials Per Square

Three layers Richardson 15 lb. Felt, Viskalt Saturated	45 lb.
One coating Viskalt Concrete Primer (1 gal.)	9 lb.
Flex-A-Tile Asphalt	150 lb.
Gravel	400 lb.
Weight of completed roof	604 lb.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he deems necessary. Such cuts shall be made prior to embedding of surfacing material. Such bonds will be given only when the roof is applied by a Richardson Franchise Roofer, and in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.



Abbreviated Specifications 10-year Roof—Roofing to be Standard Richardson Built-up Roof.

Specification C-3-C—Applied in strict accordance with manufacturer's complete specifications. For use over concrete or gypsum deck.

POURED CONCRETE OR GYPSUM DECKS

10-year Roofs—Inclines Up to 3 In. to 1 Ft.—Viskalt Smooth Surfaced

STANDARD VISKALT BUILT-UP ROOFS—SPECIFICATION C-1A-C

Description of Materials

Primer—The priming coat shall be Asphalt Concrete Primer.

Felt—There shall be used one layer of Richardson Felt, Viskalt Saturated, weighing not less than 30 lb. per 108 sq. ft., and two layers of Richardson Felt, Viskalt Saturated, weighing not less than 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound heated to a temperature or not more than 375° F., uniformly mopped. For each mopping use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The concrete slab shall be swept clean and free from all debris. All rough spots shall be smoothed and all low parts properly filled to insure adhesion.

Second—A thorough coating of Viskalt Concrete Primer shall be applied by a brush and sufficient time (12 to 24 hours) given for it to thoroughly penetrate the surface.

Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Fourth—Embed in the hot Viskalt Roofing Compound one layer of Richardson 30 lb. Felt, Viskalt Saturated, lapping each sheet 2 in. over preceding one.

Fifth—Mop the surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Sixth—Embed in the hot Viskalt Roofing Compound two layers of Richardson 15 lb. Felt, Viskalt Saturated, lapping each sheet 19 in. over preceding one, mopping between the sheets a heavy coating of Viskalt Roofing Compound, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Seventh—Thoroughly mop the entire surface with a uniform coating of Viskalt Roofing Compound, forming a complete homogeneous mass.

Flashings, Flanges, etc.

All flashings shall be constructed in accordance with Richardson Special Specifications.

All metal flanges, flashings and edgings which are connected to the roofing shall be set in hot Viskalt Roofing Compound on top of at least four plies of felt, nailed and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surface as outlined for final coating.

Note: The above specification is adaptable for decks constructed of cement tile, book tile, precast gypsum slabs and similar monolithic construction. In case of poured and precast gypsum, all felts shall be securely nailed along the back of each sheet as a precautionary measure to insure satisfactory results. When poured concrete, cement tile or book tile is used on surfaces over two (2) in. to the foot, proper nailing facilities should be incorporated in the roof deck.

Bill of Materials Per Square

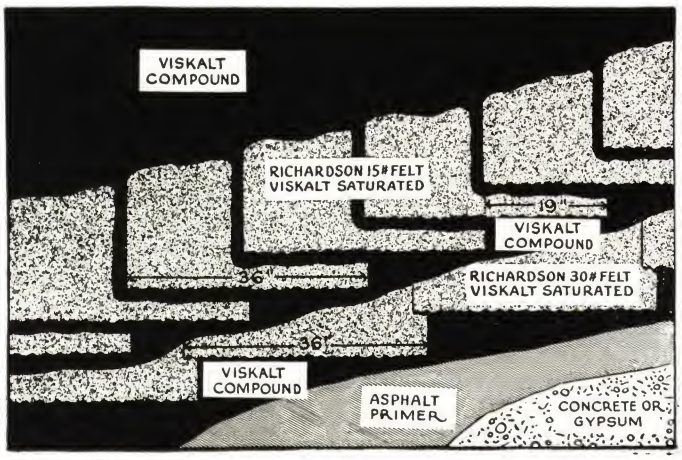
One gallon Viskalt Concrete Primer	9 lb.
One layer Richardson 30 lb. Felt, Viskalt Saturated	30 lb.
Two layers Richardson 15 lb. Felt, Viskalt Saturated	30 lb.
Twelve gallons Viskalt Roofing Compound	108 lb.
Weight of completed roof	177 lb.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary. These cuts to be made before the gravel or slag is applied. Such bonds shall be given only when the roof is laid by an approved Richardson Franchise Roofer and in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof for a period of ten years.

Note: This specification particularly adapted to winter laying, where weather conditions do not permit entire completion of roof, but is essential to thoroughly waterproof the deck to permit completion of interior construction.

Simply apply the 30-lb. base sheet and thoroughly mop. Complete the roof when weather conditions permit.



WOOD DECKS

20-year Roof—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

SUPER-VISKALT BUILT-UP ROOFS—SPECIFICATION A-1-W

Description of Materials

Base Sheet—The base sheet shall be Richardson Special Base Sheet weighing about 34 lb. per square.

Felt—The four layers of felt shall be Richardson Felt, Viskalt Saturated, weighing over 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound, delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., uniformly mopped.

For each mopping use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The deck must be swept clean and free from debris. It will be constructed of seasoned lumber free from knot holes, large cracks and loose boards.

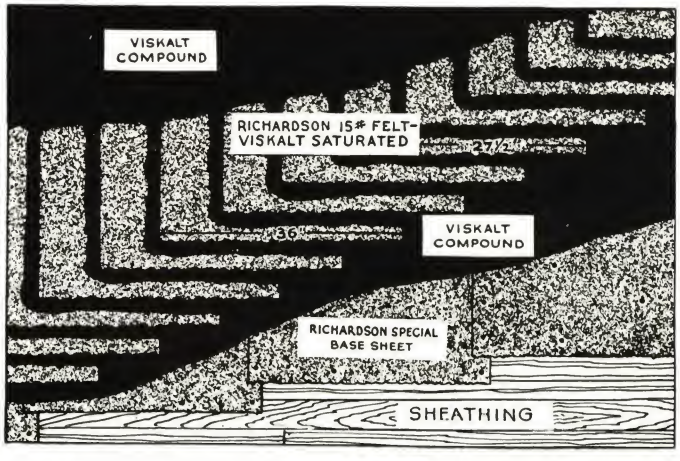
The roof shall be properly graded to the outlets.

Second—Cover the entire surface with a layer of Richardson Special Base Sheet, lapping each sheet not less than 2 in. over the preceding sheet, nailing over 6 in. along the laps and staggering nails 11 in. apart down the center of the sheet. Care must be taken to see that the nails are solidly seated, and not driven between the boards. The base sheet should be unwound and laid with a finished surface next to the wood deck.

Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Fourth—Embed in the hot Viskalt Roofing Compound four layers of Richardson Felt, Viskalt Saturated, lapping each layer 24½ in. over the preceding layer, mopping between the laps a heavy coating of Viskalt Roofing Compound, thus forming a solid and continuous waterproofing membrane.

Fifth—Thoroughly mop the entire surface with a uniform coating of Viskalt Roofing Compound, forming a complete homogeneous mass.



Flashings, Flanges, etc.

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to roofing shall be set in hot Viskalt Roofing Compound on top of at least five plies of felt, nailed and double felt stripped; felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surfaces as outlined for final coating.

Bill of Materials Per Square

One layer Richardson Special Base Sheet	34 lb.
Four layers 15-lb. Richardson Felt, Viskalt Saturated	60 lb.
Five layers Viskalt Roofing Compound (15 gal.)	135 lb.
Weight of completed roof	229 lb.

Bond

If a Richardson Twenty-year Guaranty Bond is required, roof shall be inspected by an authorized Richardson Inspector who shall cut the roof as he considers necessary. Such bonds shall be given only when the roof is laid by an approved Richardson Franchise Roofer in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification, we will issue a flashing endorsement covering that part of the roof construction for a period of 10 years.

15-year Roof—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

VISKALT BUILT-UP ROOFS—SPECIFICATION B-1-W

Specification B-1-W is the same as A-1-W with the following exceptions:

The paragraph **"Felt"** should be changed to read, "The three layers of felt, etc."

Under **"Methods of Construction"** the first line in the paragraph **"Fourth"** should be changed to, "Embed in the hot Viskalt Roofing Compound three layers of Richardson Felt, Viskalt Saturated, lapping each layer 22½ in.," etc.

The fifth line under **"Flashings, Flanges, Etc."** should be changed to read "...on top of at least four plies of felt..."

For the **"Bill of Materials Per Square"** substitute the following:

One layer Richardson Special Base Sheet	34 lb.
Three layers 15-lb. Richardson Felt, Viskalt Saturated	45 lb.
Four layers Viskalt Roofing Compound (12 gal.)	108 lb.
Weight of completed roof	187 lb.

"Bond" will be the same except "Fifteen-year" will be substituted for "Twenty-year."

WOOD DECKS

10-year Roofs—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

STANDARD VISKALT BUILT-UP ROOFS—SPECIFICATION C-1-W

Description of Materials

Felt—There shall be used one layer of Richardson Felt, Viskalt Saturated, weighing not less than 30 lb. per 108 sq. ft., and two layers of Richardson Felt, Viskalt Saturated, weighing not less than 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound, delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., uniformly mopped. For each mopping use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The deck must be swept clean and free from all debris. It shall be constructed of seasoned lumber free from knot holes, large cracks and loose boards. The roof shall be properly graded to the outlets.

Second—Cover the entire surface with a layer of Richardson 30-lb. Felt, Viskalt Saturated, lapping each sheet not less than 2 in. over preceding sheet, nailing every 6 in. along the laps, and staggering nails 11 in. apart down the center of the sheet. Care must be taken to see that the nails are solidly seated and not driven between the boards.

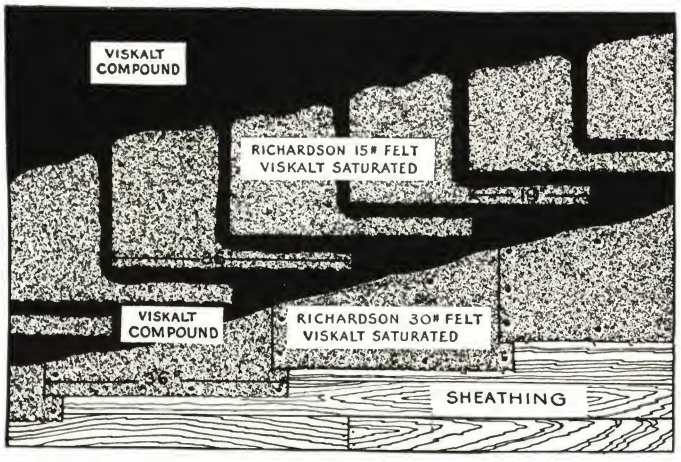
Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Fourth—Embed in the hot Viskalt Roofing Compound two layers of Richardson 15-lb. Felt, Viskalt Saturated, lapping each sheet 19 in. over the preceding one, mopping between the sheets a heavy coating of Viskalt Roofing Compound, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Fifth—Thoroughly mop the entire surface with a uniform coating of Viskalt Roofing Compound, forming a complete homogeneous mass.

Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.



All metal flanges, flashings and edgings which are connected to the roofing shall bet set in hot Viskalt Roofing Compound on top of at least four plies of felt nailed and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surface as outlined for final coating.

Bill of Materials Per Square

One layer Richardson 30-lb. Felt, Viskalt Saturated	30 lb.
Two layers Richardson 15-lb. Felt, Viskalt Saturated	30 lb.
Three layers Viskalt Roofing Compound (9 gal.)	81 lb.
Weight of completed roof	141 lb.

Bond

If a Richardson Ten-year Guaranty Bond is required, roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary. Such bonds shall be given only when the roof is laid by an approved Richardson Franchise Roofer in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

5-year Roofs—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

MEDIUM VISKALT BUILT-UP ROOFS—SPECIFICATION D-1-W

Specification D-1-W is the same as Specification C-1-W with the following exceptions:

The paragraph **"Felt"** is preceded by a paragraph titled **"Base Sheet"** which reads as follows: "The Base Sheet shall be a Richardson Special Base Sheet weighing approximately 34 lb. per square."

The paragraph **"Felt"** shall be changed to read: "The Felt shall be Richardson Felt, Viskalt Saturated, weighing not less than 15 lb. per 108 sq. ft."

Under **"Method of Construction,"** the second paragraph should read: "Cover the entire surface with one layer of Richardson Special Base Sheet, lapping not less than 2 in., etc."

The paragraph **"Fourth"** should be changed to read: "Embed in the hot Viskalt Roofing Compound a layer of Richardson Felt, Viskalt Saturated, lapping it not less than 3 in."

The seventh line under **"Base and Counter Flashing"** should be changed to read: "on top of at least two plies of felt."

Change **"Bill of Materials"** to the following:

One layer of Richardson Special Base Sheet	34 lb.
One layer Richardson Felt, Viskalt Saturated	15 lb.
Two layers Viskalt Roofing Compound (6 gal.)	54 lb.
Weight of completed roof	103 lb.

WOOD DECKS

20-year Roofs—Inclines Up to 6 In. to 1 Ft.—Crushed Slate Surfaced

SUPER-REX CONSTRUCTION BUILT-UP ROOFS—SPECIFICATION A-2-W

Description of Materials

Base Sheet—The base sheet shall be Richardson Special Base Sheet, weighing about 34 lb. per square.

Felt—The two layers of felt shall be Richardson Felt, Viskalt Saturated, weighing about 15 lb. per 108 sq. ft.

Cap Sheets—The two layers of cap sheets shall be Rex Construction Roofing 36 in. wide, of which 17 in. is mineral surfaced and the other 19 in. is bare felt, to provide a proper nailing and bonding surface. Weight approximately 100 lb. per 100 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound, delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., uniformly mopped. For each mopping use 3 gal. (approximately 30 lb.) per 100 sq. ft.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The deck must be swept clean and free of all debris. It shall be constructed of seasoned lumber, free from knot holes, large cracks and loose boards. The roof deck shall be properly graded to the outlets.

Second—Cover the entire surface with a layer of Richardson Special Base Sheet, lapping each sheet not less than 2 in. over the preceding sheet, nailing every 6 in. along the laps, and staggering nails 11 in. apart down the center of the sheet. Care must be taken to see that the nails are solidly seated and not driven between the boards. The Base Sheet should be unwound and laid with a finished surface next to the wood deck.

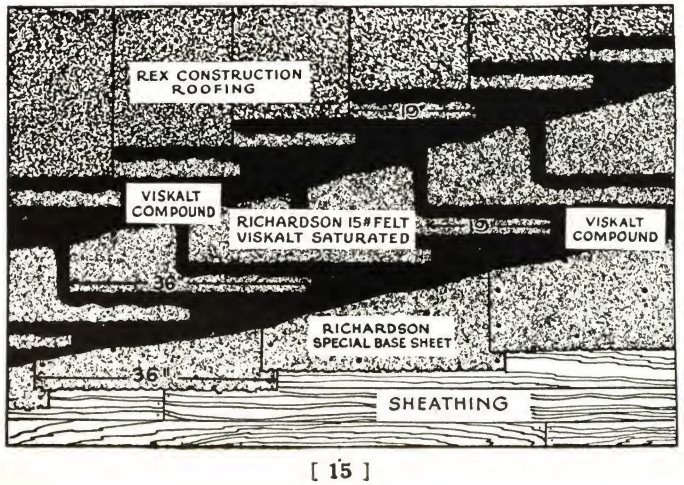
Third—Mop the entire surface with a uniform and thorough coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Fourth—Embed in the hot Viskalt Roofing Compound two layers of Richardson 15-lb. Felt, Viskalt Saturated, lapping each sheet 19 in. over the preceding layer, mopping between the laps a heavy coating of Viskalt Roofing Compound, thus forming a solid and continuous waterproofing membrane.

Fifth—Thoroughly mop the entire surface with a heavy and uniform mopping of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Sixth—A starting sheet of Asphalt Felt 19 in. wide, cut from the selvage side of the Rex Construction Roofing, shall be laid in a mopping of Viskalt Roofing Compound, this sheet to be securely held in place by nails used as often as necessary.

Seventh—Mop the full width of the 19-in. starting sheet with hot Viskalt Roofing Compound, and while hot lay the first full course, using a full width 36-in. sheet of Rex Construction Roofing, the mineral surfaced edge flush with and parallel to the starting line. Each sheet of Rex Construction Roofing shall be securely fastened by staggering nails along the selvage side of the sheet. Nails should be spaced from 8 in. to 12 in., depending upon the incline of the roof. Where end laps are necessary, they shall be overlapped 6 in. and thoroughly nailed and cemented together.



Eighth—Mop the full width of the 19-in. selvage side with Viskalt Roofing Compound, into which, while hot, embed a second sheet of Rex Construction Roofing, nailing as described and continue with subsequent sheets until roof is completed. Care should be taken not to spill compound on mineral surface of Rex Construction Roofing. This is absolutely essential, as discoloration of the mineral surface destroys the real effect of the roof.

Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to roofing shall be set in hot Viskalt Roofing Compound under Rex Construction Roofing and on top of two plies of felt, nailed and double felt stripped, the felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Asphalt Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutters by use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surfaces as outlined for final coating.

Note: This specification is adaptable for roofs up to 6 in. to 1 ft.; not recommended for roofs having an incline under 1 in. to 1 ft. On sloping roofs, Rex Construction Roofing can be run parallel with the incline of the roof.

Bill of Materials Per Square

One layer Richardson Special Base Sheet	34 lb.
Two layers Richardson 15-lb. Felt, Viskalt Saturated	30 lb.
Four layers Viskalt Roofing Compound (12 gal.)	108 lb.
One layer Rex Construction Roofing (2 rolls)	100 lb.
Weight of completed roof	272 lb.

Bond

If a Richardson Twenty-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector who shall cut the roof as he considers necessary. Such bonds will be given only when the roof is laid by an approved Richardson Franchise Roofer in strict accordance with the above specification.

If Richardson Special Flashing Construction is used in conjunction with this specification we will issue flashing endorsement covering that part of the roof construction for a period of ten years.

WOOD DECKS

10-year Roofs—Inclines Up to 6 In. to 1 Ft.—Crushed Slate Surfaced

STANDARD REX CONSTRUCTION BUILT-UP ROOFS—SPECIFICATION C-2-W

Description of Materials

Base Sheet—The base sheet shall be K-B Sheathing Paper —40 lb. per 500 sq. ft.

Felt—The two layers of felt shall be Richardson Felt, Viskalt Saturated, weighing approximately 15 lb. per 108 sq. ft.

Cap Sheets—The two layers of cap sheets shall be Rex Construction Roofing 36 in. wide, of which 17 in. is mineral surfaced and 19 in. is bare felt, to provide proper bonding surface. Weight approximately 100 lb. per 100 sq. ft.

Bitumen—The bitumen shall be Viskalt Roofing Compound, delivered to the job in the manufacturer's original container, heated to a temperature of not more than 375° F., uniformly mopped.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First—The deck must be swept clean and free from all debris. It shall be constructed of seasoned lumber, free from knot holes, large cracks and loose boards. The roof shall be properly graded to the outlets.

Second—Cover the entire surface with a layer of K-B Sheathing Paper, lapping each sheet 2 in. over preceding one and securely nailing at laps.

Third—Cover the entire surface with two layers of Richardson 15-lb. Felt, Viskalt Saturated, lapping each sheet 19 in. over preceding layer, securely nailing the back of each sheet every 6 in., 2 in. from the edge of the sheet.

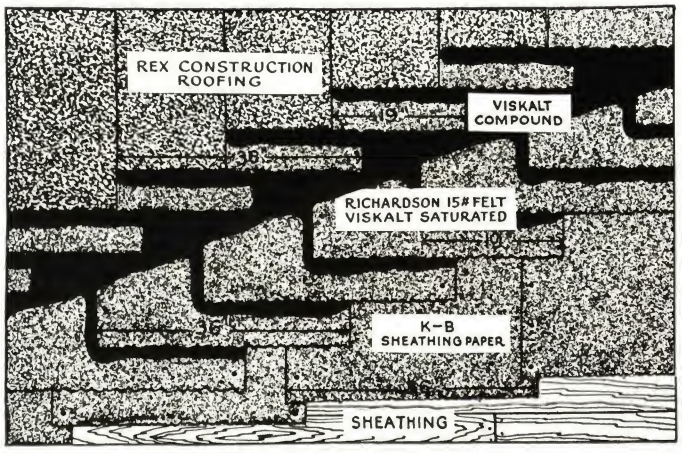
Fourth—Mop each 19-in. lap with a uniform coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Fifth—Mop over the entire surface a uniform coating of Viskalt Roofing Compound, using 3 gal. (approximately 30 lb.) per 100 sq. ft.

Sixth—A starting sheet of Asphalt Felt 19 in. wide, cut from the selvage side of the Rex Construction Roofing, shall be laid in a mopping of Viskalt Roofing Compound, this sheet to be securely held in place by nails used as often as necessary.

Seventh—Mop the full width of the 19-in. starting sheet with hot Viskalt Roofing Compound and, while hot, lay the first full course, using a full width of 36-in. sheet of Rex Construction Roofing, the mineral surfaced edge flush with and parallel to the starting line. Each sheet shall be securely fastened by staggering nails along the selvage side of the sheet. Nails should be spaced from 8 to 12 in. apart, depending upon the incline of the roof. Where end laps are necessary, they shall be overlapped 6 in. and thoroughly nailed and cemented together.

Eighth—Mop the full width of the 19-in. selvage side with Viskalt Roofing Compound, into which, while hot, embed a second sheet of Rex Construction Roofing, nailing as described and continue with subsequent sheets until roof is completed. Care should be taken not to spill compound on mineral surface of Rex Construction Roofing. This is absolutely essential, as discoloration of the mineral surface destroys the real effect of the roof.



Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to roofing shall be set in hot Viskalt Roofing Compound under Rex Construction Roofing, and on top of two plies of felt, nailed and double felt stripped, the felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with hot Viskalt Roofing Compound.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Viskalt Roofing Compound.

Valleys and Gutters

Reinforce all valleys and gutters by the use of an additional layer of Richardson Certified Felt, Viskalt Saturated, to be applied before Rex Construction Roofing.

Note: This specification is adaptable for roofs up to 6 in. to 1 ft., and not recommended for roofs having an incline under 1 in. to 1 ft. On sloping roofs, Rex Construction can be run parallel with the incline of the roof.

Bill of Materials Per Square

One layer K-B Sheathing Paper	8 lb.
Two layers Richardson 15-lb. Felt, Viskalt Saturated	30 lb.
Three layers Viskalt Roofing Compound (9 gal.)	81 lb.
One layer Rex Construction Roofing (2 rolls)	100 lb.
Weight of completed roof	219 lb.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary. Such bonds will be given only when the roof is applied by a Richardson Franchise Roofer in strict accordance with the above specification.

If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

WOOD DECKS

20-year Roofs—Inclines Up to 3 In. to 1 Ft.—Crushed Slate Surfaced

SUPER-RICHARDSON BUILT-UP ROOFS—SPECIFICATION A-3-W

Description of Materials

Felt—There shall be used one layer of Richardson Felt, Viskalt Saturated, weighing not less than 30 lb. per 108 sq. ft. and three layers of Richardson Felt, Viskalt Saturated, weighing not less than 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Richardson Flex-A-Tile Asphalt heated to a temperature of not over 360° F., uniformly mopped. For each mopping use 30 lb. per 100 sq. ft.

Surfacing Material—The surfacing material shall be gravel or slag. 400 lb. of gravel or 300 lb. of slag from ¼ to ⅝ in. inside shall be used for each 100 sq. ft. of surfacing. It shall be dry and free from dirt.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

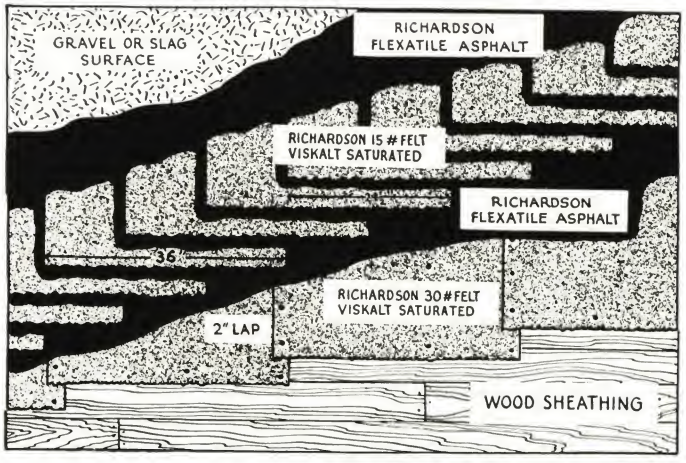
First—The deck must be swept clean and free from all debris. It shall be constructed of seasoned lumber, free from knot holes, large cracks and loose boards. The roof deck shall be properly graded to the outlets.

Second—Cover the entire surface with a layer of Richardson 30 lb. Felt, Viskalt Saturated, lapping each sheet not less than 2 in. over the preceding sheet, nailing every 6 in. along the laps, and staggering nails 11 in. apart down the center of the sheet. Care must be taken to see that the nails are solidly seated and not driven between the boards.

Third—Mop the entire surface with a uniform and thorough coating of Richardson Flex-A-Tile Asphalt, using approximately 30 lb. per 100 sq. ft.

Fourth—Embed into the hot Richardson Flex-A-Tile Asphalt three layers of Richardson 15 lb. Felt, Viskalt Saturated, lapping each layer 24½ in. over the preceding layer, mopping between the laps a heavy coating of Richardson Flex-A-Tile Asphalt, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Fifth—Pour from a dipper a uniform coating of Richardson Flex-A-Tile Asphalt, using approximately 50 lb. per 100 sq. ft., into which, while hot, embed 400 lb. of gravel or 300 lb. of slag.



Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to roofing shall be set in hot Richardson Flex-A-Tile Asphalt on top of at least four plies of felt, nailed and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Richardson Flex-A-Tile Asphalt.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Richardson Flex-A-Tile Asphalt.

Valleys and Gutters

Reinforce all valleys and gutters by the use of an additional layer of Richardson Felt, Viskalt Saturated, finishing the surfaces outlined for final coating.

Bill of Materials Per Square

One layer Richardson 30 lb. Felt, Viskalt Saturated	30 lb.
Three layers Richardson 15 lb. Felt, Viskalt Saturated	45 lb.
Four layers Richardson Flex-A-Tile Asphalt	140 lb.
Gravel	400 lb.
Weight of completed roof	615 lb.

Bond

If a Richardson Twenty-year Guaranty Bond is required the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary. Such cuts shall be made before any gravel or slag is applied. Such bonds will be given only when the roof is applied by an approved Richardson Franchise Roofer in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

15-year Roofs—Inclines Not Over 4 In. to 1 Ft.—Gravel or Slag Surfaced

REX CONSTRUCTION BUILT-UP ROOFS—SPECIFICATION B-3-W

Specification B-3-W is the same as Specification A-3-W with the following exceptions:

The paragraph **"Felt"** should be changed to read: "There shall be four layers of Richardson Felt, Viskalt Saturated, weighing not less than 15 lb. per 108 sq. ft.

The paragraph **"Second"** should be changed to read: "Cover the entire surface with a layer of Richardson 15 lb. Felt, etc."

Change **"Bill of Materials Per Square"** to the following:

Four layers Richardson 15 lb. Felt, Viskalt Saturated	60 lb.
Four layers Richardson Flex-A-Tile Asphalt	140 lb.
Gravel	400 lb.
Weight of completed roof	600 lb.

"Bond" will be the same except "Fifteen-year" will be substituted for "Twenty-year."

WOOD DECKS

10-year Roofs—Inclines Not Exceeding 4 In. to 1 Ft.—Gravel or Slag Surfaced

STANDARD RICHARDSON BUILT-UP ROOFS—SPECIFICATION C-3-W

Description of Materials

Felt—There shall be used one layer of Richardson Felt, Viskalt Saturated, weighing not less than 30 lb. per 108 sq. ft., and two layers of Richardson Felt, Viskalt Saturated, weighing not less than 15 lb. per 108 sq. ft.

Bitumen—The bitumen shall be Richardson Flex-A-Tile Asphalt, heated to a temperature of not over 360 degrees F., uniformly mopped. For each mopping use 30 lb. per 100 sq. ft.

Surfacing Material—The surfacing material shall be gravel or slag. 400 lb. of gravel or 300 lb. of slag ranging from ¼ to ⅝ in. in size shall be used for each 100 sq. ft. of surfacing. It shall be dry and free from dirt.

Thermometer—Use a thermometer, as all bituminous materials are easily destroyed by over-heating.

Method of Construction

First: The deck must be swept clean and free from all debris. It shall be constructed of seasoned lumber free from knot holes, large cracks and loose boards. The roof deck shall be properly graded to the outlets.

Second: Cover the entire surface with a layer of Richardson 30 lb. Felt, Viskalt Saturated, lapping each sheet not less than 2 in. over preceding one, nailing every 6 in. along the laps, and staggering nails 11 in. apart down the center of the sheet. Care must be taken to see that the nails are solidly seated and not driven between the boards.

Third: Mop the entire surface with a uniform and thorough coating of Richardson Flex-A-Tile Asphalt, using approximately 30 lb. per 100 sq. ft.

Fourth: Embed in the hot Richardson Flex-A-Tile Asphalt two layers of Richardson 15 lb. Felt, Viskalt Saturated, lapping each layer 19 in. over the preceding one, mopping between the laps a heavy coating of Richardson Flex-A-Tile Asphalt, so that in no place shall felt touch felt, thus forming a solid and continuous waterproofing membrane.

Fifth: Pour from a dipper a uniform coating of Richardson Flex-A-Tile Asphalt, using approximately 50 lb. per 100 sq. ft., into which, while hot, embed 400 lb. of gravel or 300 lb. of slag.

Base and Counter Flashings

All flashings shall be constructed in accordance with Richardson Special Flashing Specifications.

All metal flanges, flashings and edgings which are connected to roofing shall be set in hot Flex-A-Tile Asphalt on top of four plies of felt, nailed and double felt stripped, felt strips to be not less than double the width of the metal flange and cemented solidly together and to the flange with Flex-A-Tile Asphalt.

Waterproofing Walls

All walls, chimneys and other projections shall first be primed with Richardson Concrete Primer, and then mopped sufficiently high with Viskalt Roofing Compound to prevent absorption of moisture or leakage through brick or concrete. The entire fire walls or parapet walls above flashing line shall be given a thorough coating of Richardson Flex-A-Tile Asphalt.

Valleys and Gutters

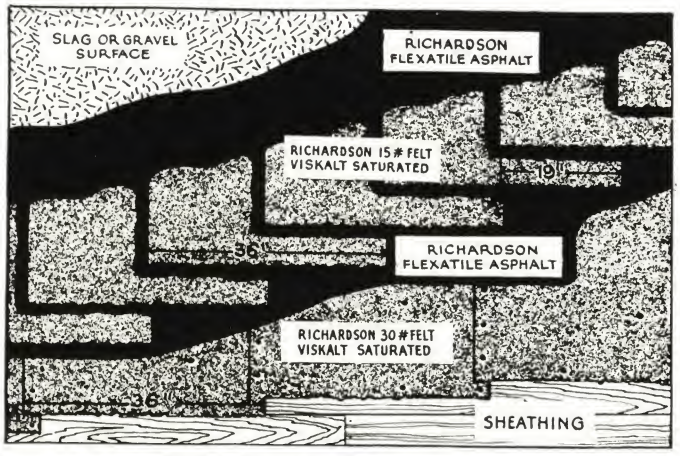
Reinforce all valleys and gutters by the use of an additional layer of Richardson Certified Felt, Viskalt Saturated, finishing the surfaces as outlined for final coating.

Bill of Materials Per Square

One layer Richardson 30 lb. Felt, Viskalt Saturated	30 lb.
Two layers Richardson 15 lb. Felt, Viskalt Saturated	30 lb.
Three layers Richardson Flex-A-Tile Asphalt	110 lb.
Gravel	400 lb.
Weight of completed roof	570 lb.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector, who shall cut the roof as he considers necessary. Such cuts shall be made before the application of gravel or slag. Such bonds will be given only when the roof is applied by a Richardson Franchise Roofer and in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.



STEEL DECKS

10-year Roof—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

STANDARD VISKALT BUILT-UP ROOFS—SPECIFICATION C-1-S

General Information

This specification calls for three layers of Richardson 15-lb. Felt, Viskalt Saturated, laid and bonded to the "Steel Roof Decks," as specified under "Application."

Richardson Felt, Viskalt Saturated, is put up in rolls of 432 sq. ft. each and weighs approximately 60 lb. per roll, or 15 lb. per 108 sq. ft. All felt is 36 in. wide.

Strips of felt cut to a width of 6 in. are used to close connecting joints where cross joints occur; also where roofing sheets connect with wall flashings, etc.

Asphalt

This type of roof requires approximately 12 gal. (108 lb.) of Viskalt Roofing Compound per 100 sq. ft. of roof surface.

Three gallons of Viskalt Roofing Compound per square is used for bonding first sheet of felt to the steel deck.

The two additional sheets of felt require three moppings of Viskalt Roofing Compound, or a total of 12 gal. to each 100 sq. ft. of 3-Ply Built-up Roof.

Flashing and Edging

Richardson Copperclad Flashing material is used for edging and counterflashing work on account of its great tensile strength, flexibility and durability. This material can be furnished in strips of various widths, rolls containing 50 lineal feet.

Work Proposed

This specification contemplates furnishing all materials and labor required to apply roofing and base flashings exclusive of any metal work.

Application

The steel deck shall be mopped with Viskalt Roofing Compound, into which, while hot, embed 3 layers of Richardson Felt, Viskalt Saturated, cementing solidly between the sheets so at no place shall felt touch felt; each sheet to overlap previous sheet, leaving 11 in. exposed and making a continuous 3-ply.

The felt may be run with the pitch or crosswise of the pitch of the roof, depending upon the prevailing conditions in connection with the type of building or roof surface to be covered.

The felt must be unrolled and set into the Viskalt Roofing Compound while the Viskalt Compound is hot in order to insure a perfect bond.

Allow all roofing sheets from the main deck to turn up on vertical walls from 2 to 3 in.

Lay a strip of Felt 6 in. wide, uncemented over expansion joint at ridge, cementing the roof sheets over same.

Nails (large head) are to be used along edging strips and other points where necessary.

Gutters

All gutters, valleys, etc., to be completed with 3 plies of Richardson Felt, Viskalt Saturated, Built-up Roof construction, in addition to reinforcing strips of felt.

All gutters and valley sheets to extend to the main roofing surface sufficiently to connect with the roofing felt extending from the main deck. All to be applied as specified under "Application."

Flashing

Lay a strip of Richardson Felt, Viskalt Saturated, 12 in. wide in the angle of all walls, allowing 6 in. to extend up the vertical surfaces and 6 in. on the main deck. The roofing felt from the main deck to be applied over this angle strip extending up the steel vertical wall from 2 to 3 in. high. On top of the roofing sheets from the main deck, set in separately 3 layers of felt, cut to a width of 12 in. solidly cemented together and to the underlying surface with hot Viskalt Compound.

The material used for counterflashing, Richardson Copperclad Flashing material, is furnished in strips to the steel erector and set in place by him in the steel wall or sill sheet before erection. This counterflashing strip to extend down the steel wall and out on the main roof deck at least 6 in., being mopped solid thereto with Viskalt Roofing Compound. Felt strips to be cemented over the connecting laps, both on the steel wall and where the counterflashing extends out on the main deck. All cross or end laps to be at least 3 in. and cemented solidly with Viskalt Compound and stripped with felt.

Eave and Gable Flashing

Apply the Richardson edging material so that it extends approximately ½ in. below steel membrane, bent at right angles and nailed into nailing bead on 2-in. centers by means of large head galvanized nails.

Edging material is to be laid in hot Viskalt Roofing Compound, and joints to have 4-in. lap and sealed.

Application and materials for gable edgings are the same as above with the exception that the edging material is to be applied over the top of the Built-up Roof to which a felt strip is added over the lap for additional protection.

Roof Finish

The entire surface of the roofing applied shall be mopped with Viskalt Roofing Compound applied hot and spread to a uniform finish.

Alternate Roof Finish

A protective coating of Richardson Emulsified Asphalt Roof Coating (liquid asphalt C-13 H.P.C.) shall be brushed or sprayed on cold using approximately 5 gal. for each 100 sq. ft. of roof surface. Richardson Emulsified Asphalt Roof Coating can be applied on damp surfaces with absolute success and certainty.

Notice to Owner or General Contractor—Attention must be given the following items:

All steel decks must be free from grease, dirt, oil, etc., and the weather surfaces properly coated.

All loose chips, nails or rubbish must be removed and the surface swept clean and maintained in such condition for the application of the Richardson Built-up Roof.

All sharp angles to be rounded out so as to avoid rough, sharp edges that would damage the roofing.

The general contractor is to supply and properly install all necessary sheet metal work, including downspouts, flashings for vent pipes, etc., so as to allow for the proper grading of roof.

Bill of Materials Per Square

Richardson Felt, Viskalt Saturated	45 lb.
Viskalt Roofing Compound (12 gal.)	108 lb.
Weight per square of completed roof	153 lb.

When "Insulation" is required the following specifications will cover the application of this material.

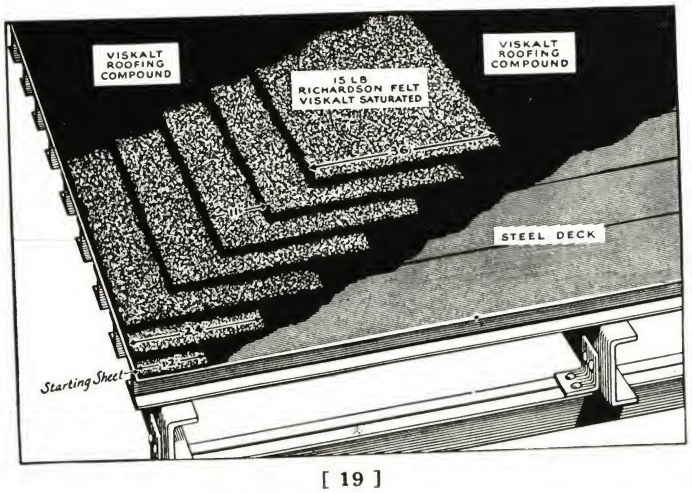
The "Steel Deck" shall be insulated with an approved insulating material, which shall be set in hot Viskalt Roofing Compound, and where necessary attached to the "deck" by means of approved fastening.

To assure perfect bond, no more area shall be mopped than will permit the laying of insulation while the Viskalt Compound is hot.

No more insulation shall be laid than can be fully waterproofed and sealed at edges during one day's operation.

Care must be taken to protect insulation from moisture prior to laying and during application.

On pitched roofs, with roof pitch over 3 in. in 12 in., all insulation shall be mechanically fastened to the "Steel Deck" with approved "Insulation" cleats. The cleat must be driven into the web of the supporting members, without puncturing the "Steel Deck."



Recommended Commercial Roof Insulation

Semi-flexible materials: Similar to flax and rye fibre, in sheet form.

Semi-rigid materials: Similar to cork, rock wool, etc., in board form.

Rigid Fibrous Materials: Similar to wood pulp and sugar cane, in sheet form.

It is the experience of manufacturers of roofing, that "Steel Decks" provide a most satisfactory base over which to apply insulations and waterproofing coverings. A "Steel Deck" insulated and waterproofed, is economical in that its lightness in weight allows for more economical design of supporting steel.

Note: Although the Richardson Roofing Company does not manufacture and market commercial "Insulation" or "Steel Decks," co-operation with the manufacturers of insulating materials and steel roof decks is an approved policy, for the purpose of preparing complete data, specifications, etc.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector who shall cut the roof as he considers necessary. Such bonds will be given only when the roof is laid by an Approved Richardson Franchise Roofer in strict accordance with the above specification. If Richardson Special Flashing Construction is used in conjunction with this specification, we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

STEEL DECKS

20-year Roofs—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

BUILT-UP ROOFS—SPECIFICATION A-1-S

This specification is the same as Specification C-1-S with the following exceptions:

The paragraph **"General Information"** should be changed to read "This specification calls for five layers of Richardson 15 lb. Felt, Viskalt Saturated, laid and bonded to the 'Steel Roof Decks' as specified under 'Application.'"

The third paragraph under **"Application"** should be changed to read: "The four additional sheets of felt require five moppings of Viskalt Roofing Compound, or a total of eighteen gallons to each 100 sq. ft. of 5-ply Built-up Roof."

The first paragraph under **"Application"** should be changed to read: "The steel deck shall be mopped with Viskalt Compound into which, while hot, embed five layers of Richardson Felt, Viskalt Saturated, cementing solidly between the sheets so at no place shall felt touch felt; each sheet to overlap the previous sheet 29½ in. and making a continuous 5-ply."

The first paragraph under **"Gutters"** should be changed to: "..... to be completed with five plies, etc."

The last sentence of the first paragraph under **"Flashing"** should be changed to: "..... set in separately five layers of felt."

Change **"Bill of Materials per Square"** to the following:

Richardson Felt, Viskalt Saturated..... 75 lb.
Viskalt Roofing Compound (18 gal.).....162 lb.

Weight per square of complete roof....237 lb.

"Bond" will be the same except "Twenty-Year" will be substituted for "Ten-Year."

APPLICATION OVER "RIGID INSULATION"

10-year Roofs—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Surfaced

STANDARD VISKALT BUILT-UP ROOFS—SPECIFICATION C-1-I

General Information

This specification calls for one layer of 30 lb. and two layers of Richardson 15-lb. Felt, Viskalt Saturated, laid and bonded to the "insulation" as specified under "Application."

Richardson Felt, Viskalt Saturated, is put up in rolls of 216 and 432 sq. ft. each and weighs approximately 60 lb. per roll, or 30 lb. and 15 lb. per 108 sq. ft. All felt is 36 in. wide.

Strips of felt cut to a width of 6 in. are used to close connecting joints where cross joints occur; also where roofing sheets connect with wall flashings, etc.

Asphalt

This type of roof requires approximately 12 gal. (108 lb.) of Viskalt Roofing Compound per 100 sq. ft. of roof surface, exclusive of material required for cementing "insulation" to deck, if such is required.

Three gal. of Viskalt Roofing Compound per square is used for bonding first sheet of felt to the "insulation."

The two additional sheets of felt require three moppings of Viskalt Roofing Compound, or a total of 12 gal. to each 100 sq. ft. of completed roof.

Flashing and Edging

Richardson Copperclad flashing material is used for edging and counterflashing work on account of its great tensile strength, flexibility and durability.

Work Proposed

This specification contemplates furnishing all materials and labor required to apply roofing and base flashings exclusive of any metal work.

Application

After the "insulation" has been installed, in accordance with the requirements for its application, mop the entire surface with Viskalt Roofing Compound, into which, while hot, embed a layer of Richardson 30-lb. Felt, Viskalt Saturated, cementing solidly to the insulating material. Thoroughly coat the surface of the 30-lb. felt, into which, while hot, embed two layers of Richardson 15-lb. Felt, Viskalt Saturated, cementing solidly between the sheets so at no place shall felt touch felt; each sheet to overlap previous sheet, leaving 17 in. exposed and making a continuous two-ply.

The felt must be unrolled and set into the Viskalt Roofing Compound, while hot, in order to insure proper bond.

Allow all roofing sheets from the main deck to turn up on vertical surfaces from 2 to 3 in.

Lay a strip of felt 12 in. wide, at right angles to all walls, as a flashing reinforcement prior to installation of flashing construction.

Nails (large heads) are to be used where necessary.

Gutters

All gutters, valleys, etc., to be completed with four plies of Richardson Felt, Viskalt Saturated, Built-up Roof construction, in addition to reinforcing strips of felt.

All gutters and valley sheets to extend to the main roofing surface sufficiently to connect with the roofing felt extending from the main deck. All to be applied as specified under "Application."

Flashing

Lay a strip of Richardson Felt, Viskalt Saturated, 12 in. wide in the angle of all walls, allowing 6 in. to extend on the vertical surfaces and 6 in. on the main roof. The roofing felt from the main roof to be applied over this angle strip, extending on the vertical wall, from 2 to 3 in. On top of the roofing sheets from the roof proper, set in separately three layers of felt, cut to a width of 12 in., solidly cemented together and to the underlying surfaces with hot Viskalt Compound, 6 in. extending up all vertical surfaces and 6 in. out onto roof proper.

The material used for counterflashing, Richardson Copperclad Flashing material, is furnished in strips to the Mason Contractor and set in place by him in the brick wall during course of construction. This counterflashing strip to extend down the

vertical wall and out on the main roof deck at least 8 in., being mopped solidly thereto with Viskalt Roofing Compound. All walls to be thoroughly primed with Asphalt Primer to insure proper bond. Felt strips to be cemented over connecting laps, both on the wall and where the counter-flashing extends out on main roof.

Roof Finish

The entire surface of the roofing applied shall be mopped with Viskalt Roofing Compound applied hot and spread to a uniform finish.

Alternate Roof Finish

A protective coating of Richardson Emulsified Asphalt Roof Coating (liquid asphalt C-13 H.R.C.) shall be brushed or sprayed on cold, using approximately 5 gal. for each 100 sq. ft. of roof surface. Richardson Emulsified Asphalt Roof Coating can be applied on damp surfaces with absolute success and certainty.

Bill of Materials Per Square

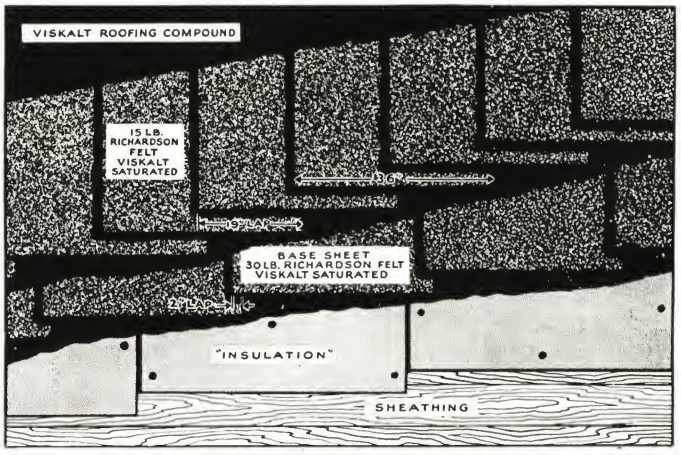
Richardson Felt, Viskalt Saturated..... 60 lb.
Viskalt Roofing Compound (12 gal.).....108 lb.
Weight per square of completed roof.....168 lb.

Application of "Insulation"—***Over Wood Deck***—The surface of the roof deck shall be broomed clear of all dirt and loose material and any loose boarding shall be properly nailed down. Over the entire roof area apply "Insulation Board" bringing edges to a moderate contact and securing each board in place by nailing along all edges and through the center of the sheet with large-headed and 1½-in. roofing nails. The course of nails through the center of the board shall be well driven. Nails shall be spaced 12 in. on center.

Where more than one layer of "Insulation Board" is used, each layer shall break joints with the preceding layer. Where multiple layers are used, nails of sufficient length to provide for a secure anchorage to the underlying deck shall be used. In such laminated or multiple layer construction, all nailing shall be done through the surface of the final board. For application of roof covering follow specifications as written above.

Over Concrete, Gypsum or Cement Tile—The deck shall be reasonably smooth, dry and well cured, and the surface of the roof cleared of all dirt and loose materials. Rough uneven surfaces will not provide a suitable base to receive the "Insulation," and the finished surface shall be subject to the approval of the Architect and acceptable to the Roofing Contractor before work will be started. The deck shall first receive a coat of asphalt primer. Mop with hot Viskalt Roofing Compound, using not less than 3 gal. per square, sufficient area to provide complete embedment of board used. Complete adhesion shall be obtained by carefully pressing down all edges into mopping of hot Viskalt Roofing Compound.

Where "Insulation Board" is to be applied in more than one layer, the top surface of each layer shall be coated with a uniform mopping of Viskalt Roofing Compound and all boards shall be thoroughly embedded and shall be laid with all joints broken or offset with respect to the joints of the preceding layer, and all edges of the board shall be completely coated. At no time shall boards be laid with alternate layers at right angles or crosswise with each other. Only as much board shall be laid over the roof area as can be covered and protected by the roof covering in any one day. The application of the roof covering shall be in accordance with "Application" as specified above.



Recommended Commercial Roof Insulation

Semi-flexible materials: Similar to flax and rye fibre, in sheet form.

Semi-rigid materials: Similar to cork, rock wool, etc., in board form.

Rigid fibrous materials: Similar to wood pulp and sugar cane fibre, in sheet form.

Note: Although the Richardson Roofing Company does not manufacture and market commercial "Insulation," co-operation with the manufacturers of insulating materials is an approved policy, for the purpose of preparing data, specifications, etc.

Bond

If a Richardson Ten-year Guaranty Bond is required, the roof shall be inspected by an authorized Richardson Inspector who shall cut the roof as he considers necessary. Such bonds will be given only when the roof is laid by a Richardson Franchise Roofer and in strict accordance with this specification. If Richardson Special Flashing Construction is used in conjunction with this specification, we will issue a flashing endorsement covering that part of the roof construction for a period of ten years.

APPLICATION OVER "RIGID INSULATION"

20-year Roof—Inclines Up to 6 In. to 1 Ft.—Viskalt Smooth Finish

BUILT-UP ROOFS—SPECIFICATION A-1-I

This specification is the same as Specification C-1-I with the following exceptions:

The paragraph **"General Information"** should be changed to read: "This specification calls for five layers of 15 lb. Richardson Felt, Viskalt Saturated, etc."

The first paragraph under **"Asphalt"** should be changed to read: "This type of roof requires approximately 20 gal. of Viskalt, etc."

The third paragraph under **"Asphalt"** should be changed to read: "The four additional sheets of felt require five moppings of Viskalt Roofing Compound, or a total of 20 gal. to each 100 sq. ft. of completed roof."

Under **"Application"** the first paragraph should be changed to read: ".....", while hot, embed five layers of Richardson 15 lb. Felt, Viskalt Saturated, cementing solidly to the insulating material. Lap each layer 29½ in. over the preceding layer, mopping between the laps a heavy coating of Viskalt Roofing Compound so that in no case shall felt touch felt."

The first paragraph **"Gutters"** should be changed to read: "..... to be completed with five plies of etc."

Under **"Flashing"** the last sentence of first paragraph should read: "....., set in separately five layers of felt, etc."

Change **"Bill of Materials per Square"** to the following:

Richardson Felt, Viskalt Saturated..... 75 lb.
Viskalt Roofing Compound (18 gal.).....162 lb.
Weight per square of completed roof...237 lb.

"Bond" will be the same except "Twenty-Year" will be substituted for "Ten-Year."

For Additional Specifications, see Chart, page 3

RICHARDSON FLASHING CONSTRUCTION

Richardson Ten-year Flashing Guarantee

Two types of flashing systems are described below, one in which metal base flashing is used and the other without the use of metal, but of built-up felt flashing against the walls. Both of these flashing systems will be guaranteed by 10 year bond if applied under the same conditions as for bonded roofs.

SPECIFICATIONS FOR USE WITH METAL BASE FLASHING

Preparation for Flashing Over Wood Roof Deck

Felt reinforcement at all wall angles, skylight curbs and other vertical surfaces shall be installed as follows:

Felt used as base sheet shall be carried up perpendicular surfaces at least four (4) ins. and the remaining plies of built-up roof cut off at angles of intersection of the roof deck and perpendicular surfaces.

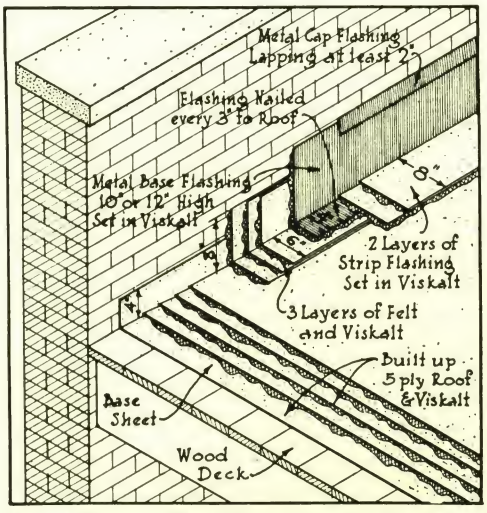
Three plies of felt shall then be set in the angle separately, extending out on the roof at least six (6) ins. and up the perpendicular surface at least (8) ins. All plies shall be cemented solidly together and to the underlying surface with Viskalt and the last ply shall be mopped with Viskalt before metal base flashing is set in place.

Preparation for Flashing Over Poured Concrete or Gypsum Deck

Note: Preparations are similar to that described above for wood deck except that *all* layers of roof felt are cut off at the intersection of the roof deck with vertical surfaces and preparations are then made for installing the flashing as previously described.

Metal Base Flashing for Wood Deck or Concrete Deck Having Railing Strips

Metal base flashing shall be (state metal and weight), extending onto the roof four (4) ins. on top of all roofing and vertically twelve (12) ins. Flashing shall be nailed to the roof decks every three (3) ins. and then felt stripped with two (2) strips not to be less than twice the width of the metal flange and to be solidly cemented together and to the flange with Viskalt.



Detail Showing Metal Flashing Built into Roof Over Wood Deck

Metal Cap Flashing

Shall be (state metal and weight) which shall be carried into brick wall at least four (4) ins. turned up at the end one (1) in. and carried down on the face of the wall to cover the base flashing at least two (2) ins.

Metal Base Flashing for Poured Concrete Deck Without Nailing Strips

Note: This applies when nails cannot be driven into concrete and nailing strips are not provided.

Before the roof is laid, set in three separate layers of felt extending out on the roof at least twenty eight (28) ins. and on the perpendicular at least eight (8) ins., cementing all together and to the base with Viskalt. The metal base shall then be set in place in a mopping of hot Viskalt. The built-up roofing shall then be applied in the regular manner, cutting all plies off evenly, at the angle of the metal base flashing.

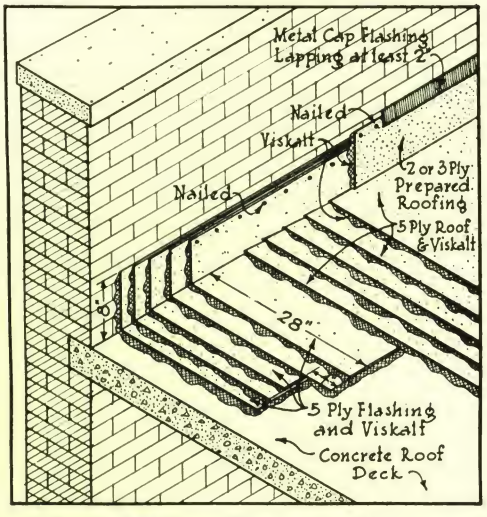
SPECIFICATIONS FOR BUILT-UP FLASHING, WHERE METAL BASE FLASHING IS NOT TO BE USED

(All roofing felt shall be applied in accordance with specifications for metal base flashing not nailed to the roof.)

For Wood Roof Deck—Five plies of felt shall be set in separately, all cemented together and to the underlying surface with Viskalt. The upper two plies shall extend out on the roof four (4) ins. beyond the other three. They shall be carried out on the roof deck twenty eight (28) ins. and up the wall eight (8) ins. and all securely fastened to vertical wall by nailing at the top. The last ply shall receive a thorough mopping of Viskalt.

For Concrete Deck—Five plies of felt shall be set in separately as for wood roof decks.

Metal Cap Flashings—Where metal flashings are to be installed, the cap flashing shall be securely fastened into the wall and pointed up, immediately after the base flashing has been built up.



Detail of Built-up Flashing on Concrete Roof Deck

Apply Felt Base Flashing

Over the five plies of felt and Viskalt previously laid on all vertical surfaces, a heavy coating of hot Viskalt shall be applied and into it immediately embed one layer of two (or three) ply Prepared Roofing or Mineral Surfaces Roofing which shall be securely fastened at the top with nails, or other satisfactory manner to prevent slipping.

Note: If cap flashing is not used the felt and prepared roofing shall be securely fastened at the top, pointed with plastic cement and stripped with fabric, or cleated with a lath, diamond cleat, etc.

Fire or Parapet Wall Less Than 20 Ins.—For walls this height a satisfactory flashing is secured by running the prepared or slate surfaced roofing flashing up the wall and under the coping. All walls should be primed and materials set in hot Viskalt.

Note: Felt reinforcement for 10-year roofs can be reduced one ply in all kinds of construction.

SPECIFICATIONS FOR FELT STRIPPING METAL FLANGES AND FLASHINGS AND FINISHING OFF EAVES

Felt Stripping Metal Flanges and Flashings

The term "Metal Flanges" shall apply to all metal connecting roof leaders, or vent connections, outlet boxes, ventilators, skylights, gravel guards, edging strips, or any metal connections extending out of the roof.

Metal flanges and flashings which are connected with the roofing shall be set in Viskalt on top of all roof plies, then nailed and double felt-stripped. Felt strips shall not be less than double the width of the metal flange, shall be solidly cemented together and to the flange with Viskalt.

Finishing Off Eaves and Edges

All exposed eaves and edges shall be properly finished with edging strip, gravel stop or metal guard, which must be securely nailed and felt stripped as described under "Felt Stripping of Metal Flanges and Flashings." Metal is preferred but wooden strips may be used if creosoted or coated with Viskalt.

RICHARDSON
ROOFING
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ASPHALT PRODUCTS · SHINGLES · ROOFINGS
FLINTKOTE
"PROTECTION"

GENUINE

RU-BER-OID

BONDED BUILT-UP ROOFS

Chicago Merchandise Mart

Asbestos . . Asphalt
Coal Tar Pitch and Felt

CONTINENTAL ROOFING MILLS | RUBEROID MILLS | SAFEPACK MILLS | H. F. WATSON MILLS

Divisions of

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95 Madison Avenue

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5333 South Western Avenue

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P. O. Box 494-5

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GENUINE RUBEROID BONDED ROOFS

Built of either

Asbestos—Coal Tar Pitch and Felt—Asphalt

Through the association of four great roofing companies, THE RUBEROID CO., with over 38 years of experience in the manufacture of quality roofing products, is now supplying Ruberoid Bonded Built-up Roofs in all of the popular types, Asbestos, Coal Tar Pitch and Felt and Asphalt. The factories of The RUBEROID CO. are producing the materials from which these roofs are constructed.

Ruberoid specifications comprising all types of built-up roofs enable architects to specify the type of roof best adapted to construction and climatic conditions. Ruberoid Bonded Built-up Roofs provide for the architect, builder and owner, a guarantee of both workmanship and labor for 10, 15 or 20 years, according to the specifications used. Ruberoid Bonded Roofs are applied only by approved roofing contractors and the guarantee is backed by a National Surety Bond.

Tabulated below is a chart showing the specifications generally used for various types of roofs—the guarantees applying and other essential information.

Should supplementary information be desired from our Engineering Department, write or telephone our nearest office.

CHART OF RUBEROID BONDED ROOFS, SPECIFICATIONS AND WEIGHTS OF MATERIALS

Roofing Specifications										Surfaces to be roofed		
Page number	Specification number	Guaranty bond, term of years	Underwriters' classification	Maximum slope inches per foot	Number of plies—membrane	Membrane material	Weight in pounds of plies of membrane per 100 sq. ft.	Cementing material	Finished surface material	Board sheathing	Precast gypsum blocks	Poured concrete Poured gypsum Precast concrete tile Book tile *Steel decks
2	†100	10		6	3	Asphalt felt Asbestos felt	1–30 2–15	Bond asphalt	Bond asphalt	×		
3	†101	10	A	6	3	Asphalt felt Asbestos felt	1–30 2–15	Bond asphalt	Bond asphalt		×	×
4	†150	15	A	6	3	Asbestos felt	1–60 2–15	Bond asphalt	Bond asphalt	×		
5	151	15	A	2	4	Tarred felt	4–15	Coal tar pitch	Gravel or slag	×	×	
6	152	15	A	1	3	Tarred felt	3–15	Coal tar pitch	Gravel or slag			×
5	153	15	A	4	4	Asphalt felt	4–15	Asphalt	Gravel or slag	×	×	
6	154	15	A	3	3	Asphalt felt	3–15	Asphalt	Gravel or slag			×
7	†200	20	A	6	4	Asbestos	1–60 3–15	Bond asphalt	Bond asphalt	×		
8	†201	20	A	6	3	Asbestos	1–60 2–15	Bond asphalt	Bond asphalt		×	×
9	202	20	A	2	5	Tarred felt	5–15	Coal tar pitch	Gravel or slag	×	×	
10	203	20	A	1	4	Tarred felt	4–15	Coal tar pitch	Gravel or slag			×
9	204	20	A	3	5	Asphalt felt	5–15	Asphalt	Gravel or slag	×	×	
10	205	20	A	3	4	Asphalt felt	4–15	Asphalt	Gravel or slag			×
*	206	20	A	1	5	Tarred felt	5–15	Coal tar pitch	Promenade tile	Concrete only		

**For complete specifications for Ruberoid Built-up Roof with Promenade Tile surface—also for Specification used over Steel Decks—write nearest office for catalogue of Ruberoid Bonded Built-up Roofs.*

†We are in a position to furnish a No. 20 Asphalt Saturated Asbestos Felt instead of a No. 15 where desired by Architects, Engineers and Consumers.

A FEW PROMINENT BUILT-UP ROOFING INSTALLATIONS

OWNER AND ADDRESS	NUMBER OF SQUARES	KIND OF FELT	ARCHITECT	ROOFER
General Motors Co., Pontiac, Mich.	12,000	Asphalt	Austin Co., Chicago	Michigan Roofing Co.
Caterpillar Tractor Co., Peoria, Ill.	8,500	Tarred and Asphalt	Austin Co., Chicago	J. W. Bushell Co.
Armour Leather Co., Williamsport, Pa.	3,000	Asphalt	Company	W. E. Probst & Son
Merchandise Mart Building, Chicago, Ill.	2,250	Asbestos	Graham, Anderson, Probst & White, Chicago	Esko Roofing Company
Standard Stoker Co., Erie, Pa.	1,200	Asbestos	Company	McCreary Roofing Co.
Atlantic Coast Line R. R., Montgomery, Ala.	1,060	Asbestos	Company	C. H. Johnson

A More Complete List of Large Built-up Roofing Installations Can Be Furnished on Request

ASBESTOS FELT AND ASPHALT FELT, SMOOTH FINISH ROOF

For Use Over Board Sheathing

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

SPECIFICATION NO. 100—10-YEAR BOND

The roofing shall be a Ruberoid Bonded Roof carrying a 10-year Guaranty Bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of The Ruberoid Co., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Asphalt—Ruberoid Bond Roofing Asphalt.

Asphalt Base-Felt—Ruberoid No. 30 Asphalt Base-Felt.

Asbestos Felt—Ruberoid No. 15 Asphalt-saturated Asbestos Felt.

Work by Others

The roof deck must be constructed of seasoned lumber, dressed on upper side, dry and free from large cracks and knot holes. Roof boards must be securely nailed in place, leaving no nail heads above the wood surfaces. Surfaces must be properly graded to outlets and cant strips provided in the angle formed between the roof and vertical surfaces.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the board surfaces and shall not proceed with roofing work until all defects reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others.

The contractor assumes responsibility for existing undersurfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

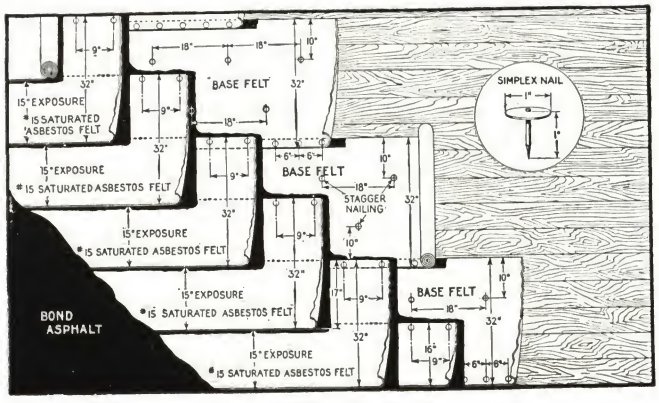
The contractor shall afford all necessary facilities for inspections by the manufacturer.

Specifications for Laying Roofing

First—Lay one ply of Asphalt Felt, lapping sheets 2-in. at edges and not less than 6-in. at end laps. Seal the laps with asphalt cement and nail at 3-in. intervals along the lap and at 18-in. intervals along lines 10-in. from each edge of each sheet, the latter nails being staggered. This felt shall be turned up not less than 4-in. along all walls and vertical surfaces.

Second—Over the entire surface lay two plies of Asbestos Felt, embedding each sheet in Asphalt, lapping each sheet 17-in. over the preceding one and rolling each sheet immediately behind the mop to insure proper adhesion of all strips. Mopping and rolling shall be so done as to secure a continuous bed of asphalt, of uniform thickness. In no place shall felt touch felt. Each sheet shall be nailed along the back edge only from 3-in. to 6-in. down, at intervals of approximately 9-in. These felts shall be cut off at the angle of the roof deck and all vertical surfaces.

Third—Over the entire surface mop a uniform coating of Asphalt, using not more than 20 lb. per 100 sq. ft.



Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roofing:

One ply Ruberoid No. 30 Asphalt Base-Felt	31 lb.
Two plies Ruberoid No. 15 Asphalt-Saturated Asbestos Felt	32 lb.
Ruberoid Bond Roofing Asphalt	75 lb.
Simplex nails	2 lb.
Total approximate weight, 100 sq. ft.	140 lb.

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails, driven through flat tin discs.

All roofing work shall be done to the satisfaction and approval of the manufacturer.

General Notes

Note 1—**Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails.

Provision must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance not greater than one width of the insulating material from parapet walls, curbs and other openings.

Note 2—**Leader Heads, Vents, etc.**—Leader heads, vents, and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bonds

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 10 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

ASBESTOS FELT AND ASPHALT FELT, SMOOTH FINISH ROOF

For Use Over Poured Concrete, Poured Gypsum, Gypsum Block, Precast Concrete Tile or Book Tile

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

SPECIFICATION NO. 101—10-YEAR BOND

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 10-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of THE RUBEROID Co., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Asphalt—Rubberoid Bond Roofing Asphalt.

Asphalt Base-Felt—Ruberoid No. 30 Asphalt Base-Felt.

Asbestos Felt—Rubberoid No. 15 Asphalt-saturated Asbestos Felt.

Primer—Rubberoid Concrete Primer.

Work by Others

The roof deck must be thoroughly dry, smooth and free from loose material, and must be properly graded to outlets.

For inclines exceeding 3-in. to the foot, if the deck is of concrete, wood nailing strips must be provided at proper intervals.

Coves shall be provided in the angle between the roof and the vertical surfaces.

Where Book Tile is used, the surface of the tile must be covered with portland cement mortar 1-in. thick with a smooth and even finish.

Where gypsum blocks are required for nailing, they must be solid blocks.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the base surfaces and shall not proceed with roofing work until all defects reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

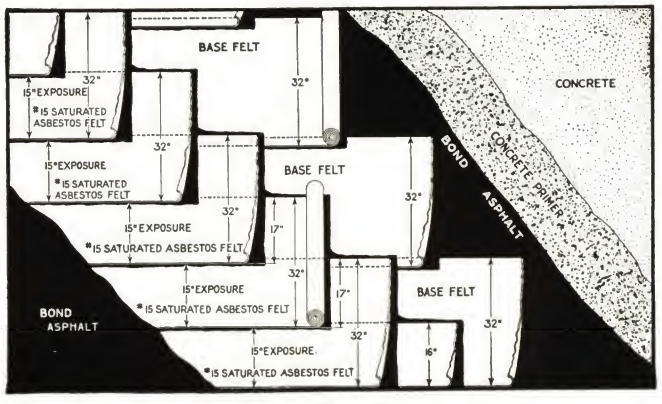
The contractor shall afford all necessary facilities for inspection by the manufacturer.

Specifications for Laying Roofing

First—Coat the entire surface with Primer applied cold, allowing same to dry thoroughly. Where plastic material is used to caulk the joints of blocks, the coating of primer shall be held back 2-in. from all joints.

Second—Over the entire surface lay one ply of Asphalt Felt in Roofing Asphalt, lapping each sheet 2-in. over the preceding one at edges and not less than 6-in. at end laps. Roll each sheet immediately behind the mop to insure proper adhesion of all sheets. Mopping and rolling shall be so done as to secure a continuous bed of asphalt of uniform thickness. In no place shall felt touch felt or roof deck. Felts shall be cut off at the angle of the roof deck and all vertical surfaces.

On inclines exceeding 3-in. to the foot these sheets shall be nailed at intervals of 9-in. along the lap into the nailing strips.



Note: Where poured gypsum or precast gypsum blocks are used, all three plies of felt shall be nailed as specified in the case of board decks.

Third—Over the entire surface lay in asphalt two plies of Asbestos Felt, lapping each sheet 17-in. over the preceding one, rolling each sheet immediately behind the mop to insure a uniform coating of hot asphalt. In no place shall felt touch felt.

On inclines exceeding 3-in. to the foot, sheets shall be nailed at intervals of 12-in. along the nailing strips or back edge.

These felts shall be cut off at the angle of the roof deck and vertical surfaces.

Fourth—Over the entire surface mop a uniform coating of asphalt, using not more than 20 lb. per 100 sq. ft.

Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roofing:

Ruberoid Concrete Primer (1 gal.)	10 lb.
One ply Ruberoid No. 30 Asphalt Base-Felt	31 lb.
Two plies Ruberoid No. 15 Asphalt-saturated Asbestos Felt	32 lb.
Ruberoid Bond Roofing Asphalt	110 lb.
Total approximate weight 100 sq. ft.	183 lb.

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails, driven through flat tin discs.

All roofing work shall be done to the satisfaction and approval of the manufacturer.

General Notes

***Note 1*—Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails. Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance not greater than one width of the insulating material from parapet walls, curbs and other openings.

***Note 2*—Leader Heads, Vents, Etc.**—Leader heads, vents and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 10 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

ASBESTOS AND ASPHALT MATERIALS, SMOOTH FINISH ROOF

For Use Over Board Sheathing

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

SPECIFICATION NO. 150—15-YEAR BOND

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 15-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of THE RUBEROID Co., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Asphalt—Ruberoid Bond Roofing Asphalt.

Asbestos Base-Felt—Ruberoid No. 60 Asbestos Base-Felt.

Asbestos Felt—Ruberoid No. 15 Asphalt-saturated Asbestos Felt.

Work by Others

The roof deck must be constructed of seasoned lumber, dressed on upper side, dry and free from large cracks and knot holes. Roof boards must be securely nailed in place, leaving no nail heads above the wood surfaces. Surfaces must be properly graded to outlets, and cant strips provided in the angle formed between the roof and vertical surfaces.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

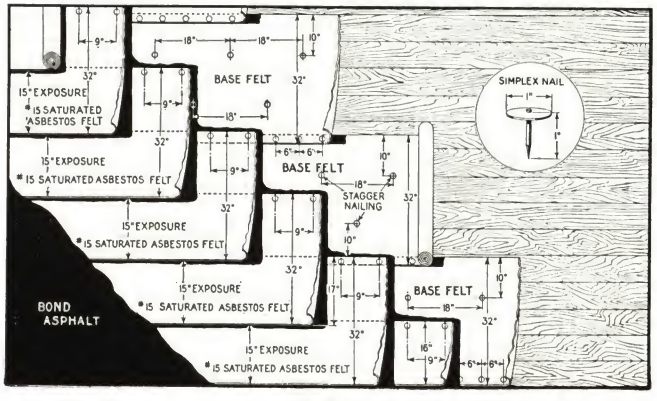
The contractor shall afford all necessary facilities for inspections by the manufacturer.

Specifications for Laying Roofing

First—Lay one ply of Asbestos Base-Felt, lapping each sheet 2-in. at edges and not less than 6-in. at end laps. Sealing the laps with asphalt cement and nail at 3-in. intervals along the lap, and also at intervals of 18-in. on a line 10-in. from each edge of the sheet, staggering the nails. This felt shall be turned up not less than 4-in. along all walls and vertical surfaces.

Second—Over the entire surface embed in Asphalt two plies of Asbestos Felt lapping each sheet 17-in. over the preceding one and rolling each sheet immediately behind the mop to insure a uniform coating of hot asphalt so that in no place shall felt touch felt. Each sheet shall be nailed along the back edge from 3 to 6-in. down at intervals of approximately 9-in. These felts shall be cut off at the angle of the roof deck and all walls or vertical surfaces.

Third—Over the entire surface mop a uniform coating of Asphalt, using not more than 20 lb. per 100 sq. ft.



Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roofing:.

One ply Ruberoid No. 60 Asbestos Base-Felt	60 lb.
Two plies Ruberoid No. 15 Asphalt-saturated Asbestos Felt	32 lb.
Ruberoid Bond Roofing Asphalt	75 lb.
Simplex Nails	2 lb.
Total approximate weight 100 sq. ft.	169 lb.

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with 7/8-in. galvanized roofing nails, driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

General Notes

Note 1—**Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails.

Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance of not greater than one width of the insulating material from parapet walls, curbs and other openings.

Note 2—**Leader Heads, Vents, etc.**—Leader heads, vents, and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 15 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

COAL TAR PITCH AND TARRED FELT, GRAVEL OR SLAG FINISH ROOF

For Use Over Board Sheathing and Precast Gypsum Blocks

For Inclines Not Exceeding 2-In. per Ft.

SPECIFICATION NO. 151—15-YEAR BOND*

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 15-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of THE RUBEROID Co., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Tarred Felt—Ruberoid No. 15 Tarred Felt.

Coal Tar Pitch—Ruberoid Coal Tar Pitch.

Work by Others

If over boards, the roof deck shall be constructed of seasoned lumber, smooth and securely nailed, and free from large cracks or knot holes. It shall be properly graded to outlets and swept clean and free from all loose material.

Where gypsum blocks are required for nailing they must be solid blocks.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects, reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

The contractor shall afford all necessary facilities for inspections by the manufacturer.

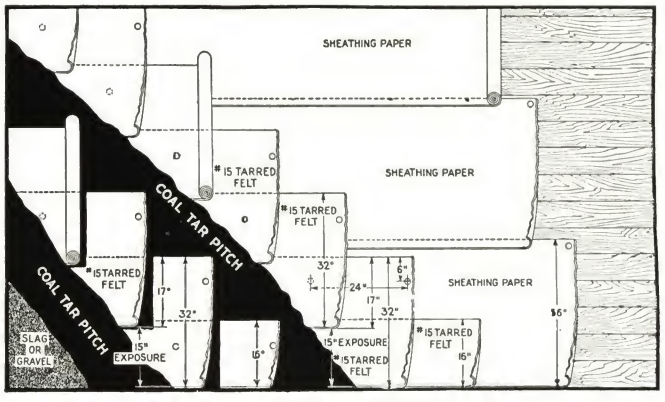
Specifications for Laying Roofing

First—Lay one thickness of sheathing paper, weighing not less than 5 lb. per 100 sq. ft., lapping the sheets at least 1-in. If Precast Gypsum Block is used, sheathing paper may be omitted.

Second—Over the entire surface lay two plies of Tarred Felt, lapping each sheet 17-in. over the preceding one, and turning up these felts not less than 4-in. along all vertical surfaces. Nail as often as is necessary to secure, until the remaining felt is laid.

Third—Coat the entire surface uniformly with Coal Tar Pitch.

Fourth—Over the entire surface lay two plies of Tarred Felt, lapping each sheet 17-in. over the preceding one, mopping with Coal Tar Pitch the full 17-in. on each sheet, so that in no place shall felt touch felt. The back edge of each sheet shall be nailed at intervals of 24-in. at a distance not greater than 6-in. from back edge of sheet. Such nailing as is necessary shall be done so that all nails are covered by not less than one ply of felt. The felts shall be cut off at the angle of the roof deck and walls or vertical surfaces.



Fifth—Over the entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. The gravel or slag shall be ¼-in. to ⅝-in. in size, dry and free from dirt. If the roof is applied during cold weather, or the slag or gravel is damp, it shall be heated and dried immediately before application.

Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roof area:

One-layer Sheathing Paper	5 lb.
Four plies Ruberoid No. 15 Tarred Felt	65 lb.
Ruberoid Coal Tar Pitch	125 lb.
Simplex nails	1 lb.
Roofing gravel	400 lb.
or	
Roofing slag	300 lb.
Total approximate weight.. gravel surface	596 lb.
Total approximate weight.. slag surface	496 lb.

Felt shall be laid without wrinkles or buckles. Pitch shall not be heated to exceed 400° F.

All nailing of roofing shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails, driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

General Notes

Note 1—**Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails. Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance of not greater than one width of the insulating material from parapet walls, curbs, and other openings.

Note 2—**Leader Heads, Vents, etc.**—Leader heads, vents, and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 15 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

*SPECIFICATION NO. 153—ASPHALT FELT AND ASPHALT WITH SLAG OR GRAVEL SURFACE

15-Year Bond—Underwriters Class A Rating—For inclines not exceeding 4-in. per ft.

Construction identical with No. 151, except that no sheathing paper is required.

COAL TAR PITCH AND TARRED FELT, GRAVEL OR SLAG FINISH ROOF

For Use Over Poured Concrete, Poured Gypsum, Precast Concrete Tile or Book Tile

For Inclines Not Exceeding 1-In. per Ft.

SPECIFICATION NO. 152—15-YEAR BOND*

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 15-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of THE RUBEROID CO., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Tarred Felt—Ruberoid No. 15 Tarred Felt.

Coal Tar Pitch—Ruberoid Coal Tar Pitch.

Work by Others

The roof deck shall be thoroughly dry, smooth and free from loose material, and properly graded to outlets.

Where Book Tile is used the surface of the tile shall be covered with portland cement mortar 1-in. thick with smooth and even finish.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects, reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

The contractor shall afford all necessary facilities for inspection by the manufacturer.

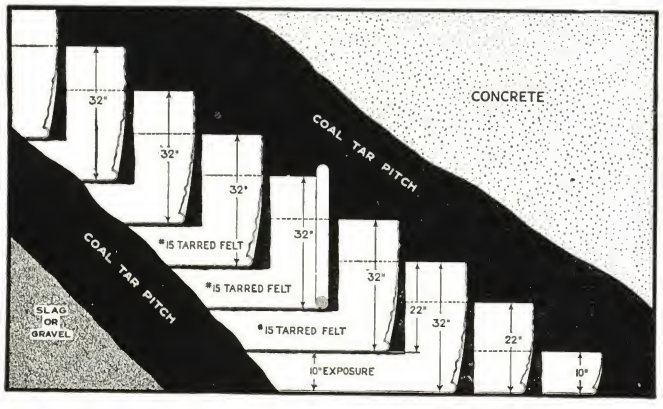
Specifications for Laying Roofing

First—Coat the deck uniformly with Coal Tar Pitch. If Precast Concrete Tile is used, the surface shall be spot or strip mopped.

Second—Over the entire surface lay three plies of Tarred Felt lapping each sheet 22-in. over the preceding one and mopping with Coal Tar Pitch the full 22-in. on each sheet so that in no place shall felt touch felt. The felt shall be cut off at the angle of the roof deck and walls or vertical surfaces.

Third—Over the entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. The gravel or slag shall be from ¼-in. to ⅝-in. in size, dry and free from dirt.

If the roof is applied during cold weather, or slag or gravel is damp, it shall be heated and dried immediately before application.



Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roof area:

Three plies Ruberoid No. 15 Tarred Felt	50 lb.
Ruberoid Coal Tar Pitch	175 lb.
Roof gravel	400 lb.
or	
Roofing Slag	300 lb.
Total approximate weight.. gravel surface	625 lb.
Total approximate weight.. slag surface	525 lb.

All felt shall be laid without wrinkles or buckles. Pitch shall not be heated to exceed 400° F.

All roofing shall be done to the satisfaction and approval of the manufacturer.

General Notes

Note 1—Insulated Roofs—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails.

Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance of not greater than one width of the insulating material from parapet walls, curbs and other openings.

Note 2—Leader Heads, Vents, Etc.—Leader heads, vents and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 15 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

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*SPECIFICATION NO. 154—ASPHALT FELT AND ASPHALT WITH SLAG OR GRAVEL SURFACE

15-Year Bond—Underwriters Class A Rating—For inclines not exceeding 3-in. per ft.

Construction Identical with No. 152, except that a primer is used.

ASBESTOS AND ASPHALT MATERIALS, SMOOTH FINISH ROOF

For Use Over Board Sheathing

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

SPECIFICATION NO. 200—20-YEAR BOND

Underwriters' Laboratories Class A Rating

The roofing shall be Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of THE RUBEROID Co., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Asphalt—Ruberoid Bond Roofing Asphalt.

Asbestos Base-Felt—Ruberoid No. 60 Asbestos Base-Felt.

Asbestos Felt—Ruberoid No. 15 Asphalt-saturated Asbestos Felt.

Work by Others

The roof deck must be constructed of seasoned lumber, dressed on upper side, dry and free from large cracks and knot holes. Roof boards must be securely nailed in place, leaving no nail heads above the wood surfaces. Surfaces must be properly graded to outlets, and cant strips provided in the angle formed between the roof and vertical surfaces.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

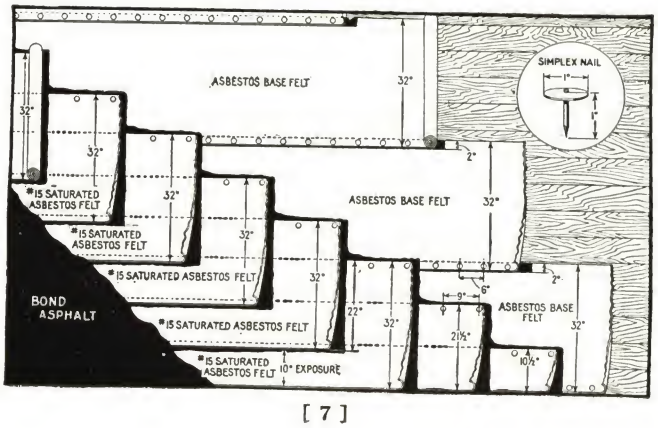
Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

The contractor shall afford all necessary facilities for inspections by the manufacturer.

Specifications for Laying Roofing

First—Lay one ply of Asbestos Base-Felt, lapping each sheet 2-in. at edges and not less than 6-in. at end laps. Seal the laps with Asphalt cement, and nail at 3-in. intervals along the lap, turning this sheet up not less than 4-in. along all vertical surfaces.

Second—Over the entire surface embed in Asphalt three plies of Asbestos Felt, lapping each sheet 22-in. over the preceding one, rolling each sheet immediately behind the mop to insure a uniform coating of hot Asphalt so that in no place shall felt touch felt. Each sheet shall be nailed along the back edge from 3 to 6-in down at intervals of approximately 9-in. These felts shall be cut off at the angle of the roof deck and walls or vertical surfaces.



Third—Over the entire surface mop a uniform coating of Asphalt using not more than 20 lb. per 100 sq. ft.

Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roof area:

One ply Ruberoid No. 60 Asbestos Base-Felt	60 lb.
Three plies Ruberoid No. 15 Asphalt-saturated Asbestos Felt	48 lb.
Ruberoid Bond Roofing Asphalt	95 lb.
Simplex nails	2 lb.
Total approximate weight per 100 sq. ft.	205 lb.

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt. The Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

General Notes

Note 1—**Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails. Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance of not greater than one width of the insulating material from parapet walls, curbs and other openings.

Note 2—**Leader Heads, Vents, Etc.**—Leader heads, vents, and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 20 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

ASBESTOS AND ASPHALT MATERIALS, SMOOTH FINISH ROOF

For Use Over Poured Concrete, Poured Gypsum, Gypsum Block, Precast Concrete Tile or Book Tile

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

SPECIFICATION NO. 201—20-YEAR BOND

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of THE RUBEROID Co., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Asphalt—Ruberoid Bond Roofing Asphalt.

Asbestos Base-Felt—Ruberoid No. 60 Asbestos Base-Felt.

Asbestos Felt—Ruberoid No. 15 Asphalt-saturated Asbestos Felt.

Concrete Primer—Ruberoid Concrete Primer.

Work by Others

The roof deck shall be thoroughly dry, smooth and free from loose material, and properly graded to outlets.

Where Book Tile is used the surface of the tile shall be covered with portland cement mortar 1-in. thick with a smooth and even finish.

Where poured gypsum or precast gypsum blocks are used, all felt shall be nailed as required when the roof deck is of boards. Gypsum blocks for nailing must be solid blocks.

For inclines exceeding 3-in. to the foot, if the deck is of concrete wooden nailing strips must be provided at proper intervals.

Cant strips shall be provided in the angle formed between the roof and vertical surfaces.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects, reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

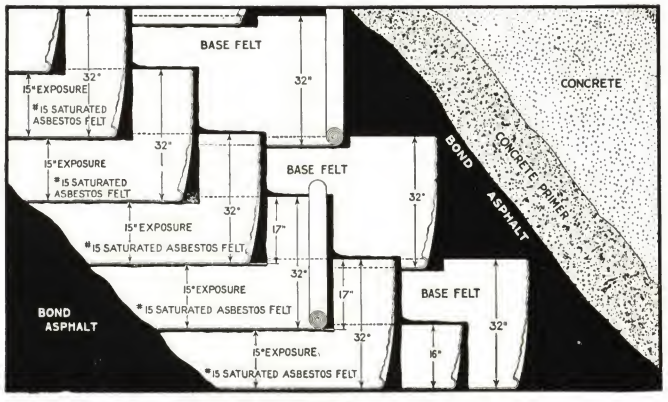
Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

The contractor shall afford all necessary facilities for inspections by the manufacturer.

Specifications for Laying Roofing

First—Coat the entire surface with Concrete Primer applied cold and allow same to dry thoroughly. Where plastic material is used to caulk the joints of blocks, the coating of primer shall be held back 2-in. from all joints.

Second—Over the entire surface embed in Asphalt one ply of Asbestos Base-Felt lapping each sheet 2-in. over the preceding one at edges and not less than 6-in. at end laps. Mop between the laps and nail at intervals of 12-in. along the laps into the nailing strip. All felts shall be cut off at the angle of the roof deck and all walls or vertical surfaces.



Third—Over the entire surface embed in Asphalt two plies of Asbestos Felt, lapping each sheet 17-in. over the preceding one, rolling each sheet immediately behind the mop to insure a uniform coating of hot asphalt so that in no place shall felt touch felt.

On inclines exceeding 3-in. to the foot, these sheets shall be nailed 6-in. from the back edge at intervals of 24-in. All felts shall be cut off at the angle of the roof deck and all walls or vertical surfaces.

Fourth—Over the entire surface mop a uniform coating of Asphalt, using not more than 20 lb. per 100 sq. ft.

Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roof area:

Ruberoid Concrete Primer (1 gal.)	10 lb.
One ply Ruberoid No. 60 Asbestos Base-Felt	60 lb.
Two plies Ruberoid No. 15 Asphalt-saturated Asbestos Felt	32 lb.
Ruberoid Bond Roofing Asphalt	110 lb.
Total approximate weight per 100 sq. ft.	212 lb.

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly imbedded by brooming the felt.

All nailing of roofing to roof surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails, driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

General Notes

Note 1—**Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails. Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance of not greater than one width of the insulating material from parapet walls, curbs and other openings.

Note 2—**Leader Heads, Vents, etc.**—Leader heads, vents, and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 20 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

COAL TAR PITCH AND TARRED FELT, GRAVEL OR SLAG FINISH ROOF

For Use Over Board Sheathing and Precast Gypsum Blocks

For Inclines Not Exceeding 2-In. per Ft.

SPECIFICATION NO. 202—20-YEAR BOND*

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows.

Manufacturer—Ruberoid Mills division of THE RUBEROID Co., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Tarred Felt—Ruberoid No. 15 Tarred Felt.

Coal Tar Pitch—Ruberoid Coal Tar Pitch.

Work by Others

If over boards, the roof deck shall be constructed of seasoned lumber, smooth and securely nailed, and free from large cracks or knot holes. It shall be properly graded to outlets and swept clean and free from all loose material.

Where gypsum blocks are required for nailing they must be solid.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects, reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

The contractor shall afford all necessary facilities for inspection by the manufacturer.

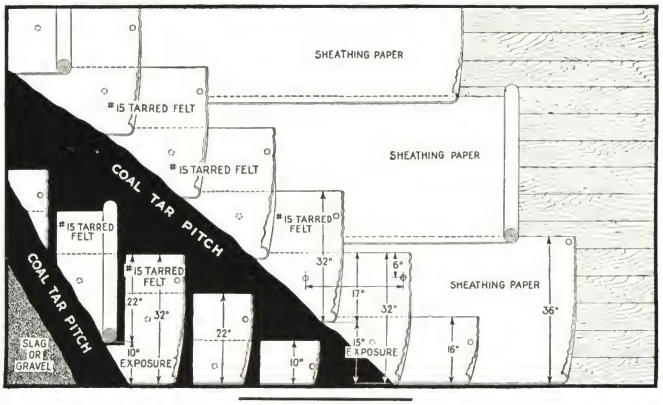
Specifications for Laying Roofing

First—Lay one thickness of sheathing paper, weighing not less than .5 lb. per 100 sq. ft., lapping the sheets at least 1-in. If Precast Gypsum Block is used, sheathing paper may be omitted.

Second—Over the entire surface lay two plies of Tarred Felt, lapping each sheet 17-in. over the preceding one and nailing as often as is necessary to secure, until the remaining felt is laid. These felts shall be turned up not less than 4-in. along all walls or vertical surfaces.

Third—Coat the entire surface uniformly with Coal Tar Pitch.

Fourth—Over the entire surface lay three plies of Tarred Felt, lapping each sheet 22-in. over the preceding one, mopping with Coal Tar Pitch the full 22-in. on each sheet, so that in no place shall felt touch felt. The back edge of the sheet shall be nailed at intervals of 24-in. at a distance not greater than 6-in. from the back edge of the sheet. Such nailing as is necessary shall be done so that all nails are covered by not less than two plies of felt. These felts shall be cut off at the angle of the roof deck and walls or vertical surfaces.



Fifth—Over the entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. The gravel or slag shall be ¼-in. to ⅝-in. in size, dry and free from dirt. If the roof is applied during cold weather or slag or gravel is damp, it shall be heated and dried immediately before application.

Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roof area:

One layer Sheathing Paper	5 lb.
Five plies Ruberoid No. 15 Tarred Felt	80 lb.
Ruberoid Coal Tar Pitch	150 lb.
Simplex nails	2 lb.
Roofing gravel	400 lb.
or	
Roofing slag	300 lb.

Total approximate weight { gravel surface .... 637 lb. / slag surface ..... 537 lb.

The felt shall be laid without wrinkles or buckles, and the pitch shall not be heated to exceed 400° F.

All nailing of roofing shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails, driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

General Notes

***Note 1*—Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails. Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance of not greater than one width of the insulating material from parapet walls, curbs and other openings.

***Note 2*—Leader Heads, Vents, etc.**—Leader heads, vents, and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 20 years from date of completion of work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

***SPECIFICATION NO. 204—ASPHALT FELT AND ASPHALT WITH SLAG OR GRAVEL SURFACE**

20-Year Bond—Underwriters Class A Rating—For inclines not exceeding 3-in. per ft.

Construction Identical with No. 202, except that no sheathing paper is used.

COAL TAR PITCH AND TARRED FELT, GRAVEL OR SLAG FINISH ROOF

For Use Over Poured Concrete, Poured Gypsum, Precast Concrete Tile or Book Tile

For Inclines Not Exceeding 1-In. per Ft.

SPECIFICATION NO. 203—20-YEAR BOND*

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

Definitions

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—Ruberoid Mills division of THE RUBEROID CO., whose main office is at No. 95 Madison Avenue, New York, N. Y.

Contractor—The contractor for roofing work.

Tarred Felt—Ruberoid No. 15 Tarred Felt.

Coal Tar Pitch—Ruberoid Coal Tar Pitch.

Work by Others

The roof deck shall be thoroughly dry, smooth and free from loose material, and properly graded to outlets.

Where Book Tile is used the surface of the tile shall be covered with portland cement mortar 1-in. thick with a smooth and even finish.

General Requirements Applying to the Contractor

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects reasonably apparent by proper inspection and which might injure the roofing have been remedied by others. The contractor assumes responsibility for existing under-surfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

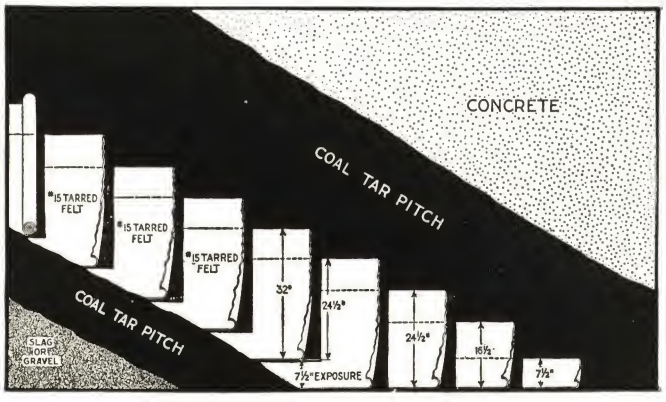
The contractor shall afford all necessary facilities for inspections by the manufacturer.

Specifications for Laying Roofing

First—Coat the roof deck uniformly with Coal Tar Pitch. If Precast Concrete Tile is used, the surface shall be spot or strip mopped.

Second—Over the entire surface lay four plies of Tarred Felt, lapping each sheet 24½-in. over the preceding one and mopping with Coal Tar Pitch the full 24½-in. on each sheet so that in no place shall felt touch felt. These felts shall be cut off at the angle of the roof deck and walls or vertical surfaces.

Third—Over the entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. The gravel or slag shall be from ¼-in. to ⅝-in. in size, dry and free from dirt. If the roof is applied during cold weather, or slag or gravel is damp, it shall be heated and dried immediately before application.



Materials and Workmanship

Not less than the following quantities of materials shall be used in constructing each 100 sq. ft. of roof area:

Four plies Ruberoid No. 15 Tarred Felt	65 lb.
Ruberoid Coal Tar Pitch	200 lb.
Roofing Gravel	400 lb.
or	
Roofing Slag	300 lb.
Total approximate weight { gravel surface	665 lb.
Total approximate weight { slag surface	565 lb.

The felt shall be laid without wrinkles or buckles, and the pitch shall not be heated to exceed 400° F.

All roofing shall be done to the satisfaction and approval of the manufacturer.

General Notes

Note 1—**Insulated Roofs**—If this roof is applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails. Provisions must be made that no more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of insulation at a distance of not greater than one width of the insulating material from parapet walls, curbs and other openings.

Note 2—**Leader Heads, Vents, etc.**—Leader heads, vents and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scupper, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

Bond

This contractor shall furnish the Manufacturer's Surety Bond Guaranty as issued by the National Surety Company of New York, N. Y., covering a period of 20 years from date of completion of the work.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service.

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*SPECIFICATION NO. 205—ASPHALT FELT AND ASPHALT WITH SLAG OR GRAVEL SURFACE

20-Year Bond—Underwriters Class A Rating—For inclines not exceeding 3-in. per ft.

Construction Identical with No. 203, except that a primer is used.

GENUINE

RU-BER-OID

BONDED

BUILT-UP

ROOFS

CERTAIN-TEED PRODUCTS CORPORATION

ROOFING DIVISION

Manufacturers of Roll Roofing, Felts, Building Papers and Asphalt Coatings

GENERAL OFFICES

100 East 42nd Street, NEW YORK, N. Y.

For Sales Offices, see Gypsum Plaster Pages

ROOFING DIVISION PLANTS

MARSEILLES, ILL. NIAGARA FALLS, N. Y. RICHMOND, CALIF. KANSAS CITY, MO.
PORT WENTWORTH, GA. EAST ST. LOUIS, ILL. YORK, PA.

Products

CERTAIN-TEED SMOOTH SURFACED and SLATE SURFACED ROLL ROOFING.

CERTAIN-TEED ASPHALT FELT and DEADENING FELTS.

CERTAIN-TEED ASPHALT ROOF COATING.

TRADE-MARK

CERTAIN-TEED INSULATING and SHEATHING PAPERS.

CERTAIN-TEED PLASTIC CEMENT.

CERTAIN-TEED ASBESTOS ROOF COATING.

For our other Products, see Manufacturers' Index.

Certain-teed Roofing Products

No effort is spared to safeguard the high quality of Certain-teed Roofing products. Careful selection of the best raw materials, rigid supervision during manufacture, and the most advanced methods of production have resulted in the widespread use of Certain-teed Roofings wherever superior quality is required.

Certain-teed Roll Roofings and allied products cover the entire range of roofing requirements. These roofs succeed wherever they are used, because each product is adapted to certain conditions, and there is a Certain-teed Roof for every type of building—from the most important structures to temporary shelters.

For complete specifications and information regarding Certain-teed Built-up Roof construction, see Manufacturers' Index for pages.

Distribution

Certain-teed products are handled by jobbers and dealers throughout the United States and also in principal countries throughout the world.

Certain-teed Smooth Surfaced Roll Roofings

Certain-teed Smooth Surfaced Roofing is recommended for use where the highest quality roofing and the most satisfactory service are required. In every corner of the world, this sturdy roofing has weathered many climes and withstood the ravages of passing seasons.

It is the uniform and dependable quality of this product that has won the friendship of leading architects and contractors in many countries. Exceptional durability and lasting protection have built up a world-wide reputation that only a superior product might enjoy.

Certain-teed Smooth Surfaced Roofing is put up in rolls of 108 sq. ft., with nails and cement enclosed. It is packed one square per roll—enough to cover 100 sq. ft. of roof surface with 8 sq. ft. for laps.

No. 1, light, about 35 lb. per square, guaranteed 5 years.
No. 2, medium, about 45 lb. per square, guaranteed 10 years.
No. 3, heavy, about 55 lb. per square, guaranteed 15 years.
No. 4, extra heavy, about 65 lb. per square, guaranteed 15 years.

Certain-teed Mineral Surfaced Roll Roofing

A high grade of asphalt roofing, surfaced with colorful mineral granules in their natural hues. This surface provides additional protection against weathering, and is highly fire-resistant. The colors, moreover, are in line with modern roofing requirements, and require no staining or painting at any time. Suitable for use where a decorative roof is required at minimum cost. Guaranteed ten years.

Put up in rolls of 108 sq. ft.; weight 87 lbs.

Certain-teed Asphalt Felt

Widely used as a waterproof liner under slate, tile and other roofings. Suitable for built-up roof construction. High waterproofing and insulating properties likewise recommend this product for all sheathing and lining purposes where the very best results are desired.

Certain-teed Asphalt Felt is available in the following weights:

No. 15, about 62 lb. per roll, 432 sq. ft.
No. 30, about 62 lb. per roll, 216 sq. ft.

Certain-teed Insulating Paper

A high grade, black insulating paper, used for general sheathing and lining purposes. Saturated and coated with asphalt to insure greater durability and the highest waterproofing qualities. This product is entirely odorless and does not affect food flavors in any way. Widely used in constructing refrigerators, icehouses, dairies, etc., and for lining shipping cases. In sheathing homes it saves fuel in winter and keeps out summer heat during the warm seasons. Frequently laid between subfloors for insulation.

Furnished 36 in. wide in rolls containing approximately 500 sq. ft. Made in two weights: Medium, about 35 lb. per roll; Heavy, about 50 lb. per roll.

Certain-teed Tarred Felt

This product consists of a rag felt thoroughly saturated with coal tar in every way that meets the standard of architects and builders. Tarred felt is principally used in built-up roofs of felt, pitch and gravel. This tarred felt is also used for sheathing residences, store buildings and similar structures. 32 in. wide in following sizes:

No. 12, about 50 lb. per roll, 432 sq. ft.
No. 15, about 64 lb. per roll, 432 sq. ft.
No. 20, about 44 lb. per roll, 216 sq. ft.

Deadening Felt

A thick, durable felt, suitable for laying between double floors and in walls as an insulating agent against sound, heat and cold. It is made in 50-yard rolls 36 in. wide in the following weights:

No. 40, about 40 lb.
No. 50, about 50 lb.
No. 75, about 75 lb.

Certain-teed Asphalt Roof Coating

Resaturates and preserves the life of smooth surfaced roofing. Applied every three or four years it will preserve a roof indefinitely. Also used for protecting metal surfaces of all kinds, as a preservative for rough timber work, and for waterproofing stone and concrete foundations. Certain-teed Roof Coating is strongly adhesive and elastic, and does not crack nor peel off. It will give long and satisfactory service.

BIRD & SON, inc.

Manufacturers of Asphalt Shingles, Building Papers and Insulating Products

MILLS AND GENERAL OFFICES
EAST WALPOLE, MASS.
CHICAGO OFFICE AND PLANT: 1472 West 76th Street
NEW YORK OFFICE: 295 Fifth Avenue
CANADA: Building Products Ltd., HAMILTON, ONT., MONTREAL, QUE.

Products

BIRD ASPHALT SLATE SURFACED THICK BUTT SHINGLES.

For our pages on Built-up Roofs and Roll Roofing, Neponset Black Building Paper and other Waterproof Building Papers, and Bird Insulating Board, see Manufacturers' Index.

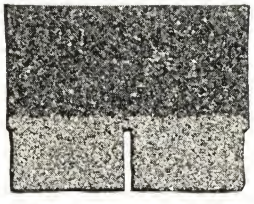
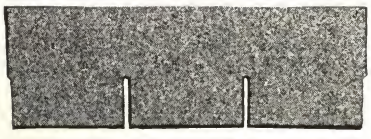
Experience and Facilities

BIRD & SON, inc., was established in 1795, and after years of experience in paper manufacturing became one of the pioneers in specializing in the manufacture of waterproof building paper and asphalt roofings.

The highest quality of materials is maintained through the most up-to-date machinery and methods and a highly efficient personnel. The several mills and warehouses of the company provide for prompt shipment anywhere.

Bird products have been distributed and applied to buildings of every description throughout the world and have long been known to be of the highest grade.

TYPES AND SPECIFICATIONS OF BIRD ASPHALT SHINGLES THAT ARE OF SPECIAL INTEREST TO ARCHITECTS

Name	Shape of Shingle	Colors	Size, in.	Approx. weight per sq., lb.	Shingles per square	Head lap, in.	Exposure, in.
Bird Custom-Built Shingle (ragged edge)		Slate-Blende in combination or individual colors. Made to order in other colors.	12 x 18	464 403	200 172	6 4	6 7
Bird Giant Super Twin (Thick Butt) Coarse Slate Finish		Red, Green, Black Art-Blende Slate-Blende Sun-glo Emerald	15 x 20	346	144	5	5
Bird Giant Individual		Red, Green, Black Bright red Art-Blende red Art-Blende buff Art-Blende black Emerald	12 x 16	306	226	6	5
Bird 3-in-1 Thick Butt Super Strip		Red, Green, Black Emerald Bright red Slate-blende Sun-glo	12 x 36	240	80	2	5

In addition to these four shingles, BIRD & SON, inc. manufacture a complete line of standard shingles in a wide assortment of colors.

BIRD CUSTOM BUILT SHINGLES
(Ragged Edge)

These shingles are designed for use on the finest buildings — residences, hospitals, schools — wherever shingles, slate or tile can be used.

Bird Custom Built Shingles comprise such essential and fundamental improvements in composition and manufacture that the Underwriters' Laboratories, Inc. have given them the Class B Label rating.

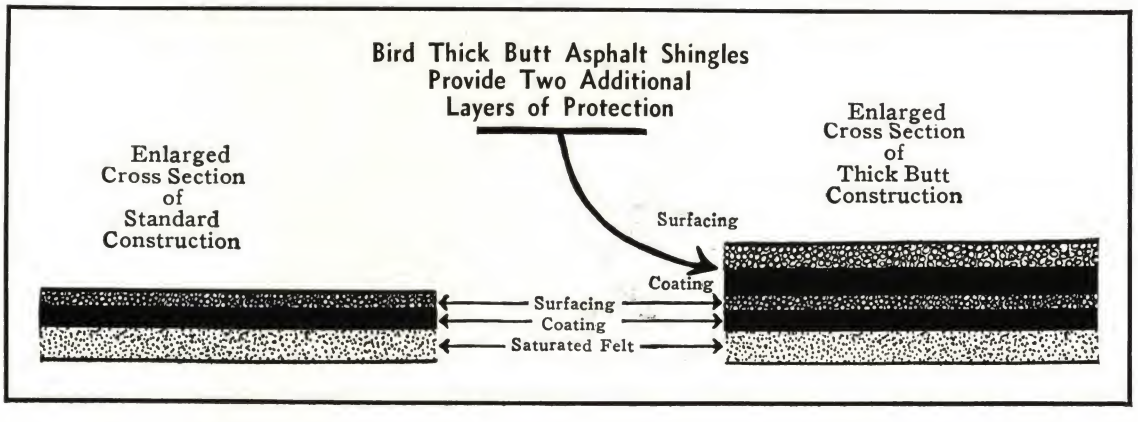
The rough-hewn appearance of the butt and the coarse heavy slate used for surfacing make an unusually beautiful and distinctive roof. One cannot tell it from hand-hewn slate because it *is* slate—slate surfaced with crushed, quarried slate, big thick edges, in appearance like hand-hewn slate. Each shingle made by hand from an asphaltic mastic base. Made to order so the color selected can be just suited to the particular building. The irregular lines, massive appearance, and soft, blending colors make a truly beautiful roof that will not crack or change color.

Section of a Bird Custom Built Shingle Roof

BIRD THICK BUTT ASPHALT SHINGLES

The construction of Bird Thick Butt Shingles gives certain definite advantages as follows:

1. **Added Life**—Because there are double layers of asphalt and slate on the exposed portion.
2. **Added Beauty**—Because the black slate showing through the cut-outs more clearly defines the units of color and gives deeper shadow effects.
3. **Added Weight and Massiveness**—Where most needed.
4. **Added Fire Resistance**—Because of extra slate and asphalt.
5. **Added Thickness of Butt**—Makes butts conform better to roof deck.



CERTAIN-TEED PRODUCTS CORPORATION

ROOFING DIVISION

Manufacturers of Asphalt Shingles and Sidings

GENERAL OFFICES

100 East 42nd Street, NEW YORK, N. Y.

For Sales Offices, see Gypsum Plaster pages
For Our Other Products, see Manufacturers' Index

CERTAIN-TEED AND VULCANITE SHINGLES

Approved by the Fire Underwriters, Inc.

The Certain-teed and Vulcanite shingle lines include every type of asphalt shingle in demand today, from the original and stabilized type of Individual Shingle to our most recent and remarkable roofing development—Speedlay Shingles.

The quality of all Certain-teed and Vulcanite roofings is unquestioned. These shingles, moreover, introduce a variety of rich colors and fascinating blends, and an extensive range of design that meets every modern architectural requirement. They have also been designed with regard to the utmost in protection, beauty, permanency and fire resistance. They are equally suitable for new construction or re-roofing jobs.

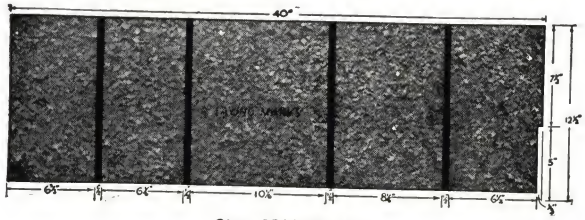
TRADE-MARKS

Certain-teed and Vulcanite Shingles are known for their extra protection and their lasting service. They bring new security, new beauty wherever used. The shingles illustrated here represent roof styles to fit most any home in design, color and economy.

Speedlay Shingles

Speedlay Shingles are exceptionally durable. Their outstanding features are great beauty and speed of laying, resulting in substantial savings in material and workmanship.

Made of the finest materials available, Speedlays provide the home with the very best roofing protection possible. They are approved by the Fire Underwriters, Inc.



Size 12½x40 In.
Standard weight: 200 lb. per square
Jumbo weight: 252 lb. per square

Speedlay Shingles give the appearance of an expensive slate roof at but a fraction of the cost of slate.

The thick butts of Speedlay Shingles cast a deep shadow line across the roof.

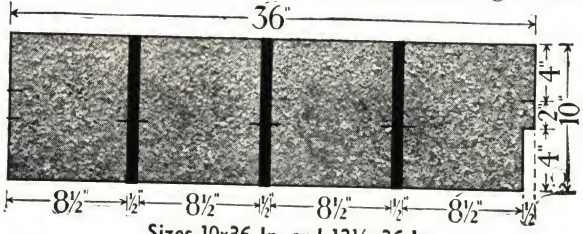
Each shingle, divided into five panels of random widths, has four different, yet harmonizing color blends. The colors on each shingle are shifted to different panel positions, so that no two adjoining shingles are alike in color arrangement. This scientific preassortment is an insurance against failure to obtain the soft blending and proper distribution of color necessary.

Available in four charming blends—Red-cast, Green-cast, Tan-cast and Purple-cast, and thus adaptable for every type of American architecture, as well as the many picturesque styles inherited from other countries.

Four-Width Shingles

Four-Width Strip Shingles are designed to give the actual appearance of individual shingles on the roof. Each strip contains four units, which means quick and economical laying. The self-spacing feature of Four-Widths furnishes a foolproof laying guide.

These sturdy shingles bring extra protection during severe seasons—they do not tend to curl or blow up. They are also highly fire-resistant, adding to the security of the home in every way. Four-Widths provide lasting service, for the quality of these shingles is of the highest, and the soft, attractive colors of the mineral surface are permanent.



Sizes 10x36 In. and 12½x36 In.
Standard weight only:
10x36 in...196 lb. per square 12½x36 in...250 lb. per square

Colors are Red, Green, Blue-black, Brick-red, Jade-green and Color-blend.

Hexagonal Shingles

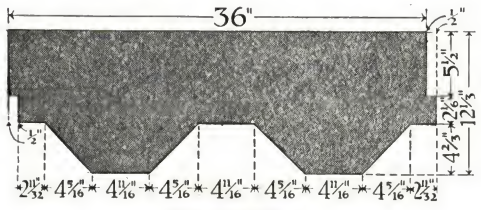
A Style for Every Roof Requirement

Our Hexagonal Shingles are distinctive with their wide range of solid colors, combinations, and harmonious blends.

They meet in every way the modern demand for color on the roof, as well as offering interesting, tile-like effects, with the additional yet very important feature of full protection from beating rains and snows, and from long dry seasons that bake out the life of so many roofs.

There are years of weather-resistance in these shingles.

They are highly fire-resistant, burning embers and falling sparks fall harmlessly on their surface.



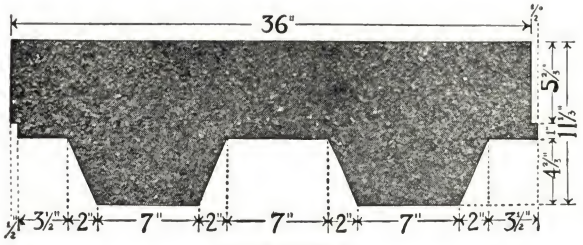
Size 12⅓x36 In.

Furnished in Red, Green, Blue-black, Brick-red, Jade-green, Color-blend, Red-glo, Green-glo and Tan-glo. Also made in Garnet, Verdant, Tawny and Autumn-blends.
Standard weight: 175 lb. per square.
Jumbo weight: 225 lb. per square

Hexagonal Shingles in Beautiful Colorings

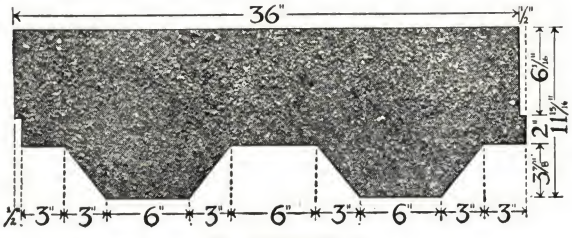
Certain-teed Red-glo, Green-glo and Tan-glo are combinations of two-tone shingles that are assorted at the plant in the proper order for speedy laying on the roof. Red-glo is an artistic blending of four different two-tone shingles with a predominating red tone. Green-glo and Tan-glo carry out green and buff blends in similar fashion as their key tones.

Vulcanite Garnet, Verdant, Tawny and Autumn-blends are combinations of beautiful colorings in each shingle, assorted at the mill in the order in which they are laid on the roof. In Garnet-blend, Indian-red predominates. In Verdant-blend, green controls. Tawny-blend is a buff overtone. Autumn-blend is soft-toned autumnal colors.



Size 11⅓x36 In.

Furnished in Red, Green, Blue-black, Brick-red, Jade-green, Color-blend, Red-glo, Green-glo and Tan-glo. Also made in Garnet, Verdant, Tawny and Autumn-blends.
Standard weight only: 160 lb. per square



Size 11¹⁵⁄₁₆x36 In.

Furnished in Red, Green, Blue-black, Brick-red, Jade-green, Color-blend, Red-glo, Green-glo and Tan-glo. Also made in Garnet, Verdant, Tawny and Autumn-blends.
Standard weight: 211 lb. per square.
Jumbo weight: 272 lb. per square

Cut-out (Square Butt) and Three-tab Jumbo Shingles

Cut-out (Square Butt) Shingles

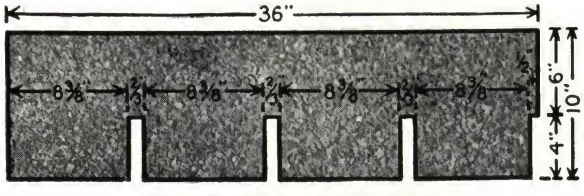
Cut-out Shingles present a simple square-lined effect on the roof that is pleasing with many types of architecture.

Their large covering capacity and their self-spacing feature reduce labor charges.

Three-tab Jumbo Shingles

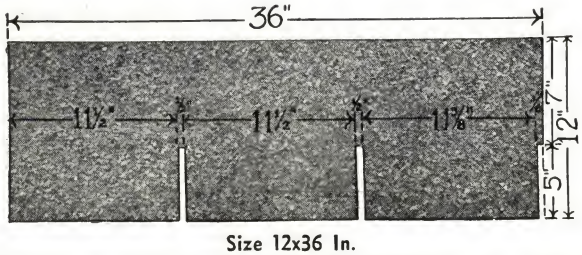
This shingle offers additional protection and a massive or "thick-butt" appearance because of its jumbo weight.

An additional feature is the distinctive appearance of a large individual shingle.



Sizes 10x36 In. and 12½x36 In.

Furnished in Red, Green, Blue-black, Brick-red and Color-blend.
Standard weight only:
10x36 in. 195 lb. per square.
12½x36 in. 250 lb. per square.



Size 12x36 In.

Furnished in Brick-red, Maroon-blend, Green-blend and Jade-green. Blends consisting of five harmonizing tones are preassorted for proper distribution of color on the roof.
Jumbo weight only: 245 lb. per square

Universal Shingles

Universal Shingles build attractive, durable roofs with an interesting "thatched" design. Deep shadow lines, effected by the thick butt ends, emphasize the rich hues and quaint "weave" of the shingle design.

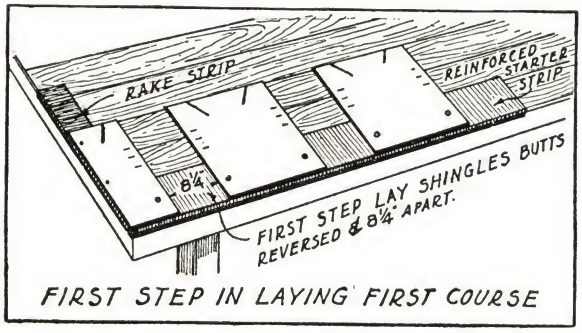
The patented, interlocking device of Universal Shingles provides a weatherproof, watertight surface that will endure unusually severe weather conditions. The butt of every shingle is securely locked in place so that wind cannot raise it. Universal Shingles provide an extra 4-in. side lap which is a distinctive feature of this product.

Universals may be laid to give any of three exposures, depending upon particular conditions of the job in question, and the expense to be involved. Whichever exposure is chosen, 4-in. side laps are provided.

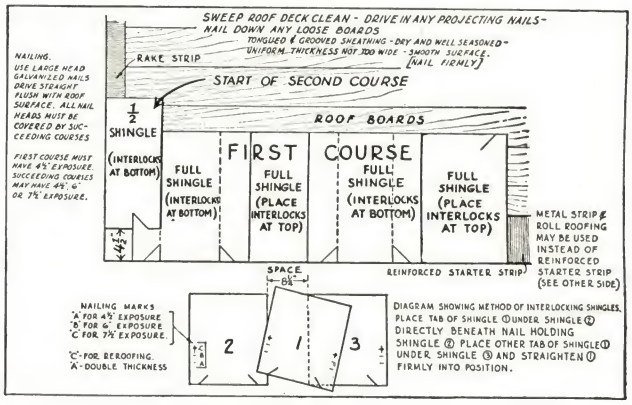
Available in solid colors, but particularly recommended in the four new blends listed. Each of these combine two distinctive but harmonizing colors.

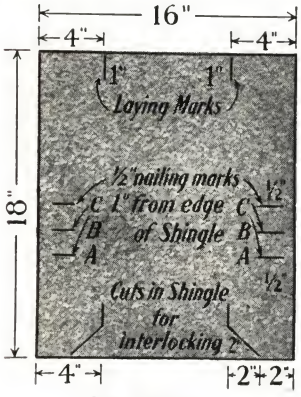
THREE EXPOSURES AVAILABLE

	"C"	"B"	"A"
Headlap .....in.	3	6	9
Exposure .....in.	7½	6	4½
Standard weight per square....lb.	132	165	220
Jumbo weight per square.....lb.	166	208	276



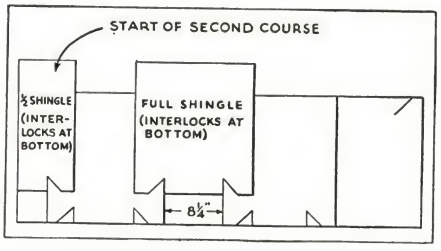
FIRST STEP IN LAYING FIRST COURSE

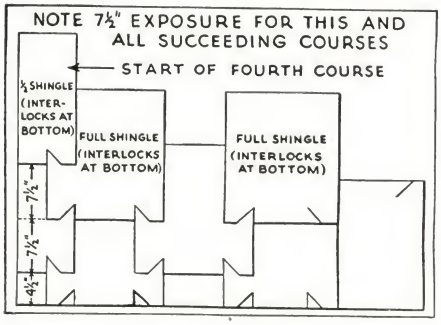




Size 16x18 In.

Colors are Red, Green, Blue-black, Also Rustic-blend, Colonial-blend, Terra-Cotta-blend, Tapestry-blend, Jade-green and Brick-red





Self-spacing Individual Shingles

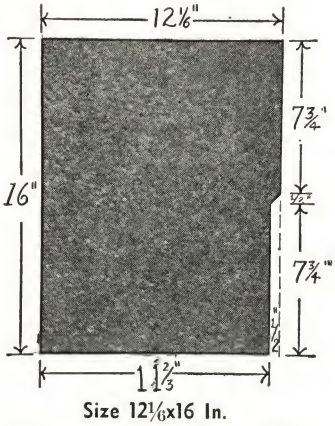
Certain-teed and Vulcanite Self-spacing Individual Shingles conform to the very highest roofing requirements. The simple, regularly spaced course of Individuals is in constant favor. They are suited to most house types, fitting in easily where modern architecture may decree dips, bends and other structural details of a complicated nature.

These shingles are convenient to handle, and their self-spacing feature assures straight, even courses and foolproof laying.

They bring lasting protection against weather and resist fire. The natural colors of the mineral surface are unfading and attractive.

The Self-spacing Individuals are sturdy, weathertight shingles. They may be depended upon for the best roofing service.

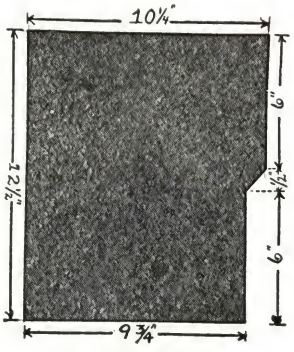
They offer an opportunity for many color designs on the roof because they are available in a number of colors which can be blended to suit the individual taste.



Size 12⅛x16 In.

Colors are Red, Green, Blue-black, Jade-green, Brick-red and Color-blend.

Jumbo weight only: 320 lb. per square



Size 10¼x12½ In.

Colors are Red, Brick-red, Green and Jade-green.

Standard weight only: 240 lb. per square

CERTAIN-TEED SIDINGS AND REINFORCED STRIPS

Brick-tex Siding

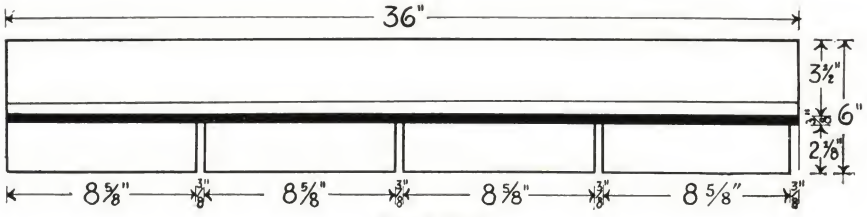
This sturdy, colorful siding exactly duplicates the appearance of brick.

It is made of a high grade felt, saturated with selected asphalts and surfaced with a protective coating of mineral granules. This surface eliminates the cost of staining or painting at any time—a saving that persists year after year.

Brick-tex Siding is specially made for siding work. It will withstand severe weathering and requires no up-keep. It possesses marked fire-resisting qualities and also increases insulation when applied over old wood clapboard walls—a feature that brings year round benefit to any home.

Brick-tex is recommended for renovating homes and other buildings. It is equally suitable for new construction where its economical installation, lasting beauty and other advantages win approval. It is used with excellent results in the construction of bungalows, club houses and other buildings where an attractive exterior is desired at no great upkeep cost.

Brick-tex Applicators have been designed to assure quick, accurate application of Brick-tex Siding.

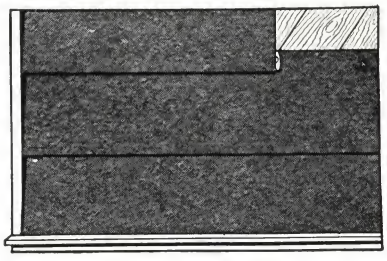


Size 6x36 In.
Colors are Brick-red and Buff
Weight 210 lb. per square

Woodtex Siding

Woodtex looks exactly like wood clapboarding when applied. All the depth, all the interesting shadow lines of real clapboard are present in this remarkable siding. The colors of this mineral surfaced asphalt product are Brick-red, Grey-green, Jade-green and Buff to give the appearance of painted clapboard.

Woodtex Siding eliminates recurring paint bills for the mineral surface does not fade, streak or discolor. The extra durability of this siding likewise eliminates other maintenance charges. It withstands the severest weathering—it is unaffected by climatic changes. Woodtex moreover is resistant to fire—an important advantage over ordinary clapboard.



Size 9 In. x 32 Ft.
Colors are Grey-green, Buff, Jade-green and Brick-red.
Weight 75 lb. per bundle

Woodtex has decided insulating value. When it is applied over old walls it provides a dead air space resulting in an appreciable reduction in fuel consumption. In summer the home is cooler. This siding is suitable for new work or old. Every detail has been carefully worked out to conserve time and labor in application. No special preparation of the old clapboarded surface is needed to apply Woodtex.

Reinforced Strips

To insure the trimness that a properly finished roofing or siding job should reveal, we provide a complete line of corner, starter, gable and ridge strips. These products are made of a 28-gauge galvanized iron base, protected from rust on the underside by a firm layer of asphalt felt.

The exposed surface is mineral surfaced for additional protection against weather and fire.

Certain-teed Reinforced Strips eliminate delaying the job for cutting and matching. They conceal rough corner edges, and secure that sharp, clean-cut line along the gable which is so essential in modern roofs. The permanent, unfading colors of the mineral surface are carefully selected to blend with our shingles or siding materials.

Starter strips, rake strips and ridge strips are available in Red, Green, Blue-black, Color-blend and Jade-green.

Corner strips come in straight Buff and straight Brick-red.

Starter strips, 1¼x7¾ in. x 8 ft.
Rake strips, 1¼x3¼ in. x 8 ft.
Ridge strips, 4¼x4¼ in. x 8 ft.
Corner strips, 2¼x2¼ in. x 8 ft.

THE FLINTKOTE COMPANY

Asphalt Shingles and Roofings

BOSTON, MASS.

NEW YORK, N. Y. CHICAGO, ILL. NEW ORLEANS, LA. CINCINNATI, OHIO ATLANTA, GA. DALLAS, TEX.

Products

SETAB SHINGLES.

ROC-WOOD SHINGLES.

Also all other types of Asphalt Shingles, Roll Roofings, Building Papers, Felts, Waterproofing and Roofing Compounds.

THE FLINTKOTE COMPANY manufactures Asphalt Roofings for every type building. The following pages illustrate those of particular interest to architects as being most suitable for fine homes.

See THE FLINTKOTE COMPANY in Manufacturers' Index for following products:

Built-up Roofing; Emulsified Asphalt Products for waterproofing, dampproofing, mastic floors, protective coatings, etc.

TRADE-MARK

How Obtainable

Dealers throughout the United States carry Flintkote products in stock. Prompt shipments can be made from their stocks or from one of our factories located in East Rutherford, N. J., Chicago Heights, Ill., Cincinnati, Ohio, Atlanta, Ga., and New Orleans, La. Sales representatives in every territory will be glad to supply architects with samples, literature and complete information or these may be secured by writing our nearest office.

FLINTKOTE SETAB SHINGLES

Asphalt Shingles with the Sealed Edges

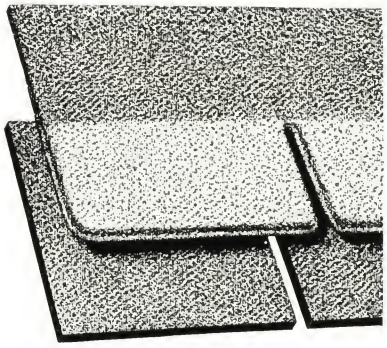
Setab Shingles are the newest of the many important developments made by THE FLINTKOTE COMPANY in the roofing industry in the past quarter century.

The principles of the new construction applied to Setab Shingles are simple, yet fundamental—namely:

(1) That the life of the asphalt shingle depends on the thorough saturation of the felt base with asphalt.

(2) By sealing the saturation from the weather, the life of the shingle can be prolonged immeasurably.

Severe laboratory and field tests have proved conclusively that sealed edge shingles far outlast asphalt shingles with straight cut, unprotected edges.



The Chief Features of Setab Shingles

The chief features of these improved shingles are as follows:

(1) Sealed Edges—Every exposed portion of the shingle is sealed from the weather by an additional envelope or coating of asphalt. This is strengthened and made fire resistant by an additional layer of mineral granules.

(2) Thickness—Setab Shingles are one third thicker than ordinary asphalt shingles. The weight has also been distributed so that it comes where it is needed, at the exposed butts.

(3) Beauty—The rounded edges produce soft deep shadow lines which enhance the beauty of the new distinctive colors.

Color, Size and Weights

Setab Shingles are made in ten different colors and blended combinations as shown on the following pages. They are made in strips 12 ins. by 36 ins., three shingles to a strip and in Giant and Standard weights. Complete data on following pages.

Underwriters' Label

Setabs carry the Class C label of the Underwriters' Laboratories.

ROC-WOOD SHINGLES

Asphalt and Mineral Surfaced Cedar Shingles

Roc-Wood Shingles are a new form of permanently waterproofed and colored cedar shingles. In this shingle are combined three high grade and durable materials as follows:

Western Red Cedar—This is known for its high quality, being straight grain, non-warping, and a wood that has long been noted for its durability and long life.

Asphalt—Known for thousands of years as one of the best waterproofers and preservatives.

Crushed Rock—Coarsely ground natural stones present a fire-resisting wearing surface and give permanent, non-fading color to roof or sidewall.

Description of the Shingles

The shingles are made of Grade A Western Red Cedar 18-in. Eurekas, five shingles equaling 2 ins. at the butt. All shingles are 100% edge grain, strictly free from sap, random widths (4 to 12 ins.) and the entire shingle, with the exception of about 2 ins. at the thin end, coated with a heavy layer of asphalt. Added to the asphalt coating is a coloring and protecting finish, on the top surface, butt and both edges, of coarse, non-fading rock granules. All surfaces exposed to weather or possible decay are therefore protected.

The rock granules form a number of pleasing and attractive colors and blends which may be combined in many artistic ensembles to harmonize with the architectural plan of the home and its surroundings.

Roc-woods form an ideal choice for many types of fine homes, either as roofing or siding.

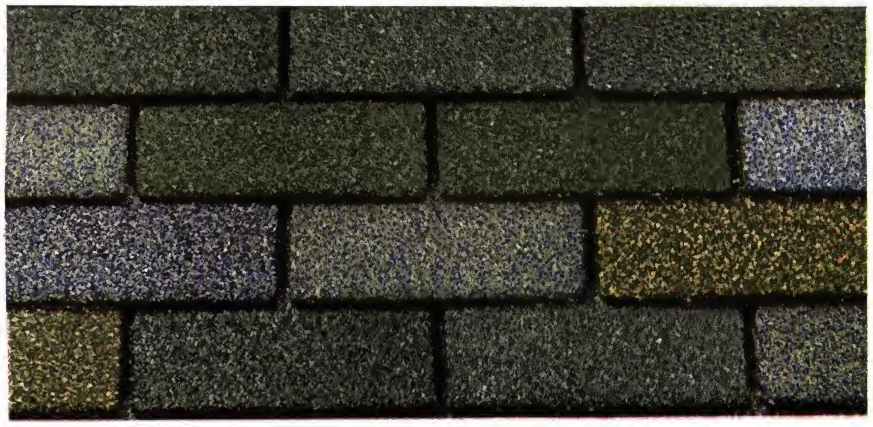
Fire Retarding Qualities

The Underwriters' Laboratories, Inc., have granted the Class C Label to Roc-Woods—an assurance of their fire-resisting qualities. Exhaustive tests have proved Roc-Wood Shingles equal to or better than other Class C roofing materials in this respect.

GIANT SETAB SHINGLES

SETAB

TRADE (PATENTED) MARK



GEORGIAN GREEN

GEORGIAN RED

GEORGIAN GRAY

ON this page are illustrated three blends offered on Giant Setab Shingles. These colors are modern, softly blending combinations. They are produced under the supervision of color and manufacturing experts with the aim of developing colors and blends which are not only harmonious in themselves but which will harmonize with the architectural plan and the color scheme of the home and its natural surroundings. So softly do these colors blend that no spotting occurs on the roof. When laid as they come in the bundle any tendency to patterning is also avoided. Besides the colors shown, Giant Setabs are furnished in Blue-Black and Tile Red.

Sealed edges prolong the life of asphalt shingles indefinitely—give soft rounded edges to the exposed butts enhancing their beauty—add extra thickness, extra weight where the wear comes—increase the beauty and usefulness of the roof.

CONDENSED SPECIFICATION

The roof shall be covered with Flintkote Giant Setab Shingles (color) manufactured by The Flintkote Company and applied according to manufacturers' printed instruction sheets.

DATA

Strips per sq.	80
Weight per sq. approx.	245 lbs.
Nails per strip	4
Size	12″ x 36″
Exposure	5″
Head-lap	2″

Underwriters' Label—Class C

STANDARD SETAB SHINGLES

SETAB

TRADE (PATENTED) MARK

CANYON GREEN

CANYON RED

CANYON GRAY

STANDARD SETAB SHINGLES illustrated below are slightly lighter in weight than Giant Setabs described on the previous page. The colors offered are composed of pleasantly contrasting tones—reds, buffs, grays, blues, greens, blacks and purples. Warm, neutral, and cool combinations permit a choice to fit the architecture and desired color scheme. In addition to the combinations, Standard Setabs are furnished in plain colors, Green and Tile Red.

Setabs have all the advantages of other strip shingles.

Plus—Sealed edges

Plus—Greater thickness

Plus—Extra beauty of color and shadow line.

Plus—Far longer life.

The cost of Setabs is no higher than that of other asphalt shingles which do not possess their distinctive merits.

CONDENSED SPECIFICATION

The roof shall be covered with Flintkote Standard Setab Shingles (color) manufactured by The Flintkote Company and applied according to manufacturers' printed instruction sheets.

DATA

Strips per sq.	80
Weight per sq. approx.	200 lbs.
Nails per strip	4
Size	12″ x 36″
Exposure	5″
Head-Lap	2″

Underwriters' Label—Class C

ROC-WOOD SHINGLES

ROC-WOOD
TRADE (PATENTED) MARK

ROC-WOOD shingles are good shingles made better—good cedar shingles so treated with asphalt and rock granules as to increase their life, beauty, safety and usefulness. Roc-Woods possess all the merits of the Cedar Shingle with several added advantages. Consider these superiorities:

1. **BEAUTY**—seven rich conservative colors make beautiful roofs or sidewalls, which do not fade as the color is that of natural rock. Heavy butts (over ½ inch) create deep shadow lines.

2. **RIGIDITY**—rigid but not brittle, Roc-Woods can be walked on without cracking, will stand extremes of temperature.

3. **INSULATION**—triple thickness over entire roof with a minimum thickness of ¾" of cedar having an insulating value equal to most ½" standard insulating boards.

4. **ECONOMY**—because they are extremely durable Roc-Woods are not injured by weathering; resist fire; need no staining or painting; are quickly and easily applied.

5. **FIRE RESISTING**—take Class C Underwriters' classification.

CONDENSED SPECIFICATION

The roof (walls) shall be covered with Flintkote Roc-Wood Shingles (color) manufactured by The Flintkote Company and applied according to manufacturers' printed instruction sheets and specifications.

DATA

Weight per sq. approx.	315 lbs.
Width—random	4" to 12"
Length	18"
Exposure (roof)	5½"
Underwriters' Label	Class C

A warm combination of English Red, Blue-Black, Silver Gray, and Weathered Brown Roc-Woods.

Coolness is the keynote of this combination of Purple, Weathered Green, Silver Gray, Green, and Blue-Black Roc-Woods.

An intermediate combination consisting of English Red, Purple, Blue-Black and Silver Gray Roc-Woods.

ROC-WOOD SHINGLES

As a siding material Roc-Wood Shingles are ideal. They may be laid in any of the standard styles—regular, ribbon, staggered or random, with beautiful results. The beauty of Roc-Woods is permanent, requiring no staining or painting. The asphalt coating protects the wood from deterioration through weathering.

SILVER GRAY—RIBBON STYLE

When used as siding Roc-Woods are laid 7½ inches to the weather.

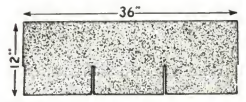
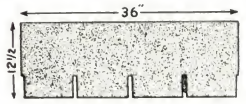
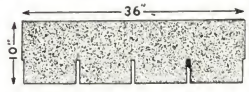
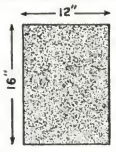
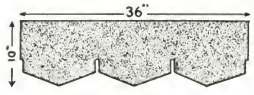
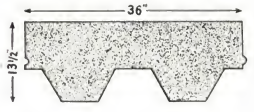
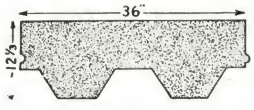
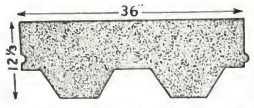
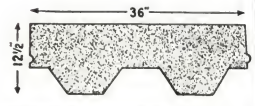
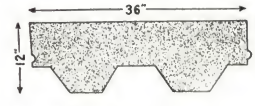
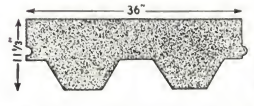
Standard specifications are available upon request.

The fire-resisting qualities of Roc-Woods—attested by the Underwriters' Class C Label—enable architects to specify this shingle in many places where fire ordinances prohibit the use of wood shingles.

WEATHERED GREEN—REGULAR STYLE

WEATHERED BROWN—RANDOM STYLE

ADDITIONAL TYPES AND DATA ON FLINTKOTE ASPHALT SHINGLES

Shapes and sizes	Name	Number of colors	Exposure, in.	Headlap, in.	Underwriters' label, class	Per square		
						Strips or shingles	Bundles	Approx. wt., lb.
	**12-in. Giant Strip**	8	5	2	C	80	3	245
	**12½-in. Strip**	4	4	4½	C	100	3	250
	**10-in. Strip**	5	4	2	C	100	2	196
	**Super Giant Individual**	10	5	6	C	226	4	315
	**Rextab Strips**	11	4	2	C	100	2	180
	**13½-in. Giant Hexagon Strip**	12	5¼	3	C	76	3	230
	**12⅔-in. Giant Hexagon Strip**	14	4⅔	3	C	86	3	230
	**12⅔-in. Special Hexagon Strip**	13	4⅔	3	C	86	2	175
	**12½-in. Double Coverage Hexagon Strip**	11	4	4½	C	100	2	215
	**12-in. Double Coverage Hexagon Strip**	7	4	4	C	100	3	205
	**11⅓-in. Special Hexagon Strip**	16	4⅔	2	C	86	2	157
	Brick Siding	2	3	.....	.....	134	2	185

THE RUBEROID CO.

DIVISIONS

CONTINENTAL ROOFING MILLS | RUBEROID MILLS | ETERNIT | SAFEPACK MILLS | H. F. WATSON MILLS

OFFICES

NEW YORK | CHICAGO | BOSTON (Millis) | ERIE | BALTIMORE | MOBILE

Products

MASSIVE and STANDARD ASPHALT SHINGLES, Unit and Strip.

ASBESTOS CEMENT SHINGLES (Tapered American, Dutch Lap and Hexagonal).

ROLL ROOFINGS, Asphalt and Asbestos (smooth surfaced and mineralized).

BUILDING PAPERS:
"Safe-N-Dry"
"7-Ply"
"Double-Kraft"

WATERPROOFING COMPOUND

Also Roof Coatings and Cements; Pipe Coverings.

For Built-up Roofs see Manufacturers' Index.

A Complete Line of Roof Materials

THE RUBEROID CO. offers you a complete line of roofing materials. Asbestos cement shingles for high grade homes. Asphalt shingles for moderate priced homes. Built-up roofs (asbestos, asphalt or coal tar pitch and felt) for public and industrial buildings.

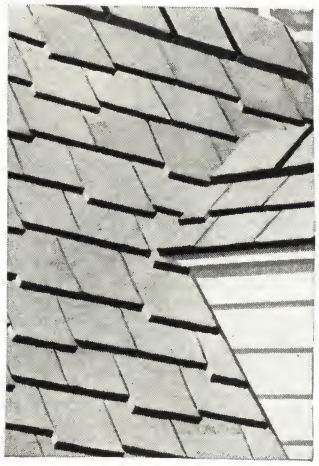
Colorful Shingle Roofs Blended by Experts

To assure architects of roof colors that would do justice to the architectural beauty of each building, Ruberoid engineers and color experts spent months in experiments to perfect correctly blended colors and color combinations.

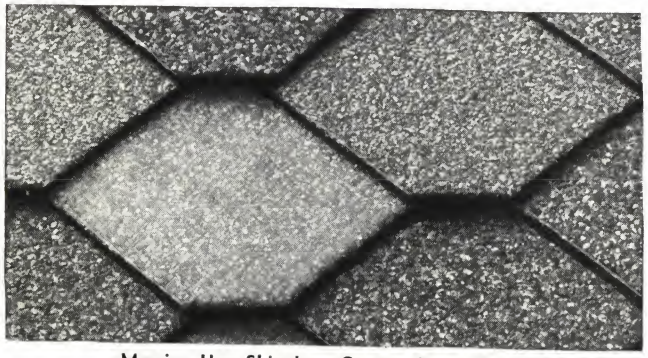
The result is several soft, non-fading shades of warm reds, blended browns, rich purples, bright greens and shaded grays—fine graduation of color tones that express individuality and good taste. These colors may be obtained on both Unit and Strip Shingles in various popular designs.

Charted on the following page you will find a few of the wide selection of weights, thicknesses, and headlap protection that are made to meet varying construction requirements. All are fire-resisting and have the approval of the Board of Underwriters' Laboratories.

Dutch Lap Asbestos Shingle Roof—Blended Colors



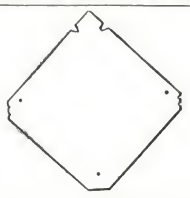
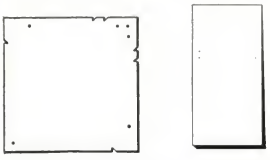
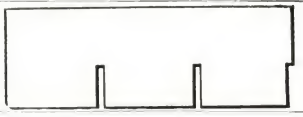
Tapered American Asbestos Shingles—Butts Staggered



Massive Hex Shingles—Copper Green Tone

Square-Tab Strip Shingles—Mixtone

SHINGLE CHART

Name		Size, in.	Pieces per sq.	Approx. wt., lb. per sq.
Asbestos Cement Shingles				
Hexagonal Shingles		16 x 16	87	270
Dutch Laps		16 x 16	92	275
Tapered American		8 x 16	260	500
Asphalt Shingles				
Massive Units		12 x 16	228	312
Massive Hex-strip 13⅛ in.		36 x 13⅛	76	225
Hex-strip 12½ in.		36 x 12½	100	213
Massive Square-tabs 12 in.		36 x 12	80	245

Cement Waterproofing Compound

Cement Waterproofing Compound, when mixed with portland cement, makes leaky cellars or pits bone dry. Its use in stucco entirely eliminates "hair cracking." It differs from other waterproofing compounds in that it does not delay the set or reduce the strength of the mortar.

Building Papers

There is also a complete line of building papers. Included are the well known reenforced papers—"Safe-n-dry" and "7-Ply." For use behind clapboards, stucco shingles, brick veneer and under floors.

"Safe-n-dry," because of the strong woven jute fabric used and the extra reenforcing cords along each edge, has unusual strength. It is almost impossible to tear. Never becomes sticky in summer or brittle in winter. Clean, odorless, waterproof and airtight.

Extra Reenforcing Cords Along Each Edge Make It Practically Impossible to Tear

Rolls 36 in. wide contain 500 sq. ft., weighing 35 lb. per roll.

"Safe-n-dry" is also used for covering concrete floors. Completely eliminates dirt and the use of sand or sawdust. Because of its flexibility and strength, "Safe-n-dry" may be used over and over again. Obtainable in 36, 48, 54, 60, 72 and 84-in. widths.

Where unusual insulating values are required, "7-ply," consisting of three separate sheets of strong kraft paper, two separate layers of asphalt and two separate plies of reenforcing cords (parallel and diagonal), is used. Rolls contain 500 sq. ft., 36 in. wide and weigh 34 lb.

Samples and Literature

Samples and descriptive literature of any product made by THE RUBEROID CO. will gladly be sent upon request. Address nearest office.

COLUMBIAN ENAMELING & STAMPING CO.

ESTABLISHED 1871

BUILDING MATERIALS DIVISION

TERRE HAUTE, IND.

NEW YORK OFFICE: 215 Fourth Avenue

Product

PORCELITE ROOF TILE.

For our page on Wall Tile, see Manufacturers' Index.

Porcelite Roof Tile

An overlapping tile made of corrosion resistant metal of high tensile strength, completely covered with coatings of porcelain enamel.

Uses

Finer residences, clubs, churches, public buildings, gasoline service stations, etc., on all slopes over one-quarter pitch.

Colors

There are no limitations on colors available for special roofs. Attractive, non-fading colors in both semi-mattes and glazed finishes are available. Subdued hues, artistically blended, harmonize perfectly with face brick, stone, or frame structures. For commercial purposes, such as pavilions, service stations, etc., brilliant hues carrying out company colors may be had.

Styles

Two styles of tile are available. One series is deftly embossed to give extra rugged appearance. The other is with smooth exposure.

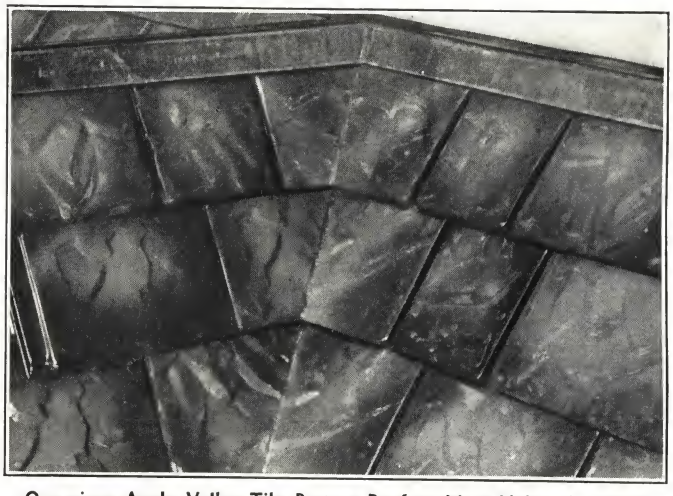
Sizes

Nine graduated sizes, ranging from 7½x9 to 12x12 ins. Butts are ½ to ⅞ in. irregular thickness. Roofs laid using graduated sizes.

Porcelite Roof Tile Harmonize Perfectly with Stone Structure

Application

Decking is completely covered with 30-lb. asphalt felt. Eaves and gables are sealed with copper facings. Beginning at lower right—using tile with widest exposure—roof laid to left, spacing to make valley and gable tile fall in proper positions. Each tile held in place by concealed copper fastenings at all four corners. Valley tile are one piece and are angled. After bottom courses are laid, use graduated size tile to ridge. Ridge sealed with special copper ridge cap, using concealed fastenings.



One-piece Angle Valley Tile Protect Roof at Most Vulnerable Point

Advantages

Watertight—Porcelite Roof Tile are laid over 30-lb. asphalt felt. All tile overlap to insure absolute watertightness. Eaves, gables and ridges closed with 16-oz. copper. One-piece angled valley tile protects roof at most vulnerable point. Each tile secured with heavy concealed copper fastenings at all four corners.

Porcelite Roof Tile Used for Commercial Purpose

Such as gas stations, brilliant hues, carrying out company colors may be had

Non-absorbent—Porcelite Tile remain absolutely non-absorbent. Snow slides and blows off—does not stick or accumulate. Surface remains clean at all times.

Light in Weight—Porcelite Tile weighs only 2⅛ lbs. per sq. ft. laid—including felt. Heavy under structure not necessary.

Permanence of Colors—All colors are non-fading. Subdued tones that lend the appearance of age remain fixed. Brilliant colors that are important in commercial applications remain bright even beyond life of building.

Economical—Prices approximate heavy slate and better grades of tile. All necessary felt, nails, tile, and copper facings furnished. No loss from breakage. Will last a lifetime.

MILCOR STEEL COMPANY

1349 Burnham Street, MILWAUKEE, WIS.

CANTON, OHIO · CHICAGO, ILL. · KANSAS CITY, MO. · LA CROSSE, WIS.

SALES OFFICES

BOSTON, MASS. · DETROIT, MICH. · NEW YORK, N. Y. · ATLANTA, GA. · LOS ANGELES, CALIF. · LITTLE ROCK, ARK. · MINNEAPOLIS, MINN.

Products

"TITELOCK" METAL SPANISH and AMERICAN TILE.
RAIN CARRYING EQUIPMENT.
Also Metal Roofing of Various Types; Metal Shingle and Slate; Ventilators and Skylights; Marquises; Architectural Ornaments.

MILCOR
TRADE-MARK
(Registered)

For our pages on Steel Basement Windows and Sheet Metal Products, Metal Lath, Corner Beads, Expansion Casings, etc., see Manufacturers' Index.

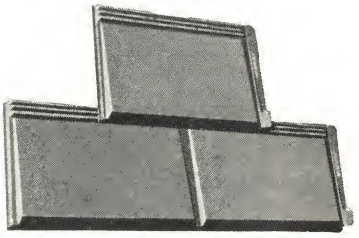
Metal Tile Roofing

Metal Spanish Tile

For those roofs on which metal is demanded and an attractive pattern highly desirable either Milcor "Spanish" or "American" Metal Tile is suggested. The type of roof will determine which is to be used.

Metal Spanish Tile—This metal tile simulates the "Spanish" roof effect and is handsome either painted or in copper. It is economical since its light weight requires no heavy supporting structure and since it requires no high priced labor for laying. Detailed instructions and working drawings are given in the Milcor Architectural Sheet Metal Guide.

Metal American Tile—The simplicity of the "American" style of tile, its appearance of weight and age made by the deep shadows at the butts and in the channels between tile, is very attractive and gives one an impression of great structural weight and value. The "Titelock" joint is effective against rain, snow or storm. Detailed instructions and working drawings are given in the Milcor Architectural Sheet Metal Guide.



Metal American Tile

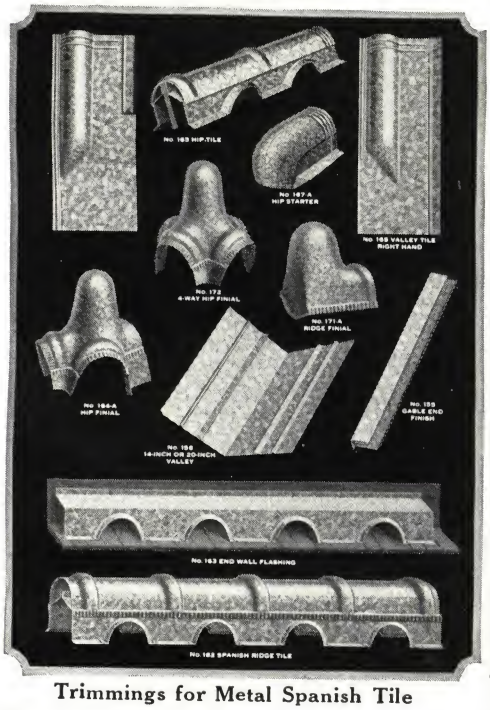
MECHANICAL SPECIFICATIONS MILCOR "TITELOCK" SPANISH METAL TILE

Mechanical specifications	Individual Spanish field tile	Individual closed-end Spanish starter tile	Twin Spanish field tile	Twin closed-end Spanish starter tile
Actual size ..... in.	10 x14	10 x14	18½x14	18½x14
Coverage size ..... in.	8½x11¾	8½x11¾	17 x11¾	17 x11¾
Number of units per square...	144	144	72	72
Weights per square: lb.				
IC—painted	110	125	105	120
IX—painted	135	150	130	140
IC—galvanized after formed...	130	145	*	*
IX—galvanized after formed...	155	170	*	*
Cut from galvanized sheets....	*	*	115	130
26-ga. armco painted	160	175		
26-ga. armco galv. after	180	195		
14-oz. copper	175	190	*	*

*Not furnished in these grades.

MECHANICAL SPECIFICATIONS MILCOR METAL AMERICAN TILE

	Actual size in.	Coverage size in.	Weights per square: lb. IX painted red or green	IX galv. after formed	26 Ga. armco painted	26 ga. armco galv. after formed	Cut from 14-oz. anaconda copper	Number of American tile per square
American field tile..	14x10	12x8	105	115	120	130	130	148
American starter tile	7x10	6x8	115	125	130	140	140	296

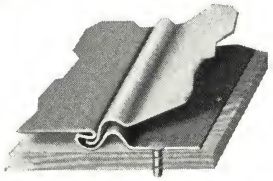


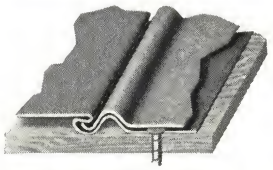
Trimmings for Metal Spanish Tile

The Milcor "Titelock" Feature

Any mechanic can lay "Titelock" Tile. When laid there is no possibility of any joints separating. The "Titelock" feature eliminates the use of solder.

Hook the flange into the groove of tile preceding. As it is laid flat, the tile locks tightly. All nail holes and nails are covered by the overlapping tile. Absolutely leakproof.



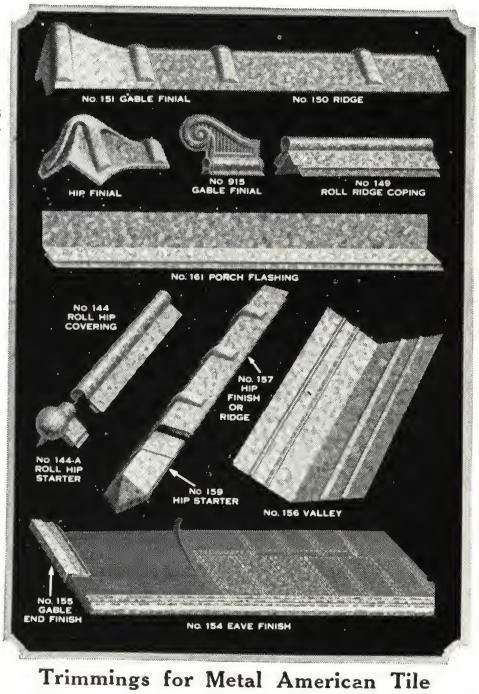


Milcor "Twodrain" Channel Roofing

The "Twodrain" Channel feature of this new Milcor roofing seals the roof against leaks in any weather. Seepage, or water driven over the first short V-crimp, drains off through the first drain channel. Next comes a high crimp with another drain channel on the other side. This second drain channel is the extra precaution positively insuring against leakage in any weather.

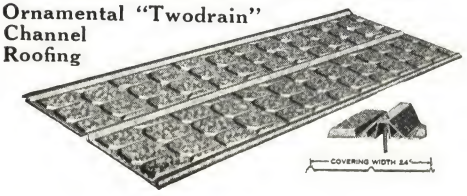
"Twodrain" Channel Roofing is made in two types—*Plain* and *Ornamental*. The *Ornamental* has a stamped shingle design giving a fine appearance to roofs of schools, churches, etc. Both types may be used for either roofing or siding.

"Twodrain" Channel Roofing is made in 3-V style only, with V formations on 12 in. centers. Each sheet has a covering width of 24 in. Made from 29, 28 and 26 gauge galvanized sheet steel.

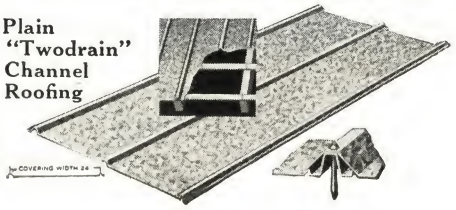


Trimmings for Metal American Tile

Ornamental "Twodrain" Channel Roofing



Plain "Twodrain" Channel Roofing



ALUMINUM COMPANY OF AMERICA

Member of The Producers' Council

Manufacturers of Alcoa Aluminum Roofing

2444 Oliver Building, PITTSBURGH, PA.

Products

ALCOA "TOP DOWN" ALUMINUM SHINGLES and ACCESSORIES, including Ridge Covers, Hip Covers, Side Finishers, Eave Finishers, Valleys, Flashings, etc., and Aluminum Nails for applying.

ALCOA ALUMINUM HANGING GUTTER (Eave Trough) and Conductor Pipe, together with Miters, Elbows, Hangers, and other required fittings.

ALCOA ALUMINUM FLAT SHEET for batten seam, standing seam and other standard or special forms of sheet metal roofing; and for box gutters, moulded gutters, flashings, skylights, etc.; Aluminum Accessories for applying this material are also furnished.

ALCOA ALUMINUM CORRUGATED SHEET for Roofing and Siding in standard 2½x¾ in. and 1¼x⅜ in. corrugation; special corrugations on order.

For our pages on Aluminum and its Alloys, and Paint, see Manufacturers' Index.

Advantages of Alcoa Aluminum Roofing

Will Not Rust—Alcoa Aluminum is a non-rusting metal. It is resistant to the sulphurous fumes of smoke and other corrosive agents found in the atmosphere.

Will Not Stain—Alcoa Aluminum forms no colored salts. Consequently, it will not discolor adjoining materials from drip or splash of watershed.

Durable—The rigidity and strength of Alcoa Aluminum roofing minimize possible damage from snow, hail, ice, falling bricks, tree branches, etc. Alcoa Aluminum retains its strength, rigidity, toughness, and ductility in all kinds of weather.

Light Weight—Alcoa Aluminum weighs only one-third as much as other metals commonly used for roofing. "Top Down" shingles, when applied, weigh approximately 60 lb. per square (100 sq. ft.). This lightens and reduces the cost of supporting members.

Easily Worked—Because of its light weight, Alcoa Aluminum roofing is easy to handle on the job. It is readily cut and worked without cracking or breaking.

Weathertight—"Top Down" shingles are made weathertight on all four edges by positive interlocking mechanical joints with complete provision for expansion and contraction. Where weatherproofing of corrugated sheet joints is necessary, asphaltic base cements are recommended. The uniformity of the corrugations assists materially in weatherproofing.

Costs and Scrap Value—When figuring the cost of Alcoa Aluminum roofing, the ease of application, size of supporting members, freedom from rust and discoloration, and the long life of the material must be considered. It is generally safe to assume that the scrap value of an Alcoa Aluminum roof, after many years of service, will be about one-half of its original value.

Finishes and Colors

The standard finish for flat and corrugated roofing sheet is gray plate. However, polished and oxide finishes are available.

Hanging gutter, conductor pipe, fittings, and flashings are furnished in natural aluminum or oxide finishes.

"Top Down" Shingles are available in red or green baked enamel finish (other colors on special order) and oxide finish.

All of the above colors are available in four different shingle designs: plain, ribbed, and two texture designs.

Gauges and Weights

Alcoa Aluminum roofing is supplied in B&S gauge thicknesses. For approximately the same thickness, B&S gauge runs two numbers lower than U. S. gauge.

ALUMINUM SHEET THICKNESSES GENERALLY RECOMMENDED FOR ROOFING

B&S gauge	Thickness	Weight per sq. ft.
20	0.0320 in.	0.450 lb.
18	0.0403 in.	0.568 lb.
16	0.0508 in.	0.716 lb.
14	0.0641 in.	0.903 lb.

Fabrication and Application

For flat or corrugated sheet roofing and siding, fabrication and application are practically the same as for other metals, except that, where soldering is required for other metals, welding is necessary for aluminum.

An instructive booklet, "The Welding of Aluminum," will be sent upon request to anyone interested in the process.

ALUMINUM COMPANY OF AMERICA will also gladly furnish specifications, estimates, and any other data necessary for any roofing job.

Alcoa "Top Down" Shingles—Alcoa "Top Down" Aluminum shingles possess the unique advantage of being laid from the top, down. Work starts at the ridge and finishes at the eaves. This eliminates the necessity of working over any finished part of the roof.

For one square (100 sq. ft.) of completed roof surface, 112½ pieces 8x16 in. or 75 pieces 8x24 in. "Top Down" shingles are required.

Specifications

Manufacturers' complete specifications and standard application instructions will be sent on request.

Holy Ghost Church, Milwaukee, Wis.
ESCHWEILER & ESCHWEILER, Architects

Alcoa Aluminum sheet batten seam roofing, gutters, leaders, and conductor heads of No. 20 B&S gray plate sheet. Alcoa "Top Down" Aluminum shingles, hanging gutters, and leaders used on garage

Applying Alcoa "Top Down" Aluminum Shingles

Alcoa "Top Down" Aluminum shingles, texture design, natural aluminum finish, were applied with ease on the roof of this tower, 38 stories above the street

BUCKINGHAM-VIRGINIA SLATE CORPORATION

1103 East Main Street, RICHMOND, VA.
NEW YORK OFFICE, 101 Park Avenue
QUARRIES AND SHIPPING POINT: ARVONIA, VA.
Member of National Slate Association

Products of Guaranteed Quality

BLUE-BLACK and OXFORD-GREY UNFADING ROOFING SLATE—Architectural and Commercial. GARDEN WALK FLAGGING.

Buckingham-Virginia slate has unequalled texture and durability with the largest range of lights and shadows of any Blue-Black or Oxford-Grey slate manufactured in the United States. This slate particularly commends itself to Architects in that it provides the widest range of texture and the highest quality at a reasonable cost.

Specify BUCKINGHAM-VIRGINIA "BLUE-BLACK" or "OXFORD-GREY"—requiring certificate of guaranteed quality—to prevent substitution of inferior slate.

The Buckingham-Virginia slate district has the largest production of the highest quality Blue-Black and Oxford-Grey Unfading roofing slate in the United States which assures prompt shipment of all orders.

Roof Layout will be furnished promptly on receipt of plans.

Sample Board on display at Architects' Samples Bureau, 101 Park Avenue, New York City.

Awards of Merit

First Award: London 1857
Gold Medal: Philadelphia 1876
Gold Medal: Chicago 1893
Gold Medal: St. Louis 1904

Test Reports

As a matter of interest, we quote from report of Mr. Robt. Notvest, of Indianapolis, Ind., who was Consulting Engineer for National Slate Association in charge of Research Laboratories from 1921-1926:

"Buckingham-Virginia" is a Mica, not a Clay Slate.

"Buckingham-Virginia" is an *unfading* slate.

"Buckingham-Virginia" has outstanding *texture* and *toughness* not equalled by any other slate in the United States.

In absorption test—"Buckingham-Virginia" slate stands much higher than any other slate in the country.

"Buckingham-Virginia" will withstand without cracking higher temperatures and sudden changes of the same better than any other slate quarried in the United States.

"Buckingham-Virginia" is unaffected by the ravages of the weather.

The quiet dignified Blue-Black color of "Buckingham-Virginia" is permanent. No fading under the weather, no dirty and unsightly rust streak through the decomposition of iron pyrites.

"Buckingham-Virginia", a Mica slate free from lime and magnesium, will not be injured through years of exposure to chemical fumes, soft coal or oil smoke in industrial or other districts.

Home of William Byrd II, "Westover-on-the-James," Roofed with Buckingham Architectural Slate
Considered by many the finest example of existing architecture of Colonial Virginia

Buckingham Slate Roofs Cover Nation Wide Projects

College of William and Mary, Williamsburg, Va.
Eno Memorial Hall Library, Simsbury, Conn.
Governor's Mansion, Richmond, Va.
Harvard School of Business Administration, Cambridge, Mass.
Klise Memorial Chapel, Grand Rapids, Mich.
McKinley High School, Washington, D. C.
New York Geological Library, New York, N. Y.
Roosevelt High School, Washington, D. C.
Tammany Hall, New York, N. Y.
The George Wythe House, Williamsburg, Va.
The University of Rochester, Rochester, N. Y.
University of North Carolina, Chapel Hill, N. C.
University of Virginia, Charlottesville, Va.
Virginia Polytechnic Institute, Blacksburg, Va.
Forney Johnston Residence, Birmingham, Ala.
Glen Phelps Residence, Riverside, Conn.
Rev. G. Freeland Peter Residence, Washington, D. C.
Eli Lilly Residence, Broadripple, Ind.
Col. Haniford McNider, Mason City, Iowa.
H. Brown Potter Residence, Louisville, Ky.
Ellen B. Laight Residence, Rockport, Mass.
Edsel Ford Residence, Seal Harbor, Me.
Geo. B. Clifford Residence, Minneapolis, Minn.
H. H. Rogers Estate, Southampton, L. I., N. Y.
Aldrich Residence, Wheatley, L. I., N. Y.
Farnsworth Residence, Pelham, N. Y.
Barnes Newbury Residence, Narragansett, R. I.

BANGOR SLATE ASSOCIATION

BANGOR, PA.

MEMBER COMPANIES

AULD & CONGER CO., Cleveland, Ohio
BANGOR IDEAL SLATE MINING CO., Bangor, Pa.
BANGOR QUARRY COMPANY, Bangor, Pa.
BANGOR WASHINGTON SLATE CO., Bangor, Pa.
BANGORVEIN SLATE CO., Bangor, Pa.
COLUMBIA BANGOR SLATE CO., Bangor, Pa.
THOS. DITCHETT ESTATE, Bangor, Pa.
EAST BANGOR CONSOLIDATED SLATE CO., East Bangor, Pa.
NORTH BANGOR SLATE CO., Bangor, Pa.
OLD BANGOR SLATE CO., Bangor, Pa.
VENDOR SLATE CO., Easton, Pa.

Product

The members of the BANGOR SLATE ASSOCIATION are the Sole Producers of GENUINE BANGOR ROOFING SLATE—a strong, non-fading rock of over 70 years continuous production. Permanent in color and with a radius of flexibility indicating the highest degree of strength and wearing qualities possible in natural rock formations. Mill Stock for structural purposes, Flagstone, and Blackboards are also available in Genuine Bangor quality.

Look for Label Bearing This Trade-mark on All Shipments of Genuine Bangor Slate

Purposes of the Association

The BANGOR SLATE ASSOCIATION is a non-profit membership corporation formed, (1) to bring about a wider appreciation of the real value of slate as a roofing material, (2) to invite the co-operation of architects, contractors, and roofers in formulating and disseminating information regarding the most advantageous methods of application, (3) to protect the high reputation and standards of Genuine Bangor Slate. To accomplish these objects, the Association is constantly furnishing to the building world the detailed information desired regarding Genuine Bangor Slate.

To insure that the architect obtains slate of a uniform grade and quality, an inspection service is maintained to inspect and label with the trade-mark all Genuine Bangor Slate. In addition, a certificate of identification and grade is furnished to each purchaser of Genuine Bangor Slate.

Small Size of Facsimile Certificate Issued with Every Car of Genuine Bangor Slate

Service

The Association will welcome the opportunity to co-operate with the architect, contractor, and roofer on all roofing problems that may come up.

Label and Certificate Protection

All Genuine Bangor Slate bears the trade-mark of the Association and each shipment is accompanied by a certificate of identification. Genuine Bangor Slate is guaranteed by the Association to conform to rigid specifications for material and workmanship. To insure the protection afforded by this guarantee, architects should insist on only slate bearing the Genuine Bangor label and compel the contractor to furnish a certificate.

This certificate should be checked by the architect, as substitutions of other slate for Genuine Bangor Roofing Slate are common occurrences.

Selections of Genuine Bangor Slate

No. 1 Clear—Uniform throughout as to color and texture, and free from knots and knurls that in any way interfere with the safe conveyance or the laying of the slate on the roof. Entirely clear stock. The customary tolerance to be allowed for thickness. Corners to be square.

No. 1 Ribbon—Similar in all respects to No. 1 Clear stock except that one or more ribbons of darker material may cross the slate in such manner that when laid with the regulation 3-in. lap, the ribbons shall not be exposed to the weather. Fracture tests prove that the ribbon is stronger than the slate.

To Specify Genuine Bangor Slate

Architects who desire Genuine Bangor Slate should specify only by the full name "Genuine Bangor Slate, with labels and certificate of BANGOR SLATE ASSOCIATION." This wording will protect the architect and his client against the substitution of inferior materials.

Stock Sizes Available at All Times

Due to the vast production of the Bangor Quarries, a complete stock of the sizes given in table and in standard thickness of approximately $\frac{3}{16}$ in. is available at all times. All shipments are made from quarries at Bangor or East Bangor, Pa. Heavier slate are manufactured promptly to order.

STANDARD SIZE SLATE AVAILABLE AT ALL TIMES

Type	Sizes are in inches, length by width in the order given						
No. 1 Clear.....	24x14	22x12	20x12	18x12	16x12	14x10	12x10
	24x12	22x11	20x10	18x10	16x10	14x 8	12x 8
	.....	.....	.....	18x 9	16x 9	14x 7	12x 7
	.....	.....	.....	.....	16x 8	.....	12x 6
No. 1 Ribbon.....	24x12	22x12	20x12	18x12	16x12	14x10	12x 8
	.....	22x11	20x10	18x10	16x10	14x 8	.....
	.....	.....	.....	18x 9	16x 8	14x 7	.....

QUANTITIES REQUIRED AND WEIGHT PER SQUARE FOR VARIOUS SIZES

Size of slate, in.	Weight per square, lb.	Number per square	Exposure with 3-in. lap, in.	Nails per square 3d copper, lb. and oz.	Size of slate, in.	Weight per square, lb.	Number per square	Exposure with 3-in. lap, in.	Nails per square 3d copper, lb. and oz.
24x14	641	98	10½	1–4	16x12	692	185	6½	2–4
24x12	641	115	10½	1–7	16x10	692	222	6½	2–12
22x12	652	127	9½	1–9	16x 9	692	247	6½	3–1
22x11	652	138	9½	1–12	14x10	716	262	5½	3–3
20x12	664	142	8½	1–12	14x 8	716	328	5½	4–0
20x10	664	170	8½	2–2	14x 7	716	374	5½	4–10
18x12	674	160	7½	1–15	12x 8	750	400	4½	4–15
18x10	674	192	7½	2–6	12x 7	750	457	4½	5–10
18x 9	674	214	7½	2–9	12x 6	750	534	4½	6–9
16x 8	692	277	6½	3–3					

Standard Specification "A"

Preparation of Roof—Before proceeding with roofing work of any nature whatsoever, the roofer shall examine all roof surfaces so intended for the application of slate, and report for correction any and all defects therein which will interfere with the execution of his work and guarantee thereof.

Cant Strip—Carpenter contractor shall provide in place at all eaves a beveled cant strip 1 in. in thickness at the lower side and 2 in. or more in breadth, so beveled that the slate will rest evenly thereon.

Paper—Cover all roof surfaces so intended for slate application with an approved brand of 30-lb. asphalt impregnated roofing felt. This felt shall be laid to shed water and accordingly lapped 4 in. on the rafter and 12 in. where vertical joints are occasioned. It must be in perfect, undamaged condition and free from holes when slate is applied.

Cement—Within 1 ft. of dormers, vertical walls, valleys, ridges, hips and similar places, slate shall be laid in an approved brand of elastic cement approximating the general color of the slate. (Within 2 ft. of the eaves where parapet walls require the use of a copper cricket, slate shall be laid in cement as above indicated.) *Note if required.*

Nails—Each slate shall be secured with two copper slating nails of sufficient length to penetrate the roof sheathing 1 in. in every instance. In no case shall nails be driven through (copper) flashings except when applying same.

Slate—Cover all properly felted roof surfaces as above detailed with Genuine Bangor Certificate Roofing Slate (size) [No. 1 Clear] [No. 1 Ribbon] identified with certificate and labels of the BANGOR SLATE ASSOCIATION. (*Note: Architects should insert size and grade here.*)

Manner of Laying—All slates shall be laid in proper weathertight manner with well broken joints and preserving a headlap of at least 3 in. above the second course below in all instances.

Valleys—All valleys shall be closed type and shall be properly slip flashed in each and every course. (*Where open valleys are required see foot note below.)* At valley intersections, all courses throughout the entire roof shall meet.

Ridges—Ridges shall be of Boston Type and laid horizontally in such a manner as to form a regular course of slate. There shall be no demarcation between the last course of slate and the ridge course. The holes in the ridge slate shall be punched to intersect the joints of the next course below. It is understood that the top course of slate shall be laid in elastic cement and so arranged that a first class waterproof job will result. In no instance shall the cement be so applied that it will run over face of the slate.

Diagram Showing Method of Laying Boston Ridge

Hips—All hips shall be applied in the Boston Style as per sketches supplied by the BANGOR SLATE ASSOCIATION, Bangor, Pa.

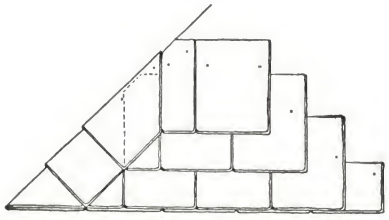


Diagram Showing Method of Laying Boston Hip

Flashings—Flashings on dormer cheeks and where the roof meets other vertical surfaces, shall be of sufficient size to lap 4 in. under the next above and extend 8 in. under slate on each side.

Cleaning Up and Guarantee—The contractor shall guarantee his work for a period of at least ... years, replacing or repairing any broken slates or leaks until the end of his guarantee period. Any stains of any nature whatsoever, excluding stains or dirt streaks caused by other contractors at time of building, shall be removed before acceptance of his work will be granted.

It is not the intent or purpose of the above guarantee to require the roofer to replace slates or repair leaks caused by other contractors or by causes beyond his reasonable control. This guarantee refers to faulty slate or workmanship which will not be allowed in connection with the application of this roof.

Note: For abbreviation purposes the following form of specification may be used in place of above: "All materials and labor in connection with slate work shall be furnished and performed in strict compliance with Specification 'A' of the BANGOR SLATE ASSOCIATION, Bangor, Pa. The slate shall be Genuine Bangor Certificate Slate (grade and size) with labels and certificate of the Bangor Slate Association."

Note: For the sheet metal work we recommend the specifications published by the Copper and Brass Research Association.

Slate on Flat Surfaces

Genuine Bangor Slate for this purpose are applied in small sizes, butt to butt over standard prepared roof surfaces in place of slag or gravel as per specifications issued by the manufacturers of prepared roofing materials.

Copies of such specifications will be mailed upon request.

THE CHAPMAN SLATE COMPANY

Sole Producers of Wm. Chapman Hardvein Roofing Slate

BETHLEHEM, PA.

Member of the National Slate Association

Products

Wm. Chapman Hardvein Blue-Gray Roofing Slate, in standard thickness, furnished in smooth or rugged texture. Complete stock of all sizes maintained for immediate shipment.

Chapman Texture Slate: A rugged texture blue-gray roofing slate in graduated lengths and intermixed thicknesses. A large stock of heavier than standard slate is carried at all times.

Flagging in natural cleft surface with trimmed or natural edges.

Stepping Stones for garden walks.

Slate Fence Posts for rail fences.

General Description

Wm. Chapman, produced in the Northampton-Lehigh districts of Pennsylvania, is a strong, tough, close grained practically non-absorbent, slow-weathering blue gray slate.

It is striated with hard siliceous veins which impart a beautiful sheen and texture. A Chapman roof is dignified, rugged, unfading and symbolic of endless durability—a worthy covering for the finest architectural efforts.

Operated by the Chapman family for more than eighty years—an American record for continuous production made possible only through fine quality of product and satisfied customers.

Government and State Work

Wm. Chapman Hardvein Slate will meet the most rigid requirements for U. S. Government and State projects requiring the finest quality of blue-gray roofing slate. Results of physical tests and chemical analyses from recognized testing laboratories will be furnished upon request.

How to Specify

Chapman Texture Slate may be applied under any standard slate roof specification. As a condensed form we suggest the following:

Cover all roof surfaces properly felted in accordance with standard specifications, with Chapman Texture Slate as furnished by The Chapman Slate Company, Bethlehem, Pa., graduated in thickness from ..... to ..... inches in random widths. (If a specially prepared layout is to be furnished by our architectural department, this should be stated.)

Wm. Chapman Slate Label

By request of architects, 2% of each shipment bears this label.

References

Herewith are listed a few of the buildings covered with Wm. Chapman Slate roofs:

Roman Catholic Cathedral, New York, N. Y.
Brooklyn Bridge Buildings, New York, N. Y.
Central Park Buildings, New York, N. Y.
United States Military Academy, West Point, N. Y.
Saint Barnaby's P. E. Church, Philadelphia, Pa.
State Capitol, Albany, N. Y.
Bethlehem Steel Company, Bethlehem, Pa.
United States Naval Base, Hampton Roads, Va.
U. S. Veterans' Bureau Hospital, Northport, L. I., N. Y.
Men's Dormitory, St. Lawrence University, Canton, N. Y.
Fort Humphreys, Va.
Pennsylvania State Hospital, Norristown, Pa.
Cresson State Sanitarium, Cresson, Pa.
University of Maryland, College Park, Md.

Residence of Arthur H. Hull, Harrisburg, Pa.

Clayton J. Lappley, Architect
Chapman Texture Slate 16 in. x Random 3/16 to 1/2 in.

THE ELHIDE COMPANY

JOHN C. RUNKLE, President

Elhide Monson Maine Roofing Slate

CAMBRIDGE, MASS.

QUARRY AT MONSON, ME.

NEW YORK OFFICE, 122 East 42nd Street

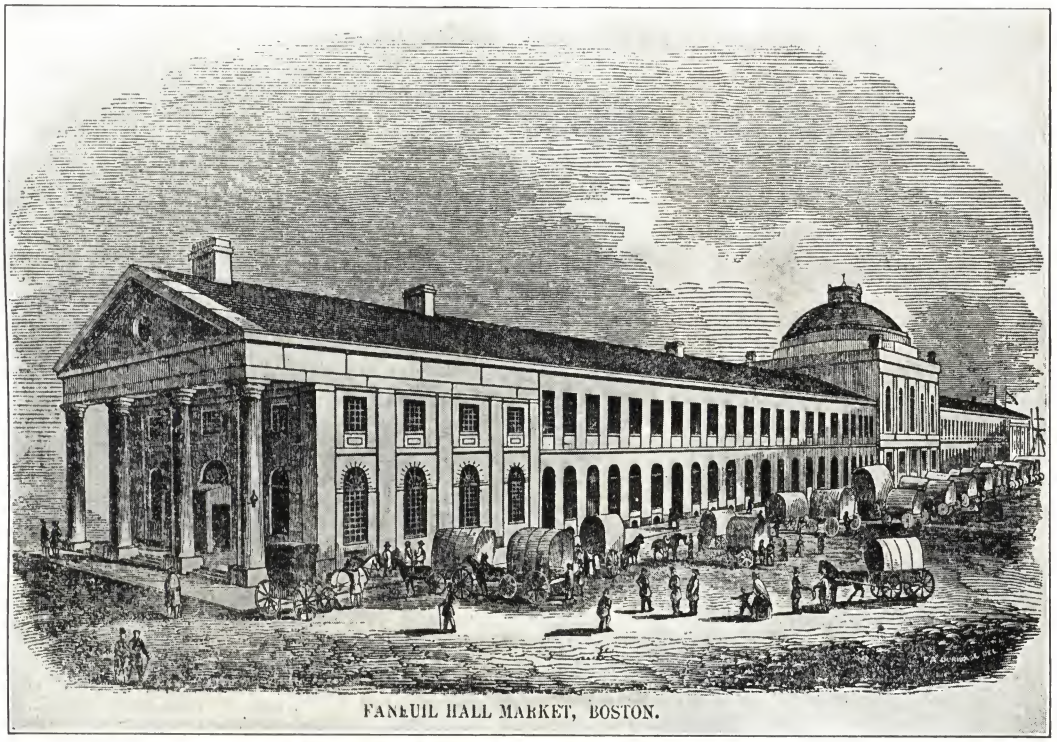
Products

ELHIDE MONSON MAINE ROOFING SLATE.

For Elhide Hand-Split Cedar Shingles and Elhide Hand-Split Cedar Fencing, see Manufacturers' Index.

Condensed Specification

Cover all roof surfaces properly felted in accordance with standard specifications, with Elhide Monson Maine Roofing Slate, ... in. long by ..... in. wide, exposed ..... in. to the weather, as furnished by THE ELHIDE COMPANY, 130 Sixth Street, Cambridge, Mass.



FANEUIL HALL MARKET, BOSTON.

Reroofed with Elhide Monson Maine Roofing Slate

Elhide Monson Maine Roofing Slate

Elhide Monson Maine Roofing Slate is a genuine Maine-quarried slate. It is famous throughout the country for its extreme durability, which is due to its resistance to the absorption of moisture, and to its unusual hardness and toughness. It is this remarkable durability, together with its enduring color, which is unchanged by exposure, that makes Elhide Monson Maine Slate an ideal roofing material.

It is quite customary when removing Monson Slate from the roof of an old building that has outlived its usefulness, to use the slate again on a new project. Samples of old slate gladly furnished on request.

Elhide Monson Maine Roofing Slate costs but slightly more than many inferior slates. As the cost of application is the same in any case, it is sound economy to secure the advantages of long-life and conservative beauty inherent in genuine Monson Maine Slate.

Color

Elhide Monson Maine Roofing Slate is very dark, bluish gray (gunmetal) in color, and is *strictly non-fading.* Its lustrous surface is characteristic of a genuine Monson Maine Slate.

Stock

We carry on hand available for prompt shipment at all times a good supply of all sizes from 20 in. long by 12 in. wide for larger roofs; down to 12 in. long by 6 in. wide which are particularly suitable and attractive for small residence roofs.

Dimensions

The standard commercial thickness of Elhide Monson Maine Roofing Slate averages $\frac{7}{32}$ in. Thicknesses of full ¼ in. or more are furnished on order.

Nailholes

Each slate is punched and countersunk to receive two roofing nails, so spaced as to allow a full 3-in. head-lap.

Architectural Service

THE ELHIDE COMPANY is prepared to co-operate with architects in the design or specification of Elhide Monson Maine Slate roofs. Estimates of costs, samples or additional information will be gladly furnished upon request.

A Partial List of Installations

OWNER	ARCHITECT
Dr. Charles G. Mixter, Brookline, Mass.	William T. Aldrich
Norwood Armory, Norwood, Mass.	McLaughlin & Burr
Donald Philbrick, Cape Elizabeth, Me.	John P. Thomas
Massachusetts State School for Feeble-minded, Wrentham, Mass.	Kendall Taylor & Co.
Scituate High School, Scituate, Mass.	McLaughlin & Burr
Chester Martin, Pawtucket, R. I.	Albert Harkness
Unitarian Parish House, Wellesley Hills, Mass.	Kilham, Hopkins & Greeley
Michael Driscoll School, Brookline, Mass.	Little & Russell
Rectory, St. Mary's Church, Dedham, Mass.	Bigelow, Wadsworth, Hubbard & Smith
Holy Ghost House, Putnam, Conn.	O'Connell & Shaw
Massachusetts Department of Mental Diseases, Gardner, Mass.	Clarence P. Hoyt
Union Church, Watertown, Mass.	Edmund I. Leeds

H. A. MATOT

Miner, Manufacturer and Shipper of Roofing Slates and Slate Products

MAIN OFFICE

POULTNEY, VERMONT

ROOFING SLATE—STRUCTURAL SLATE—FLOOR AND GARDEN FLAGGING

Wide Range of Uses

All colors, thicknesses, and sizes of standard Vermont Roofing Slates for commercial, textural, and graduated roofs.

Slate flagging and structural slate in all colors, sizes, thicknesses and finishes for interior and exterior uses.

Colors

Unfading green, unfading mottled purple and green, colonial gray, gray black, variegated purple and green, clear purple, red, weathering green or sea green in light and dark shades.

Roofing slates furnished in any one or any combination of the above colors in thicknesses from 3/16 in. to 1 in.

Freaks or Rustics

Come in all autumn colors, including delightful shades of browns, buffs, grays, purples, amber, golden pheasants, and bronze pheasants.

The texture of this rock is such that it cannot be manufactured in less than ⅜-in. thickness, but it can be furnished up to and including 1 in. thick. This slate can be used separately or with a mixture of any of the above-mentioned colors and will give a very pleasing effect.

Qualities

The beautiful coloring, distinctive texture, and natural decorative characteristics of Matot's Slate allow harmonious combinations that will blend with surrounding material, whether interior or exterior, and make *slate* the preeminent feature of the home.

Slate is fireproof, practically non-absorptive, requires no upkeep. Its first cost is the last cost—slate is *permanent*. The passing of time will enhance its beauty and add to its intrinsic value.

Stock

Large stocks of both roofing slate and flagging on hand for immediate shipment.

Service

Detailed layouts made for architect's approval and every form of assistance promptly rendered to collaborate with the architects in preparing specifications.

Samples

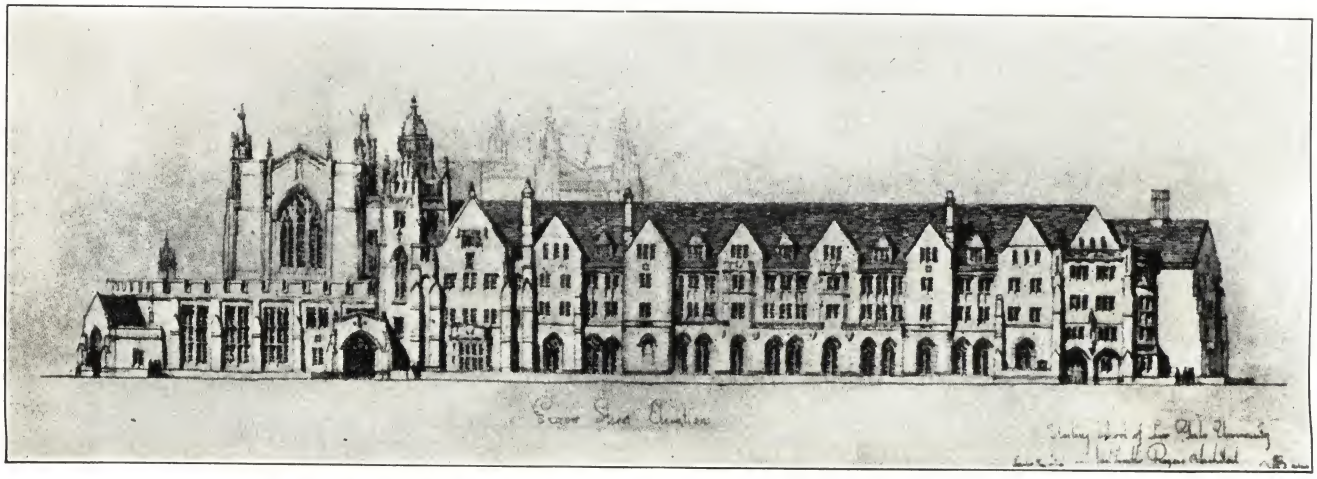
Samples of any slate desired forwarded to architects upon request.

References

A partial list of buildings covered during the past year with Matot's Roofing Slate:

BUILDING AND ARCHITECT

Sterling Law School, Yale University, New Haven, Conn., James Gamble Rogers
Administration Bldg., Wellesley College, Wellesley, Mass., Chas. Z. Klauder
Science Bldg., Phillips Exeter Academy, Exeter, N. H., Cram & Ferguson
Quadrangle Group, Yale University, New Haven, Conn., James Gamble Rogers
Attendant's Home Metropolitan Hospital, Waltham, Mass., Gordon Robb
John M. Wells Residence, Southbridge, Mass., Strickland, Blodgett & Law
St. John's Parish House, Bridgeport, Conn., Frederick G. Frost
Elizabeth Lamont Residence, Millbrook, N. Y., Peabody, Wilson & Brown
Stanley Jones Residence, Westhampton Beach, N. Y., Paul A. Wood
Elementary School, Westerville, Ohio, Thos. D. McLaughlin
Middlesex Hospital, Lexington, Mass., James H. Ritchie
First Methodist Church, Middletown, Conn., Woodbury & Stuart
Academy Bldg., Phillips Exeter Academy, Exeter, N. H., Cram & Ferguson
Church of the Redeemer, West Hartford, Conn., Walter P. Crabtree, Jr.
John R. Macomber Residence (and stable), Framingham, Mass., Parker, Thomas & Rice
Oceanographic Bldg., Woods Hole, Mass., Coolidge, Shepley, Bulfinch & Abbott
Parker Hill Library, Boston, Mass., Cram & Ferguson



Sterling Law School, Yale University, New Haven, Conn. Roofed with Matot's Slate

JAMES GAMBLE ROGERS, Architect

THE STRUCTURAL SLATE COMPANY

PEN ARGYL, PENNSYLVANIA

BRANCH OFFICES
IN EVERY PRINCIPAL CITY

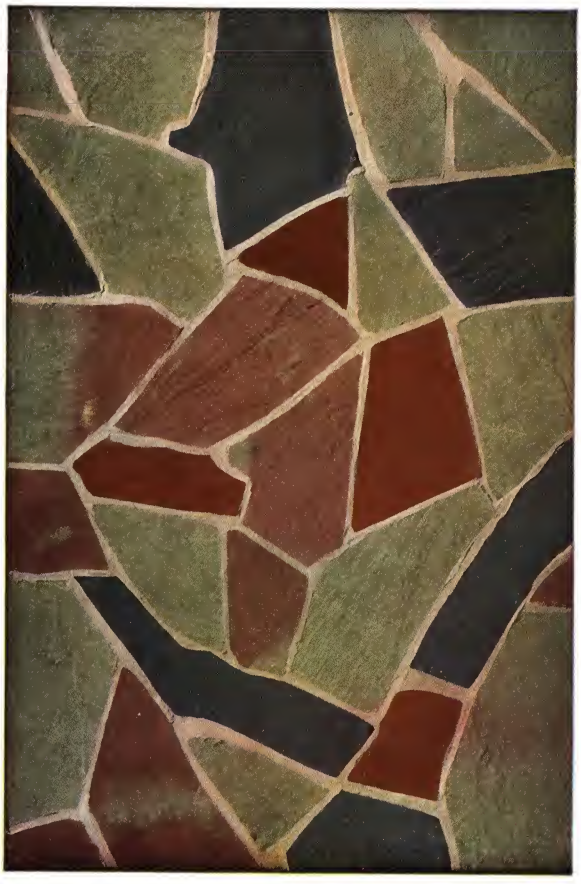
enhanced by the use of blue-gray slate, giving it a depth and background that would otherwise be monotonous. Illustrated to the left is a "Penn-Mont" roof in rough texture and below is illustrated what can be done with "Penn-Mont" Slate in its many colors and also in the clear blue-gray for wainscoting. The natural charm of hand craftsmanship has been given this interior by the use of "Penn-Mont" Slate.

The durability of this product guarantees long wear without upkeep. The colors of natural slate are permanent, becoming even more beautiful with use. With twenty-two active quarries and eighteen branch offices in the United States and Canada we feel that our long experience enables us to render the right type of service. In every branch office throughout the country, district managers and their staff are at your command. Here at the home office our Engineering Department, Flooring and Roofing Department and Architectural Service Department are only too pleased to give your inquiry prompt attention, and will gladly submit layouts and suggestions for floors to blend with particular architectural types.

For years this Company has furnished the architectural profession with only the best grade structural slate. Now, certified roofing slate, inspected and labeled, is offered the discriminating architect. Every shipment is protected with the blue and yellow "Penn-Mont" Label which is not only a mark of recognition but an absolute guarantee of first quality slate and workmanship. It classifies this slate and guarantees that the roof or the floor the architect has selected is in accordance with his specifications in every respect. It is the guarantee of a company whose reputation has been for years and still is jealously guarded. Every piece of "Penn-Mont" Slate is selected from our quarries for its quality, texture, color and strength. On this and the following page are illustrated two floors of "Penn-Mont" Slate in which both design and color have been greatly

Reproduced by direct color on the right is the "Penn-Mont" Shadow Cleft. This irregular design provides an artistic, informal installation well adapted for either interior or exterior use. Its rich blending of hues, charming lines and distinctive texture makes it a leader among materials for installations out of doors.

On the left is a "Penn-Mont" installation for fireplace and for wainscoting that lends a note of charm and individuality to this interior.



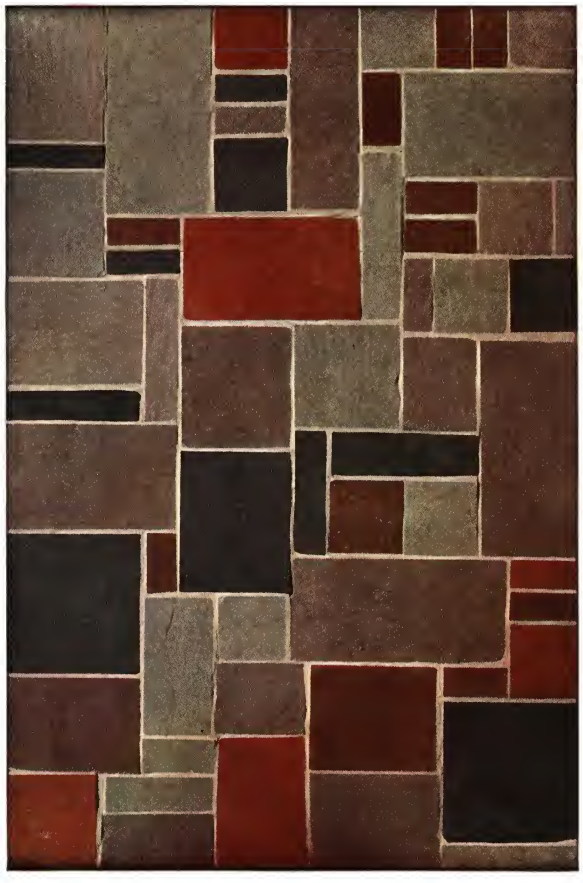
More than a Mark of Recognition

TRADE PYRAMID "CENTURIES OF SERVICE" PENN-MONT ROOFING FLOORING FLAGGING STRUCTURAL SLATE MARK

TRADE MARK REGISTERED

An Absolute Guarantee of Workmanship and Material

From the selection of various products the beautiful coloring, distinctive texture and natural decorative characteristics of slate offer to the architect a material of unusual value. The warm coloring that blends so charmingly together are given the proper contrast by correctly mixing with the design blue-gray slate. This is one of the many reasons why the "Penn-Mont" floors and walks have become popular with architect and builder alike. There is nothing harsh about the coloring in a "Penn-Mont" floor. Slate is selected to give a proper combination of colors for decorative possibility, without the violent clashing of colors which are too strong in tone. "Penn-Mont" Floors are always chastely dignified and charming.



On the left is illustrated the "Penn-Mont" Pocono, a random rectangular floor. The colors in this floor have been reproduced by direct color photography and are a most faithful reproduction of the original floor. This design embodying every characteristic of dignity and good taste, represents a popular choice of those seeking both beauty and durability.

Above is illustrated the residence of Frank Graydon designed by the architectural firm of H. W. Cordes & Sons, Cincinnati, Ohio. This roof in contrast with the one on the preceding page is of uniform thickness and where a plain dignified roof is desired, the "Penn-Mont" blue-gray is an aristocrat and is recognized as the standard of comparison.

"Pyramid Penn-Mont" Roofing Slate is procured from the country's best quarries. Its texture varies and it can be obtained in either a smooth or rough slate. The Structural Slate Company because of its vast resources makes it possible for the architect to choose from any of its quarries the roofing best adapted for the project. Heavy architectural slate with their rugged pleasing texture in blue-gray or colors, are cut by hand, giving them character and individuality. Thinner slate, either smooth or rough, are also all hand cut. Colors that blend with the clear blue sky and the gray dawn, through hues of autumn's tawny russet and tints of green, these beautiful "Penn-Mont" roofs offer natural charm and hand craftsmanship.

DEPARTMENT FOR ARCHITECTURAL SERVICE: One of many features sponsored by The Structural Slate Company is the department for personal architectural service.

By constant contact with America's foremost architects we can render a unique personal service which includes counsel on the various types of roof design, prints and specifications.

VENDOR SLATE CO.

MAIN OFFICE AND ARCHITECTURAL DEPARTMENTS

EASTON, PA.

BRANCH OFFICES

CHICAGO, ILL. 140 South Dearborn Street
CLEVELAND, OHIO, 924 Keith Bldg.
DETROIT, MICH., 13948 Roselawn Avenue
NEW YORK, N. Y., 101 Park Avenue
PHILADELPHIA, PA., 5787 Nassau Road
PITTSBURGH, PA., 6600 Hamilton Avenue

DISTRIBUTORS

BOSTON, MASS., Waldo Bros. Co., 202 Southampton Street
KANSAS CITY, MO., Kansas City Slate & Tile Roofing Co., 21st and Forest Avenue
LOS ANGELES, CAL., Barnes Corning Co., 3363 Fruitland Road
PORTLAND, ORE., Gillen-Cole Co., 15th and Overton Streets
ST. LOUIS, MO., J. E. Williams Slate Co., 3423 Big Bend Road, Maplewood P. O.
SALT LAKE CITY, UTAH, Alex Sims, 129 Motor Avenue
SAN FRANCISCO, CAL., Barnes Corning Co., 220 Montgomery Street
TACOMA, WASH., Gillen-Cole Co., Pacific and Jefferson Streets
MONTREAL, QUEBEC, CAN. Alexander Murray Co., Ltd., 151 Richelieu Street
TORONTO, ONT., CAN., Alexander Murray Co., Ltd., foot of Morse Street

Products

METTOWEE STONE ROOFING

ROOFING SLATE.

FLAGGING SLATE.

All grades of standard Pennsylvania Commercial and Architectural Roofing Slate.

All grades of standard Vermont Commercial and Architectural Roofing Slate.

All classifications of Mettowee Stone Flagging and Flooring.

Architectural Service

VENDOR SLATE CO. offers an extended service to architects through the establishment of additional Architectural Departments at Chicago and Philadelphia, co-operating direct with their main office and quarries. These departments, in addition to those existing in New York and Easton, are prepared to co-operate with the profession. Each department is supervised by an especially trained director, who is thoroughly conversant not only with the practice of architecture, but the quarrying and application details of the roofing slate business as well.

Literature

"Slate for the Roof Architectural," the only catalogue of its type and scope ever published, showing each variety of Pennsylvania and Vermont roofing slate in full color reproduction. Detailed specifications, slating details and various sundry data relating to slate roofing, flagging and flooring. You are requested to avail yourself of this literature. A special treatise on the correct classification and description of every known slate production in America will also be forwarded when requested.

Condensed Classification

BLUE GRAY—*No. 1 Genuine Bangor Certificate*—Strong, unfading.

Genuine Bangor No. 1 Ribbon—Identical to the above, but containing dark streaks unexposed under the lap.

Genuine Washington Big Bed—Strong, unfading and of darker color value than the above.

Genuine Albion—Similar in general appearance to Genuine Bangor, but used for more moderately priced construction.

GREEN—*Verdelite Unfading Green*—A most durable slate of unfading quality. Exceptionally defined as to color.

Weathering Green—A deeper shade of green when quarried which, owing to its weathering nature, changes to various shades of browns, buffs and tans.

Sea Green—A slate containing a wider range of shades when freshly quarried than the above. Will change to indeterminate proportions of browns, buffs, tans, yellows and sometimes white.

MOTTLED GRAY—A beautiful unfading slate, quite similar to Unfading Green only of darker color value and including dark markings of various intensities.

VARIEGATED GREEN AND PURPLE—An unfading slate of unsurpassed beauty. Each slate contains the two colors noted.

MOTTLED GREEN AND PURPLE—This slate weathers slightly, the general effect after years of exposure results in a purplish bronze. The slate itself is more purple than green, the green spots and splashes being distinct mottlings.

CLEAR PURPLE—A very rare slate, sometimes weathering and sometimes unfading. Generally of a rich deep subdued shade.

FLORENTINE RED—A very subtle and dignified color, but distinctly red in value.

General Specifications

(1) Preparation of Roof—Before proceeding with roofing work of any nature whatsoever, the roofer shall examine all roof surfaces so intended for the application of slate and report for correction, any and all defects therein which will interfere with the execution of his work and guarantee thereof.

(2) Cant Strip—Carpenter Contractor shall provide in place at all eaves a beveled cant strip 1 in. in thickness at the lower side and 2 in. or more in breadth, so beveled that the first course of slate will rest evenly thereon.

(3) Paper—Cover all roof surfaces so intended for slate application with an approved brand of 40-lb. asphalt impregnated roofing felt. This felt shall be laid to shed water and accordingly lapped 4 in. on the rafter and 12 in. where vertical joints are occasioned. It must be in perfect, undamaged condition when slate is applied. NOTE: Roofer shall not drive either his stake or hammer into the roof sheathing.

(4) Cement—Within 1 ft. of dormers vertical walls, valleys, ridges, hips and similar places, slate shall be laid in an approved brand of elastic cement approximating the general color value of the slate.

(5) Nails—Each slate shall be secured with 2 copper slating nails of sufficient length to penetrate the roof sheathing 1 in. in every instance. In no case shall nails be driven through flashings except when applying same.

(6) Slate—Cover all properly felted roof surfaces as above detailed with (insert herein the type of slate desired) as supplied by the VENDOR SLATE COMPANY, Easton, Pa., with their certificate as to kind and quality and in strict accordance with their details as approved by the architect.

(7) Laying of Slate—All slate shall be laid in a proper weather-tight manner with well broken joints, preserving a standard headlap of 3 in. under the second course above in all instances. Corners and butts shall not be intentionally broken. However, a certain latitude due to normal breakage of corners will be acceptable, but severely broken slate shall not be applied.

(8) Valleys—Select type desired as follows:

Open Valleys—Provide 16-in. soft rolled copper flashing 24 in. wide fastened at the top only. In applying slate, care shall be used that no nails penetrate the metal valley.

Closed Valleys—Slip flash all closed valleys with 16-oz. soft rolled copper flashing with each course. Flashing shall lap at least 2 in. and shall extend 12 in. on each side of valley.

Rounded Valleys—Slate shall be carefully cut, fitted and laid with special length and width slate. Course lines shall carry round from roof to roof except where otherwise required and so noted on the layout. No metal is required unless specially directed, but great care should be used in breaking joints and applying slate, to avoid leaks.

(9) Ridges—Select type desired as follows:

All ridges shall be laid to form (Combed Ridges) (Saddle Ridges) (Boston Ridges). It is understood that the three top courses of slate shall be laid in elastic cement and so arranged that a first class waterproof job will result. In no instance shall the cement be so applied that it will run over face of the slate. (Exposed nailheads, if any, in ridge course, to be covered with elastic cement as here before described.)

(10) Hips—Select type desired as follows:

All hips shall be laid to form standard (Mitered Hips) (Fantail Hips) (Boston Hips) (Saddle Hips) and shall be carefully embedded in elastic cement as herebefore described.

(11) Dormer Cheeks—Dormer cheeks where so indicated on the plans are to be covered with roofing slate as here before described.

(12) Cleaning Up and Guarantee—The Contractor shall guarantee his work for a period of at least (.....) years, replacing or repairing any broken slates or leaks until the end of his guarantee period. Any stains of any nature whatsoever, excluding stains or dirt streaks caused by other contractors at time of building, shall be removed before acceptance of his work will be granted.

"METTOWEE STONE" SLATE ROOFS

Mettowee Stone Roof Panel No. 56 (Vendor Slate Co.)

Mettowee Stone Roof Panel No. 57 (Vendor Slate Co.)

These two combinations are presented in 70% standard and 30% ¼" thickness, and are of moderate cost. Heavier and graduated thickness can be supplied in similar color arrangement. Complete layouts will be designed and furnished in each individual case if you will loan us the roof plans. (See next page)

ESTABLISHED 1901

O'BRIEN BROTHERS SLATE COMPANY, INC.

Quarriers and Manufacturers of Roofing Slate and Slate Flagging

MAIN OFFICE
GRANVILLE, N. Y.
QUARRIES—PAWLET, VERMONT
ARCHITECTS SERVICE DEPARTMENT, 101 Park Avenue, NEW YORK, N. Y.

Products

UNFADING GREEN; UNFADING MOTTLED GREEN and PURPLE; GRAY; WEATHERING GREEN; VERMONT BLACK; RUSTICS (so-called Freak Slate).

Colors

Unfading Green—Considered one of the best products manufactured in Vermont Roofing Slate, absolutely unfading and a certificate is furnished by the Unfading Slate Association to the effect that our slate is *unfading.*

Unfading Mottled Green and Purple—The green and purple color appears in each individual slate. A certificate is furnished by the Unfading Slate Association with every shipment which guarantees that the slate is *unfading* and is of the best possible slate rock obtainable.

Gray—This slate is furnished in two shades, a light and dark, and is of a somewhat rougher texture than our other slate.

Weathering Green—A commercial slate that gives the owner the best possible roof protection at the least possible price. This material fades out but this fading does not affect the watertightness of a roof of this color.

Vermont Black—A rough texture slate produced only in ¼ in. and thicker thicknesses. Some are a shiny black while others are sort of gray-black.

Rustics—The quarry people call them Freaks, they are a top rock of very poor qualities for durability. The bronze and yellow colors disappear after being exposed to the weather. This type of slate is recommended only in ⅜ in. and thicker thicknesses.

Specifications

(1) General and Guarantee—

(a) The General Conditions of the contract are hereby made a part of the contract and this contractor shall examine these General Conditions and thoroughly acquaint himself with all the requirements therein contained.

(b) This contractor shall furnish all materials and labor in accordance with the drawings and these specifications.

(c) This contractor shall inspect all surfaces prepared for slating by other trades, point out to the proper authority all defects, and shall not proceed with the laying of felt, flashings or slate until the necessary corrections have been made.

(d) Roofing shall be applied by workmen experienced in the applying of slate.

(e) The roofing contractor shall furnish his own scaffold or rigging, or arrange with the general contractor for the use of scaffolds furnished by others.

(f) A written guarantee shall be furnished that the materials used are in strict accordance with these specifications, and that any and all repairs required on the roof due to defective materials or workmanship furnished under this contract shall be made without cost to the owner for a period of one year.

(2) Roofing Felt—

(a) On all boarding to be covered with slate, furnish and lay asphalt saturated rag felt, not less in weight than that commercially known as "14-lb." felt. In this weight, per 100 sq. ft., a tolerance of 1 lb. plus or minus will be allowed.

(b) Felt shall be laid in horizontal layers with joints lapped toward eaves and at ends at least 2 in. and well secured along laps and at ends as necessary to properly hold the felt in place and protect the structure until covered by the slate. All felt shall be preserved unbroken, tight and whole.

(c) The felt shall lap over all hips and ridges.

(d) Felt shall be lapped 2 in. over the metal of any valleys or built-in gutters.

(3) Slate—

Slate shall be of commercial standard No. 1 quality and thickness, size 14 x random widths, Unfading Green Slate as mined and manufactured by O'BRIEN BROTHERS SLATE COMPANY, INC., Granville, N. Y. A certificate of the Unfading Slate Association of Vermont shall be furnished by the contractor.

All slate shall be hard, dense, sound rock, machine punched for two nails each. All exposed corners shall be practically full. No broken corners on covered ends which sacrifice nailing strength or the laying of a watertight roof will be allowed. No broken or cracked slates shall be used.

(4) Hips—

(a) All hips shall be laid to form "saddle" hips without metal underneath.

(5) Ridges—

(a) All ridges shall be laid to form "saddle" ridges. The nails of the combing slate shall pass through the joints of the slates below.

(6) Valleys—

(a) All valleys shall be laid to form "open" valleys.

(7) Elastic Cement—

(a) Cement shall be an approved brand of waterproof elastic slaters' cement colored to match as nearly as possible the general color of the slate.

(8) Nails—

(a) All slate shall be fastened with two large-head slaters' solid copper nails. Use 3d (1¼-in. nails for slates 18 in. or less in length, 4d (1½-in.) for 20-in. or longer, and 6d (2-in.) for slates on hips and ridges.

(9) Slating—The entire surface of all main and porch roofs, the roofs and sides of any dormer windows, if shown, and all other surfaces so indicated on the drawings, shall be covered with slate in a proper and watertight manner.

(b) The slate shall project 2 in. at the eaves and 1 in. at all gable ends, and shall be laid in horizontal courses with the standard 3-in. headlap, and each course shall break joints with the preceding one. Slates at the eaves or cornice line shall be doubled and canted ¼ in. by a wooden cant strip.

(c) Slates overlapping sheet metal work shall have the nails so placed as to avoid puncturing the sheet metal. Exposed nails shall be permissible only in top courses where unavoidable.

(d) Neatly fit slate around any pipes, ventilators, etc.

(e) Nails shall not be driven in so far as to produce a strain on the slate.

(f) Cover all exposed nailheads with elastic cement. Hip slates and ridge slates shall be laid in elastic cement spread thickly over unexposed surface of undercourses of slate, nailed securely in place and pointed with elastic cement.

(g) Build in and place all flashing pieces furnished by the sheet metal contractor and co-operate with him in doing the work of flashing.

(h) On completion all slate must be sound, whole and clean, and the roof shall be left in every respect tight and a neat example of workmanship.

ESTABLISHED 1869

RISING & NELSON SLATE CO.

Miners, Makers and Shippers of High Grade Slate

MAIN OFFICE
WEST PAWLET, VT.

NEW YORK OFFICE, 101 Park Avenue
PHILADELPHIA OFFICE, 112 South 16th Street
CHICAGO OFFICE, 2554 West Harrison Street
DETROIT OFFICE, 2539 Woodward Avenue
LONDON OFFICE, 26 Martin Lane, Cannon Street
ARCHITECTS' SERVICE DEPARTMENT, 101 Park Avenue, NEW YORK, N. Y.

Products

ARCHITECTURAL and COMMERCIAL ROOFING SLATE.
SLATE for FLOORS and WALKS.
GARDEN FLAGGING.

Tudor Stone Roofs and Flagging

TRADE-MARK

Production and Service

Tudor, Georgian, Cotswold and Colonial types of architectural slate, from quarries which this Company owns and operates under its personal supervision, may be had in medium or rough textures as desired. This slate is made and assembled under the direction of a unique Service Department in charge of experienced architects who specialize and assist in the design of roofs to conform with the architecture of individual buildings.

Architects are invited to make use of the facilities offered, either for preliminary work or for the preparation of complete roof layouts and estimates of cost. Nor need the service end there as arrangements can be made to send an architect to the job to consult with the roofing contractor and to assist in the proper application of the slate. Thus a harmonious roof as a part of the individual building is assured.

Samples and literature will be sent on request.

Verde Unique

Beautiful dark unfading deep green, in a darker shade than from any other quarry. This exclusive slate in particularly adaptable to the Colonial type of architecture, but can be used with equally satisfactory results on other types of buildings on which a dark green roof will harmonize. Is of exceptional value in several color combinations. Any thickness or graduation from ¼ in. up.

Velenheli Purple Blend

A distinctive rich unfading purple with tints of green, blending to a more even mixture of the two shades. This slate, an exclusive production, is especially adaptable to the Georgian type of architecture as well as to numerous color combinations. Any thickness or graduation from ¼ in. up.

Note: Verde Unique and Velenheli Purple Blend cannot be duplicated from other quarries and for quality, color and texture are in a class by themselves.

Vermont Gray Black

Varies from dark gray to black, with much more interesting texture than blue black slate. Adaptable to French or Dutch type of architecture as well as to certain color combinations. Any thickness or graduation from ¼ in. up.

Imperial Unfading Green

A handsome, fast color slate in either light, medium or dark shades. Any thickness or graduation from $\frac{3}{16}$ in. up.

Unfading Mottled Green and Purple

A beautiful mottling of green and purple shades, some nearly clear, but more frequently a blending of the two colors in each unit. Any thickness or graduation from $\frac{3}{16}$ in. up.

Variegated Purple

Purple color predominating, part of them being clear purple, but some with green spots and shadings. Any thickness of graduation from $\frac{3}{16}$ in. up.

Unfading Mottled Gray

Varies from medium light to dark, and from nearly clear to nicely clouded.

An exceptionally good fast color slate at a comparatively low price.

Any thickness or graduation from $\frac{3}{16}$ in. up.

Weathering Green

A standard slate of the best quality that has been used more than any other. Weathers to varying shades of greens, grays, buffs, soft browns, etc.

Largely used in practically every combination that contains weathering slate.

Any thickness or combination from $\frac{3}{16}$ in. up.

Rustics

This highly colored slate is quarried from near the surface and is used to obtain an immediate color effect. Being surface material, most of it is not of a solid character and its exceptional color is its greatest recommendation.

Any thickness or graduation from $\frac{3}{8}$ in. up.

A Sketch of a "Tudor Stone" Roof

Monson-Maine

This slate commends itself to the architect who is seeking the finest type of unfading black slate. It is unsurpassed for strength and lasting qualities and is far more beautiful than inferior materials. Monson-Maine slate is shipped direct from our quarries and, therefore, receives the same strict supervision and inspection as our other slate.

This beautiful black slate costs only a little more at the quarry, the freight charges are the same, and it costs no more to apply than inferior slate. Hence, a truly high class roof may be specified without seriously increasing the total appropriation for the building. Particularly adaptable to the Normandy type of architecture and design.

Specifications for "Tudor Stone" Roofing Slate

Preparation—Slating contractor shall examine roof boarding and report to carpenter all defects which would be detrimental to the durability of the finished roof, and shall see that defects are remedied before applying felt.

Carpenter contractor shall furnish and apply a cant strip nailed about 2 in. above the eave line of the slate and shall put water shedding cant strips back of chimneys and up the sides of dormers and where else required.

Roofing contractor shall furnish and apply elastic cement where in his judgment the same is necessary.

Felt—Cover surface to be slated, including cheeks of dormers, with slater's asphalt impregnated roofing felt weighing 30 lbs. to 100 sq. ft. lapped 6 in. at joinings. *(See Note 1.)*

Where curved slate valleys are shown felt shall be double thickness.

Slate—All surfaces prepared for slate as above described shall be covered with "Tudor Stone" Roofing Slate, as made by the Rising & Nelson Slate Co., West Pawlet, Vermont.

Thickness, exposure to the weather and character of laying shall be as indicated on roof layout prepared by the Architects' Service Department of the Rising & Nelson Slate Co., under the direction of the architect.

Nails—Nails shall be copper slater's nails of sufficient length to adequately penetrate the roof boards using not less than 2 to each slate.

Flashing—The sheet metal contractor shall furnish and the slate contractor shall install 16-oz. soft rolled copper built-in flashings as required at closed valleys, chimneys, dormers and other necessary places. Flashing shall extend not less than 4 in. under slate and have not less than 4 in. exposed above the slate on a line at right angle to the roof and shall not be nailed to the vertical surface. Roofing contractor shall insert all aprons required, which will be furnished by sheet metal contractor. Sheet metal contractor shall apply counterflashing and make same secure against leaks.

Open Valleys—All open valleys shall be 16-oz. soft rolled copper, 20 in. wide, nailed at top only. In applying slate, care shall be used that no nails penetrate the sheet metal valleys.

Closed Valleys—All closed valleys to be flashed with 16-oz. copper flashing over each course. Flashing to lap at least 2 in. and to extend 10 in. either side of valley.

Round Valleys—To be carefully fitted and laid with special long slate. No metal used unless specially directed, but care must be taken to preserve continuity of roof color and texture.

Ridges—Ridges and hips shall be of slate laid mitered (or Boston style). If design should so require, ridges and hips should have 16-oz. copper hip and ridge rolls as shown and detailed.

Guarantee—Contractor shall guarantee to maintain all slate roof surfaces in a watertight condition for a period of 2 years from completion.

Specification for Plain Hipped Roof with Valleys and Dormers Using Commercial Grade Slate

Preparation, Cement, Felt and *Guarantee* to be specified as described under heading "Tudor Stone" Roofing Slate with such modifications as may be necessary to meet the individual problem.

Slate—All surfaces prepared with felt as above described shall be covered with No. 1 Weathering Green *(see Note 2)* Roofing Slate, as furnished by the Rising & Nelson Slate Co., West Pawlet, Vermont. Slate shall be of random widths and 16 in. long *(see Note 3)*; laid with 3-in. head lap so that distance to the weather shall be 6½ in.

Nails, Valleys, Flashing and *Ridge* to be specified as described under heading "Tudor Stone" Roofing Slate.

Specification Notes

Note 1—For best commercial work 30-lb. felt is recommended. For slate not over ¼ in. thick 16-lb. felt may be used.

Note 2—Substitute, if desired, standard thickness Unfading Green, Mottled Green and Purple, Variegated Purple, Unfading Mottled Gray or Monson-Maine.

Note 3—Substitute other lengths or uniform widths if desired, but note that commercial slate are made in lengths from 10 to 24 in., always in even inches, and that slate should have 3-in. head lap on second slate.

SLATE FOR FLOORS, TERRACES, WALKS AND GARDENS

Varieties

Split, rubbed or planed surface, trimmed or sawed edges. Irregular shapes, random sizes, rectangular shapes or regular size pieces. In full range of colors and any thickness.

Samples and literature will be sent on request.

Specifications for Slate Floors, Terraces and Walks

Slate—The contractor shall furnish and lay all slate for walks, floors and terraces listed below. Slate shall be (here specify color, thickness, surface, size when necessary, shape or pieces, style of edges and width of joints).

On Soil with Grass Joints (Soil or Turf Subbed)—If ground is not well settled, wet and tamp thoroughly. Lay slate directly on soil in (here specify arrangement and pattern). Each piece of slate shall rest on a solid, even bed with the top surface level.

On Soil with Grass Joints (Cinder Subbed)—Mark out location of all walks and terraces to be laid with slate with grass joints and excavate to a depth of 8 to 10 in. Fill excavations with cinders from 6 to 8 in. deep, well rolled and tamped to an even surface. On top of cinder bed place a 2-in. layer of soil and on soil lay slate in (here specify arrangement and pattern). Fill all joints with soil to level of surface of slate and sow grass seed.

On Masonry Slab Laid in Concrete—Place from 1 to 2 in. (depending on final level) of setting mixture (3 parts sand with 1 part of cement). As soon as this setting bed is leveled, sprinkle with pure portland cement to perfect bond between bed and slate and lay slate in (here specify arrangement and pattern). Thoroughly wet pieces of slate and firmly embed to desired level. Point all joints with concrete mixed 2 parts well-sieved sand and 1 part cement.

A Walk of "Tudor Stone" Slate

Cleaning Slate—*(Note: Only required for slate floors with concrete mixture joints).* Sponge all slate as set on exposed surface with clean water to remove mortar stains, and, if necessary upon completion, rub down with a solution 3 parts coal oil and 1 part linseed oil. (If light or weak solution of muriatic acid is needed and used for cleaning, care should be taken to wipe only exposed slate surfaces to avoid eating out cement joints.)

Completion—Upon completion, all slate shall be sound, whole and clean; the work shall be left smooth and in every respect a neat example of craftsmanship.

F. C. SHELDON SLATE COMPANY

GRANVILLE, N. Y.

BRANCHES IN PRINCIPAL SLATE CONSUMING CENTERS

ATLANTA, GA., Rhodes Haverty Bldg.
CHICAGO, ILL., 2654 Ward St.
TORONTO, ONT.
DETROIT, MICH., 733 Congress Street
KNOXVILLE, TENN., 426 W. Depot St.
LOS ANGELES, CAL., 9030 Sunset Blvd.
MONTREAL, P. Q., 714 St. Maurice St.
NEW YORK, N. Y., 101 Park Ave., Room 514
PHILADELPHIA, PA., Perry Bldg.
PORTLAND, ORE, 501 Grand Ave.
ST. LOUIS, MO., 320 Grand Boulevard, No.
SEATTLE, WASH., 1107 W. Idaho St.

PLANTS AND ASSEMBLING YARDS AT POULTNEY, PAWLET, AND RUPERT, VT., GRANVILLE AND MIDDLE GRANVILLE, N. Y.

ROOFING AND FLOORING EXHIBITS

BUFFALO, N. Y., Architects' and Builders' Exhibits, Inc., 1 Niagara Bldg.
CLEVELAND, OHIO, Builders' Exchange Bldg.
NEW YORK, N. Y., Architects' Samples Corporation, 101 Park Ave.
PHILADELPHIA, PA., Architects' Bldg., N. E. corner 17th and Sansom Sts.

The Company and Its Service

Owns and operates, with subsidiaries, twelve quarries, five mills and five assembling yards, extending throughout Vermont-New York Slate Belt. Produces and sells, under personal supervision of Staff Experts, a complete variety of slate for every purpose in any desired style or finish. A fleet of twelve trucks supplements rail deliveries.

Architectural Service

Sketches, layouts, and every form of co-operative assistance promptly rendered. Roof installations personally supervised when conditions require.

Certificate

A certificate fully guaranteeing the character and quality of all material furnished by us as being in accordance with specifications will be furnished on request.

Specialties

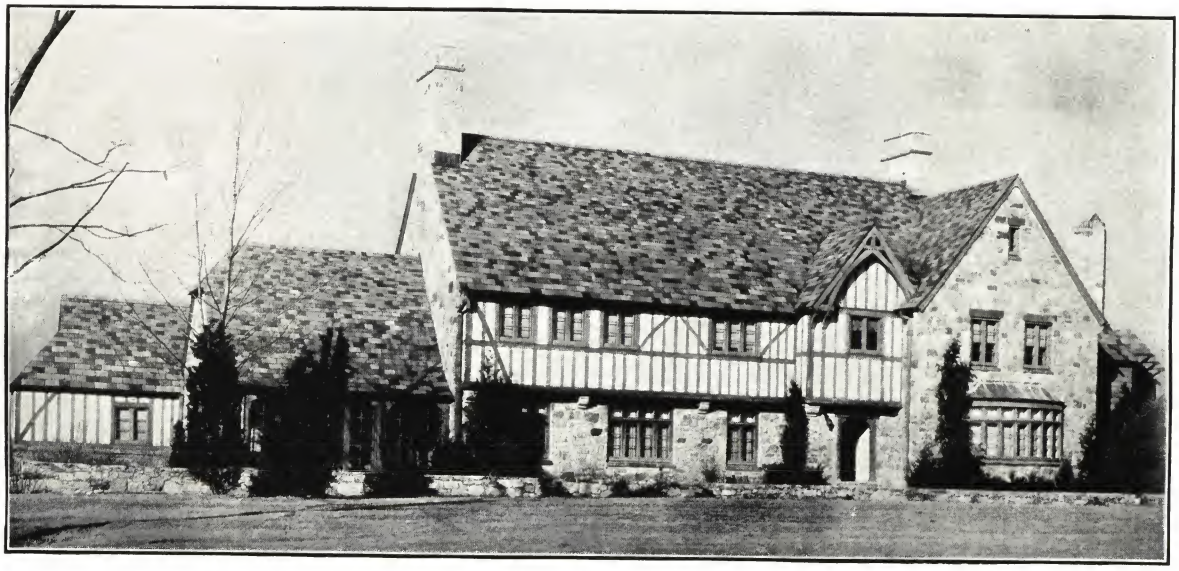
Sheldon's Unfading Mottled and Rustic Gray—Slightly varying shades—gray background with dark harmonious colorings.

Sheldon's Unfading Green—Strictly uniform in color—fully conforming to established standards for quality and color permanency. Produced at Poultney, Vermont, from one of the oldest and most extensive deposits of unfading slate in that area.

Sheldon's Special Olde English Rough Texture—Thickness ranging $^{3}/_{16}$ in. to $^{3}/_{8}$ in. Any combination of sizes and colors. Applied in accordance with our layout, this material develops a splendid low priced Architectural roof fully justifying the confidence implied by an ever increasing demand.

Sheldon's Semi-weathing Green and Gray—A standard of comparison. Colors so combined as result of special tests, uniform percentage on exposure weather to soft tones of brown and buff, balance retain original color. Unexcelled for low cost and unlimited durability. Possess every desirable feature for the perfect roof. Modulus of rupture 14,000 lb. per sq. ft. Porosity less than ¼ of 1%.

Sheldon's Arabian Red—Exclusive and distinctive. Grows uniformly brighter on exposure. Ample supply and production facilities to insure prompt execution of all orders either for roofing or structural purposes. Only deposits in America located in Washington County, N. Y. Can also be furnished in suitable sized nuggets or granules for walks, driveways, tennis courts and golf



Henry A. Rudkin Residence, Fairfield, Conn.

WALTER BRADNEE KIRBY, Architect

FANTON & ROBERTS, Roofers

courses.

Sheldon's Olde English Combination No. 12—One of the highest achievements in architectural slate. A beautiful blending of soft colors which "fit" the building. Simply specify "Roofs to be covered with Sheldon's Olde English Combination 12 (following with maximum and minimum thicknesses and exposure) as manufactured by F. C. SHELDON SLATE COMPANY, Granville, N. Y. in accordance with their layout as approved by architect".

Heather Combination—The name describes matured effect. A grouping of colors in commercial slates combining attractiveness and low cost. Full beauty is revealed after weathering has taken place following exposure to elements. One of our most popular productions contributing toward reduced cost without sacrifice of any of the principal features of a good looking, absolutely permanent roof.

H. F. Harper Residence, Lansing, Mich.
BECKETT & AKITT, Architects EAGLE CORNICE & ROOFING CO., Roofers

Samples

Any of our slate, either for roofing or structural purposes and in any desired size or finish, will be furnished gratis on request.

Structural Slate

Any of the slate described herewith can be furnished from our own quarries and mills not only for roofing purposes but for many interior and exterior decorative and sanitary uses such as benches, baseboards, chimney caps, coping, drain boards, flooring, fountains, garden walks, landings, laundries, garages, mantels, paving, pastry boards, risers, treads, shower stalls, switchboards, septic tanks, shelving, sinks, stepping stones, thresholds, toilet partitions, table tops, walks, window sills, wainscoting, work benches, sun dials, building veneer, etc.

Recent Projects Roofed With Sheldon's Slates

PROJECT	LOCATION	ARCHITECT
St. Mary's Academy Group	Monroe, Mich.	D. A. Bohlen, Indianapolis, Ind.
Goodyear Estate	East Aurora, N. Y.	John Russell Pope, New York, N. Y.
Lester Armour Residence	Lake Bluff, Ill.	David Adler, Chicago, Ill.
Alpha Delta Phi House	Ithaca, N. Y.	John Russell Pope, New York, N. Y.
Colgate Divinity School Group	Rochester, N. Y.	James Gamble Rogers, New York, N. Y.
Notre Dame Academy Dormitories	South Bend, Ind.	Maginnis & Walsh, Boston, Mass.
Albany Academy	Albany, N. Y.	M. T. Reynolds, Albany, N. Y.
McCarty Memorial Church	Los Angeles, Cal.	T. P. Barber, Los Angeles, Cal.
St. Mary's Church	Longmeadow, Mass.	J. W. Donahue, Springfield, Mass.
Country Day School	Whitefish Bay, Wis.	Fitzhugh Scott, Milwaukee, Wis.
Extensible Bldg., Department of Agriculture	Washington, D. C.	Government
Howard University	Washington, D. C.	A. I. Cassell, Washington, D. C.
Belle Skinner Music Building	Poughkeepsie, N. Y.	Allen & Collens, Boston, Mass.
University of Buffalo	Buffalo, N. Y.	E. B. Green & Sons, Buffalo, N. Y.
House of Good Shepherd	Hartford, Conn.	Gander, Gander & Gander, Albany, N. Y.
Northampton State Hospital	Northampton, Mass.	Gordon Robb, Boston, Mass.
Elliott House	Brighton, Mass.	Shepley, Bulfinch et al., Boston, Mass.
Mrs. K. C. Reed Residence	Lake Forest, Ill.	David Adler, Chicago, Ill.
B. H. Hardaway Residence	Columbus, Ga.	Smith & Biggers, Columbus, Ga.
John Russell Pope Residence	Newport, R. I.	J. R. Pope, New York, N. Y.
Rand Residence	Buffalo, N. Y.	E. B. Green & Son, A. H. Hopkins
M. E. Church	Knoxville, Tenn.	Barber & McMurray, J. R. Pope.

CLASON WIRE SNOW GUARD FOR ROOFS

Manufactured Only by
THE M. N. CARTIER & SONS CO.
Cartier Building, 275 Canal Street
PROVIDENCE, R. I.

Products

WIRE SNOW GUARDS for slate, tile, asbestos shingle, metal and other steep roofs.

Their Purpose

To lessen chances of damage suits against owners of property by increasing both personal and property safety.

There are many buildings so situated that the use of snow guards is essential to personal safety; there are more cases where the use of snow guards could protect the surrounding roofing and sheet metal work against costly damages.

Sliding snow and ice often injure roofings, and puncture or tear away gutters, etc. The use of our snow guards forestalls these dangers, as they hold the ice and snow where they form. They are a cheap and unobtrusive preventive against damage.

Important Notation

We note a growing tendency to permit the installation of three, four, or five courses of snow guards near the roof eaves. The result is that a few guards are compelled to hold not only the weight of snow and ice which they are located to care for, but also to withstand the tremendous tearing force of slides starting from the roof surfaces above.

No guards will withstand such conditions, and their installation in such a manner precludes the *purpose* for which they are used. When specifying our guards please do so according to our table and *insist* upon the roofer following the specification.

Manufacture

We make our guards in our own plant, and are not dependent upon the facilities or services of others. These guards are manufactured either from pure copper wire or galvanized steel wire, both selected for ductility and stiffness. No copper-covered steel wire is used.

Practicality

Our wire snow guards combine strength, long service, economy and unobstructive design.

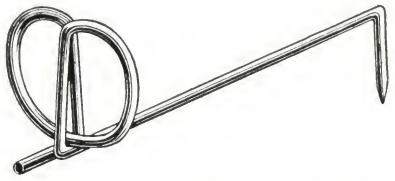
Types of "Clason" Snow Guards

New roofs, 1 and 2-in. points.
Hook and friction for old roofs.
Solder-to-metal-roof.
Special for Spanish tile.
Special for asbestos shingles.
2-in loop and 2-in. point "Clason" Snow Guards for flat tile and thick slate roofs.

The "Clason"

The "Clason" has been used for many years and has given uniformly satisfactory service; it is one of the strongest guards made.

Note from the illustration that the "butterfly" loops brace and strengthen each other, while the extension brace lends additional strength.



"Clason" Snow Guard for New Roofs

Number Per Square

The following table gives the approximate number of snow guards which may be safely specified for use in each 100 sq. ft. of roof surface:

ROOF PITCH	NUMBER OF GUARDS
One-quarter	50
One-third	75
One-half	125

Towers, and steeper roofs than above indicated, may require special consideration.

How to Specify

Apply to all pitched roofs "Clason" [for old roofs "Clason Special"] Snow Guards, as made by THE M. N. CARTIER & SONS CO., Providence, R. I. The guards to be made from pure copper [galvanized steel] wire. (Here specify the number of guards required per square, dependent upon the pitch of the roof and other special conditions.)

In applying the snow guards, the eaves course of the roofing material shall be laid as usual, but the next course shall be laid with the joints slightly open to receive the shank of the snow guard.

After striking the line for the third course of the roofing material, place the guards in the joints, with the loop just below the lap of the course, and drive the prong into the roof decking; then lay the course, leaving only the loop exposed.

Care must be used to insure having the shank well sunk into the joints, so that the following course of roofing material will lie flat and not bear upon the guard.

(*Note:* The architect or engineer may omit at his discretion the method of application of the guards.)

DAVID LEVOW

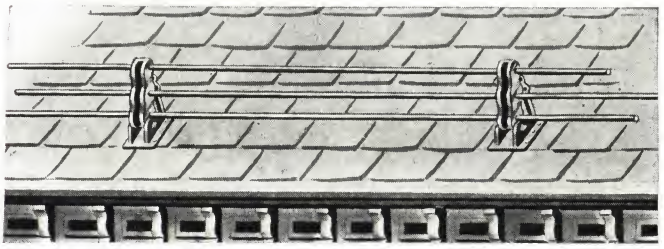
TELEPHONE:
CHelsea 3-2400

308 West 20th Street, NEW YORK, N. Y.

For "Fitrite" Roof Strainers, see Manufacturers' Index

"FITRITE" ADJUSTABLE PIPE SNOW GUARDS

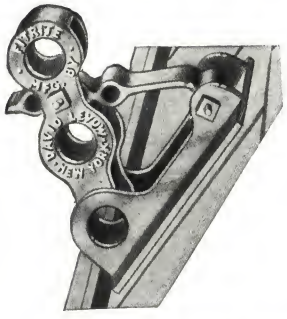
Material—Made in galvanized malleable iron or bronze. Adjustable to four positions.



Fits any slate roof of any pitch. To be used with 2 or 3 galvanized iron pipes ¾-in. iron pipe size.

Instructions—Place "Fitrite" Snow Guards along eaves of roof 5 or 6 ft. apart. Plate takes the place of a slate and is fastened with wood screws or nails.

Size of Plates—Made in any size for standard No. 1 slate, but can also be made with thicker plates. Unless otherwise specified Standard No. 1 plates will be supplied.



Also made for Spanish Tile and Special Design shingles.

Features—Underside of Snow Guard lined with special sheet lead shield, thereby preventing sharp edges of plate from coming in contact with slate and eliminating the possibility of cracking or breaking of slate. Shield is so attached that rivets do not come in contact with slate.

Patent Applied for

Recent Installations—(For slate roofs unless otherwise specified):

Building and Location	Architect
U. S. Post Office, Brooklyn, N. Y.	
St. Joseph School, Maplewood, N. J.	McKenna & Irving, New York, N. Y.
Ridgewood High School, Ridgewood, N. J.	Fanning & Shaw, Paterson, N. J.
R. C. Church of Christ the King, Jersey City, N. J.	Fanning & Shaw, Paterson, N. J.
U. S. Post Office and Courthouse, Utica, N. Y.	
St. Michael's Church, Amsterdam, N. Y.	Morgan & Millaman, Troy, N. Y.
Roosevelt High School, Yonkers, N. Y.	C. Howard Chamberlain, Yonkers, N. Y.
Howard University, Washington, D. C.	A. I. Cassell, Washington, D. C.
*Kings County Hospital, Brooklyn, N. Y.	Le Roy P. Ward, Inc., New York, N. Y.
**Temple Emanu-El, Fifth Avenue, New York, N. Y.	Robert D. Kohn, New York, N. Y.
***Crippled Children's Home, Port Jefferson, L. I., N. Y.	F. J. Berlenbach, Brooklyn, N. Y.

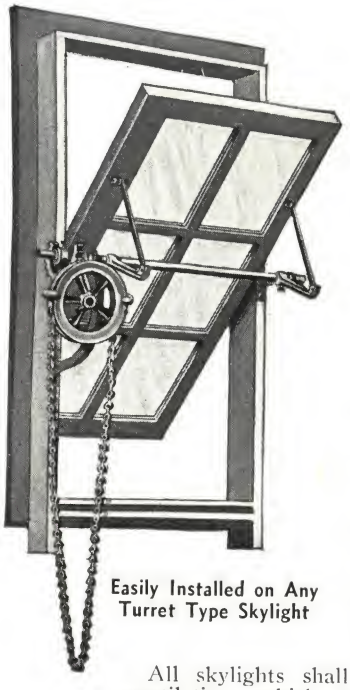
*Mission Tile. **Copper Roof. ***Spanish Tile.

SPECIFICATIONS FOR "FITRITE" ADJUSTABLE PIPE SNOW GUARDS

All slate roofs shall be provided around eaves with Improved "Fitrite" Adjustable Pipe Snow Guards (with sheet lead shield) galvanized iron or bronze. Plate to be same size as slate used and to be placed on roof like a slate. Snow Guard brackets to be 5 to 6 ft. apart. ¾ in. I.P.S. galvanized or brass pipes to be used. Snow Guards are to be "Fitrite" Adjustable Pipe Snow Guards as manufactured by David Levow, 308 West 20th Street, New York, N. Y.

Specifications for Mission, Spanish or Shingle Tile are the same as slate roof, except mention style of slate to be used.

"FITRITE" SKYLIGHT GEARING



Easily Installed on Any Turret Type Skylight

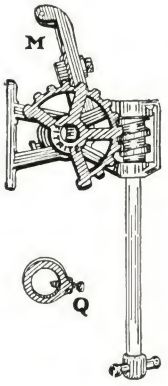
Features—Instead of the usual round pipe holes (where the only point of contact is at the setscrew), "Fitrite" Skylight Gearing has special oval pipe holes on arms and lifting gear. The result is a much firmer grip (contact at *three* points instead of one) and absolute freedom from rattling in any position. Accurately machined. No filing necessary.

Material—Made in best quality gray iron; and also in solid bronze which is rustproof and harmonizes with copper skylights.

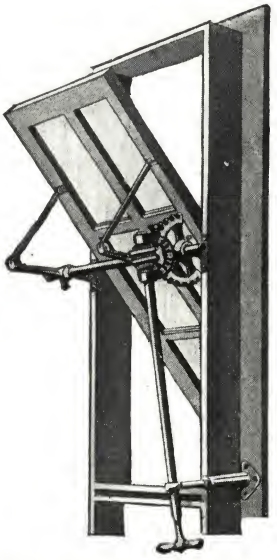
Sizes—Made for standard ½-in. pipe size. Also furnished for ⅜ and 1-in. pipe sizes.

Type "M"—Especially designed for single sashes as it requires no horizontal piping. Also used for skylights having more than one sash where small operator is desired. Particularly suited to concrete as it requires no extensions, eliminating the problem of fastening extensions to concrete walls.

"Fitrite" Bronze Gearing—Is especially recommended (1) for industrial buildings as it resists corrosion due to chemical fumes, acids, etc., (2) for laundries, kitchens or wherever excessive moisture causes iron to rust away. The slight extra cost of "Fitrite" Bronze Gearing assures a permanent trouble-free job.



Type M
"Q" Collar



Comes Completely Assembled or Unassembled as Desired

SPECIFICATIONS FOR "FITRITE" SKYLIGHT GEARING

All skylights shall have movable louvres for ventilation, which shall be operated by pole, hook or chain. Gearing shall be "Fitrite" Skylight Gearing of the proper size and type, as manufactured by David Levow, 308 West 20th Street, New York, N. Y.

HAWTHORNE ROOFING TILE CO.

TELEPHONES
Lawndale 6838
Cicero 72

5850 Ogden Avenue
CICERO, ILL.

TRADE Hawthorne MARK

Hawthorne Roofing Tile—A National Product

Hawthorne Roofing Tile has been developed as a result of years of experience and study of the use of concrete as a roofing material. The originators of this company began with the manufacture of concrete slabs by hand process, which was later discarded and automatic power driven equipment developed to produce a perfect and uniform tile with a permanently embedded color coat.

When the HAWTHORNE ROOFING TILE CO. entered the field with this new type of tile, it began to attract the attention of progressive builders and architects. Because of the cheapness with which the machines could turn out the slabs it became possible for tile to be used where formerly the price had prohibited it. Today Hawthorne Tile is the popular permanent roofing material. This recognition has come only as a result of superior qualities.

Beauty

Hawthorne Tile is beautiful. The impervious surface is always clean; rain washes the dirt off and not in.

It is now possible for the particular architect or builder, with an eye to the combined effect of beautiful materials to select a roof having all the requirements of usage and at the same time becoming a part of a distinctive and pleasing architectural scheme.

Hawthorne Tile is now produced in the following colors:

Dark red	Velvet gray	Orange
Standard green	Blue	Natural gray
Dark green	Bright red	Velvet blue
Yellow	Pea green	Purple
Chocolate	Tan	

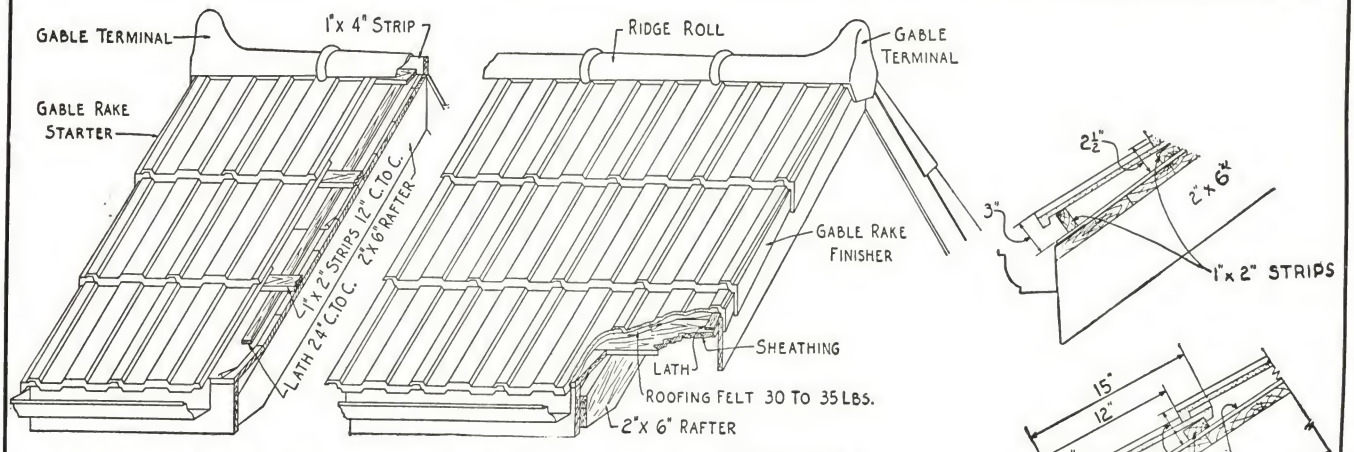
Hawthorne Tile is made in the following styles:

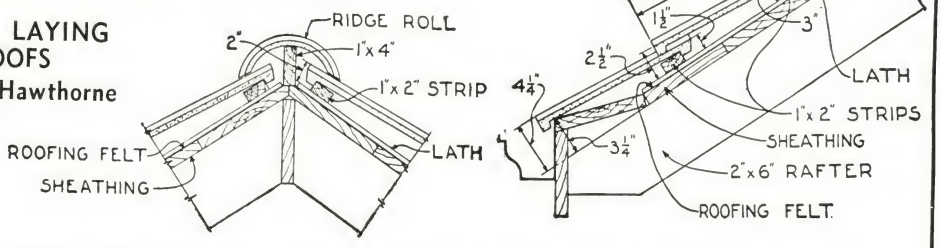
French, Spanish
Closed End Shingle (Chicago only)
Mission (California only)

Suggested Specifications for Use of Architects Specifying Hawthorne Roofing Tile

All sloping roofs shall be covered with Red (or other color or combination of colors) French, Spanish, or Closed End Shingle Hawthorne Roofing Tile of shade or shades approved by the architect and finished with Hawthorne Roofing Tile at the ridges, hips and gables (and eaves in Spanish tile). Specials shall be nailed with copper nails. The tile must be laid in accordance with the Standard Practice of the HAWTHORNE ROOFING TILE CO., which is a part of this specification.

Before laying the tile, roof sheathing shall be covered with an approved slater's asphalted felt weighing not less than 30 pounds per square, securely nailed with flat headed nails, lapped not less than 3 inches at intersections, and doubled at valleys, hips and ridges. Felt at the eaves must be laid over the sheet metal. All sheet metal work shall be installed before tile is laid and all stucco work, pointing or other finish on dormers and other vertical surfaces that rise above the roof shall be completed before the tile laying is started.





STANDARD PRACTICE FOR LAYING HAWTHORNE TILE ROOFS

(Illustration Shows Details of Hawthorne French Roofing Tile)

Hanger strips must be accurately and evenly spaced in order that the courses of the tile may be regular. Before laying strips, roof from eaves to ridge should be measured to determine spacing of hanger strips. French and Spanish Tile are usually laid 12 in. to the weather, but if distance from ridge to eave is not an even number of feet, it will be necessary to slightly increase or decrease this spacing. In no case should this spacing be greater than 12 in.

In hip and ridge detail above a 1x4-in. strip is set vertically to keep the weight of the ridge tile from bearing on the roof tile underneath.

In cases where the pitch of the roof is very flat or very steep the height of this strip should be slightly increased or decreased.

B. MIFFLIN HOOD COMPANY

Manufacturers of Roof and Floor Tiles, Face and Chemical Brick

PLANTS

DAISY, TENN., AND NORWOOD, N. C.

TELEPHONE or TELEGRAPH, County 5606, Chattanooga, Tenn.

BRANCH SALES OFFICES

ATLANTA, GA., 686 Greenwood Avenue, N. E.
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NEW ORLEANS, LA., 406 Maritime Building
NEW YORK, N. Y., Room 412, 103 Park Avenue
NORWOOD, N. C.
PHILADELPHIA, PA., Hood Tile Co., DeLong Building
TAMPA, FLA., 215 So. Rome Avenue

Represented by Leading Roofers, Tile and Brick Dealers in Principal Cities

Products

FLAT SHINGLE ROOF TILE; TRUE MISSION ROOF TILE; TAPERED MISSION ROOF TILE.

Also manufacturers of Brick of standard colors, shapes and textures. Fireplaces, Steps, Briquettes, Landscape Tile, Garden and Terrace Tile, Heavy Traffic Tile, Non-slip Ramps, Brick and Stucco Inserts, Chemical Stoneware, Cylindrical Spiral Rings.

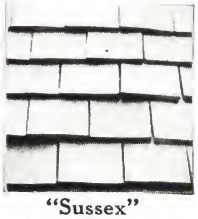
For our Floor Tile page, see Manufacturers' Index.

Hood Kil-Kraft Tiles

"Old Europe"

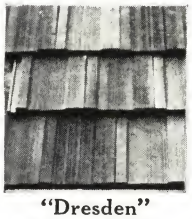
"Rugby"

"Yorkshire"

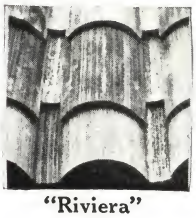


"Sussex"

"Devonshire"

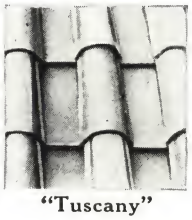


"Dresden"



"Riviera"

"Lombardy"



"Tuscany"

Shingle Tiles

"Old Europe"—Sanded, aged, mellow surface. Reproduced from tiles brought back from Europe.

"Rugby"—Matt, aged. Variety of sizes and thicknesses.

"Yorkshire"—Engobed, subdued reds, aged browns. Capable of wide variation.

"Sussex"—Smooth flat shingle in full range of fireflashed colors.

"Devonshire"—Rugg, fireflashed tans, reds, browns, bronzes and bluish purples. Also made in "Moss Mottle" to simulate moss on old hand riven wood shingles.

"Dresden"—Rugg, full range, fireflashed, flat rib, light weight interlocking.

Curved Tiles

"Riviera"—Smooth or rugg. Full range mingled flashes resembling autumn foliage.

"Habana"—Smooth, sanded or engobe; will grow moss; straight barrel with body of clay. Colors like old hand-made Cuban tiles.

"Lombardy"—Smooth, sanded or engobe, 18-in. tapered. True Italian. Range of cool pastel colors. Vegetating.

"Tuscany"—Smooth, sanded, or engobe, 15 in. flat Roman pans. Reproduced from tiles brought back from Italy and will grow lichen.

Textures—Smooth, matt, rugg, sanded, engobe. Vegetating and non-vegetating.

Specials or Fittings—Necessary authentic fittings furnished with each type. See chart below for size, texture, exposure, weight, etc. Complete data sheets cheerfully furnished on all upon request.

DATA CHART—ROOF TILE

Name	Type	Body	Size, in	Texture	Exposure to weather, in.	Pieces per square	Weight per square, lb.
"Old Europe"	Latin Nordic	Clay and Shale	7x14x½	Hand sanded	5½	385	1750
"Rugby"	Latin Nordic	Clay and Shale	Varied	Matt	Random	Varied	2500
"Yorkshire"	Nordic	Clay and Shale	6x15x½	Engobe	6	415	1700
"Sussex"	Nordic	Clay and Shale	6x15x½	Smooth	6	415	1700
"Devonshire"	Nordic	Clay and Shale	6x15x½	Rugg	6	415	1700
"Dresden"	American Teutonic	Clay and Shale	8x13	Rugg	10	215	1100
"Riviera"	Latin	Clay and Shale	8x15	Smooth Rugg	11	230	1400 and 1150
"Habana"	Latin	Clay and Shale	8x15	Smooth Sanded Engobe	11	230	1400
"Lombardy"	Italian	Clay and Shale	7x18	Smooth Sanded Engobe	15	225	1500
"Tuscany"	Italian pans	Clay and Shale	8x15	Smooth Sanded Engobe	12	130 pans used with 15-in tapered or S. B. covers	

ESTABLISHED 1870

THE GEO. RACKLE & SONS CO.

Manufacturers of Concrete Roof Tile

Station D
CLEVELAND, OHIO

STANDARD DATA ON RACKLE ROOF TILE

Purpose

Precast reinforced concrete slabs have fully justified their acceptance as a roof deck with structural steel support. For over twenty-five years they have been widely used for schools, theaters, churches, factories, stations, warehouses and garages.

Description

There are three general types of concrete roof tile, namely—(a) flat tile, (b) channel tile having two small reinforced concrete beams to support the roof load connected with a lighter slab, and (c) nailing concrete tile which are either flat or channel tile surfaced with a suitable layer of approved nailing concrete. The latter type is used wherever ornamental roof coverings, such as Spanish tile, copper, slate, etc., are required.

Manufacture

Rackle tile are properly reinforced with steel and are composed of concrete containing either gravel or lightweight Haydite aggregate. A process of vibrating is employed in placing the concrete which expels all air voids, permits the use of very low water-cement ratios and produces flawless surfaces. Both the manufacture and erection of Rackle roof tile are performed by workmen of experience.

Specifications

(1) **Strength**—The roof tile shall be compressed of reinforced concrete and equal in quality to those manufactured by The Geo. Rackle & Sons Co., Cleveland, Ohio. Each tile shall be sufficiently strong to support a uniform load of 250 lbs. per square foot 28 days after manufacture, when tested with the maximum span used on the roof.

(2) **Dimensions**—Roofing tile shall have straight, perpendicular edges and true, unwarped surfaces. Outside dimensions shall correspond accurately to the sizes shown on the plans. All cracked or broken tile shall be rejected.

(3) **Tile Details**—The concrete tile contractor shall design and submit concrete roof tile details to the architect for approval. These details are to be based upon the roof plans and details of the architect and steel fabricator. Manufacture of tile of special size or shape shall not be started until approval of the details submitted.

(4) **Notification**—The general contractor shall notify the concrete tile contractor one week in advance that the roof will be ready for the application of tile.

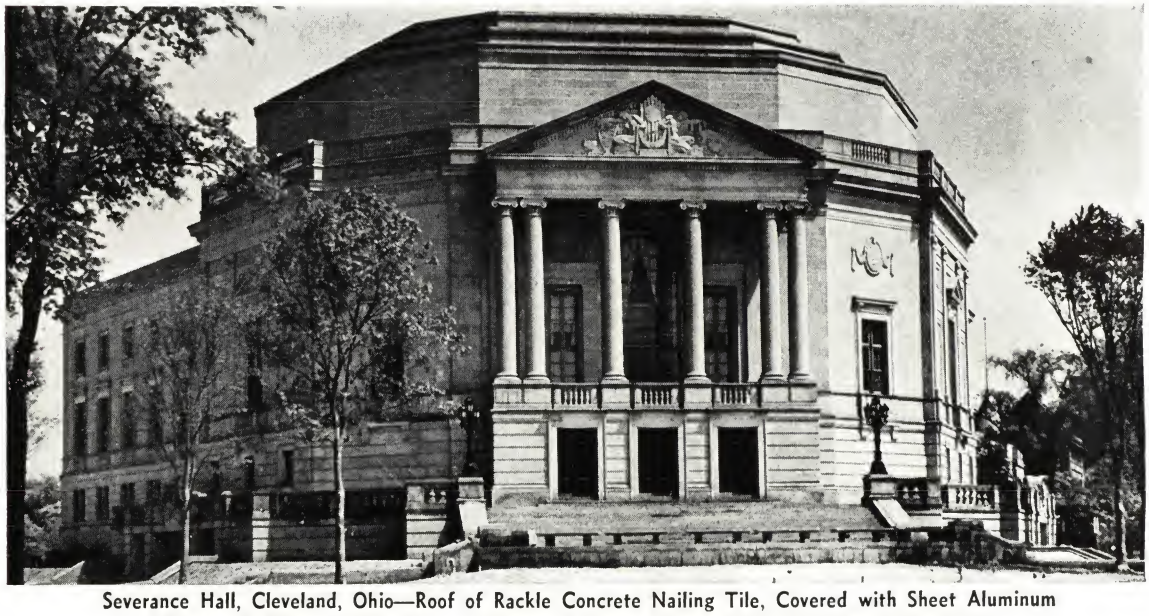
(5) **Erection**—All tile are to be erected in a thoroughly workmanlike manner. Joints are to be pointed with mastic cement. The completed work must present a smooth surface, ready for the application of the composition or ornamental covering.

Other Products

For our page on Artstone, a precast concrete building material, see Manufacturers' Index, and Macotta, a metal-covered concrete, see Products Index.

DETAILS OF RACKLE ROOF TILE

Type of tile	Standard length	Absolute max. length	Thickness	Width	Weight per sq. ft., gravel	Weight per sq. ft. Haydite
Flat	5 ft. 0 in.	5 ft. 6 in.	1½ in.	2 ft. 0 in.	17 lbs.	12 lbs.
Flat	5 ft. 6 in.	6 ft. 0 in.	1¾ in.	2 ft. 0 in.	20 lbs.	15 lbs.
Flat	5 ft. 6 in.	6 ft. 6 in.	2 in.	2 ft. 0 in.	23 lbs.	18 lbs.
Channel	6 ft. 0 in.	6 ft. 8 in.	2¾ in.	2 ft. 0 in.	15 lbs.	11 lbs.
Channel	6 ft. 8 in. to 8 ft. 0 in.	8 ft. 0 in.	3¾ in.	1 ft. 6 in.	18 lbs.	14 lbs.



Severance Hall, Cleveland, Ohio—Roof of Rackle Concrete Nailing Tile, Covered with Sheet Aluminum
Walker & Weeks, Architects Crowell & Little Construction Co., General Contractor

LUDOWICI TILES

A SERIES OF SPECIFICATIONS
AND DETAILS FOR ROOFING TILES, TILE SLABS,
CHIMNEY POTS AND FLOOR TILES

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Tiles*

CHICAGO
104 SOUTH MICHIGAN AVENUE

NEW YORK
565 FIFTH AVENUE

ATLANTA
823 FORSYTH BUILDING

OKLAHOMA CITY
614 MERCANTILE BUILDING

WASHINGTON
738 FIFTEENTH STREET, N. W.

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Chimney Pots*

CHICAGO, 104 South Michigan Avenue

NEW YORK, 565 Fifth Avenue — ATLANTA, 823 Forsyth Bld'g.

OKLAHOMA CITY, 614 Mercantile Bld'g. — WASHINGTON, 738 Fifteenth Street, N. W.

Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

CHIMNEY POTS

Chimney pots are made in various textures and colors especially adapted to use with our weathered effect tiles. They are also available in glazed colors for modernistic treatment.

C.P.200

C.P.400, 410 and 420

C.P.500, 510 and 520

C.P.600, 610, 620, 630, 640, 650 and 660

SCHEDULE OF SIZES

NUMBER	FLUE	BASE	HEIGHT
C.P.200	7½"x7½"	13 "x13"	15"
C.P.300	8 " Dia.	14 "	18"
C.P.310	12 " Dia.	18 "	21"
C.P.320	15 " Dia.	21 "	25"
C.P.400	8 " Dia.	14½"	25"
C.P.410	12 " Dia.	18½"	29"
C.P.420	15 " Dia.	21 "	32"
C.P.500	8 " Dia.	14 "	15"
C.P.510	12 " Dia.	18 "	18"
C.P.520	15 " Dia.	21 "	22"
C.P.600	10 " Dia.	13 "	15"
C.P.610	12 " Dia.	15 "	18"
C.P.620	15 " Dia.	18 "	20"
C.P.630	18 " Dia.	21½"	23"
C.P.640	23 " Dia.	26 "	30"
*C.P.650	8 "x12"	11 "x15"	20"
*C.P.660	12 "x17"	15 "x20"	30"

*Elliptical

C.P.300, 310 and 320

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Roofing Tiles*

CHICAGO, 104 South Michigan Avenue

NEW YORK, 565 Fifth Avenue — ATLANTA, 823 Forsyth Bld'g.

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ROOFING TILES

Produced since 1875.

Hard burned to afford enduring protection under the most severe weather conditions encountered.

Our nearest sales office will furnish samples or give information as to where displays or typical installations may be seen. Photographs of representative work on request.

Estimates promptly furnished from architect's plans and specifications.

Experienced service available for assistance in solving difficult roofing problems.

We are singularly well equipped to furnish tiles of quality. Our manufacture is carried on where the raw material is peculiarly adapted to the purpose; our plants are equipped with modern machinery; our research department develops methods for producing both modern and ancient effects at minimum cost. Large output and flexible production assure service on all operations.

Variety of product affords wide latitude in accomplishing pleasing roof effects.

Shingle tiles are produced in a variety of sizes, colors and textures. Brittany Shingles may be so applied as faithfully to resemble ancient roofs of burned clay or stone, which are so interesting to the traveller in France and England. Crude Shingles are moulded duplicates of early original French tiles. Antique Shingles, more irregular, are ideal for the low rambling English design country house. Colonial Shingles, in texture and color, are remarkably like old split wood shingles. The Provincial Shingle, an inexpensive yet artistic pattern, is used in its dull-colored and weathered effects to subdue the roof, or in a range of brighter tones to give it accent. Yale Memorial tiles, as used on the Harkness Memorial Quadrangle at Yale University, on the New Duke University group, and other prominent buildings, especially lend themselves to the furthering of individual expression in a conservative manner.

Closed Shingle, English Shingle, French, Mission, Spanish, Roman and Greek tiles are offered in natural reds and fireflashed shades, or glazed in practically any color. They are also produced in various textures, including weathered surface effects.

SHOW ROOMS

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DETROIT
Barlum Tower, Cadillac Square

ST. LOUIS
Arcade Building

CLEVELAND
Builders Exchange Building

NEW YORK
101 Park Avenue

BROOKLYN
Brooklyn Daily Eagle Building

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LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Roofing Tiles*

CHICAGO, 104 South Michigan Avenue

NEW YORK, 565 Fifth Avenue — ATLANTA, 823 Forsyth Bld'g.

OKLAHOMA CITY, 614 Mercantile Bld'g. — WASHINGTON, 738 Fifteenth Street, N. W.

Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

SHINGLE TILES

These patterns are available in a range of colors in a variety of surface textures

SPECIFICATIONS

Note: *Notes are explanatory or advisory only and should not be included in the specifications.*

Note: *Words in italics enclosed within parentheses are selective to suit particular condition. Include or omit as required.*

Note: *Clauses are selective. Include or omit as they apply.*

(1) Tiles

(1a) Cover roofs so indicated with Ludowici-Celadon Company's (*specify pattern*) Shingle tiles and fittings of (*specify*) color.

(1b) (*Hips*) (*and*) (*valleys*) shall be cut at time of application.

(2) Nails

All nails for flashings and tiles shall be copper.

(3) Felt

(3a) Lay asphalt felt weighing 30 lbs. per square, doubled on (*low pitches*) (*rough surfaces*) (*hips*) (*valleys*) (*and*) ridges. Lay parallel to eaves. Lap 2½″ horizontally and 6″ vertically. Fasten with large-headed galvanized nails.

(3b) Extend felt (6″ *up vertical walls*) (*and*) 4″ over (*gutter*) (*and*) (*valley*) metal.

(4) Wood Strips

(4a) Provide ¾″ x 1″ cant strips at eaves and 1″ stringers of necessary height under (*hip rolls and*) ridges.

(4b) Embed parallel with the pitch on 20″ centers 1″ x 2″ beveled wood strips flush with surface of concrete. Fasten felt with lath nailed over these strips. At right angles to embedded strips, over lath, install 1″ x 2″ strips spaced to suit tiles.

Note: *Include* (4b) *if roof base is concrete.*

(5) Flashings

(5a) At sides of vertical surfaces, insert base flashing between each course of tiles. Lap 3″ and extend 4″ under tiles and at least 6″ up wall.

(5b) At fronts, extend flashing at least 3″ up wall and 4″ over tiles.

(5c) Masonry wall shall be cap flashed and pointed.

(5d) Where tile and metal roofs intersect, extend metal up tile roof 12″ or more.

(5e) Extend gutter metal up roof to a point higher than outer edge of gutter.

(5f) **Open Valleys**—Line valleys with 16 oz. copper at least 20″ wide. Turn edge over ¼″. Lap joints at least 4″. Fasten with cleats. Do not solder.

(5g) **Closed Valleys**—Flash between each course of tiles with 16″ strips of same length as tiles.

(5h) **Rounded Valleys**—Flash between each course of tiles with curved strips of same length as tiles. Extend strips 8″ beyond the curve at either side of valley.

(6) Laying

(6a) Lay tiles (*regular*) (*irregular*) with (*specify*) average exposure and not less than 2″ head lap on the third course. Double tiles at eave. Fasten with (1½″) (1¾″) (*specify*) copper nails. Fasten tiles overlapping sheet metal with copper wire and elastic cement.

Note: *Select whether regular or irregular and specify 1½″ nails for ⅜″ shingles; 1¾″ nails for ⅝″ shingles; longer for thicker shingles.*

(6b) Leave opening of 6″ or more across valleys.

(6c) Cement end bands in laps.

(6d) Cement hip rolls in laps and fasten with 2″ copper nails.

(6e) Cement ridges in laps and fasten with 2½″ copper nails.

(6f) Where tiles join hip stringers make waterproof with elastic cement.

(6g) Cement small pieces of graduated tiles solidly with elastic cement.

Note: *Include* (6g) *on circular roofs.*

(6h) Cement all tiles in laps, using 30 lbs. of elastic cement per square.

Note: *Include* (6h) *on high buildings.*

Details concerning any roofing problem furnished on request.
If additional copies of this catalogue are desired, please write.

LUDOWICI SHINGLE TILES

PROVINCIAL

Length	15 ″
Width	7 ″
Thickness	$\frac{1}{2}$″
Average exposure	7″x6$\frac{1}{2}$″
Average pieces per square	317
Average weight per square	1270 lbs.

BRITTANY

Length	12 ″
Width	7 ″
Thickness	$\frac{5}{8}$″
Average exposure	7″x5 ″
Average pieces per square	412
Average weight per square	1610 lbs.

LUDOWICI SHINGLE TILES

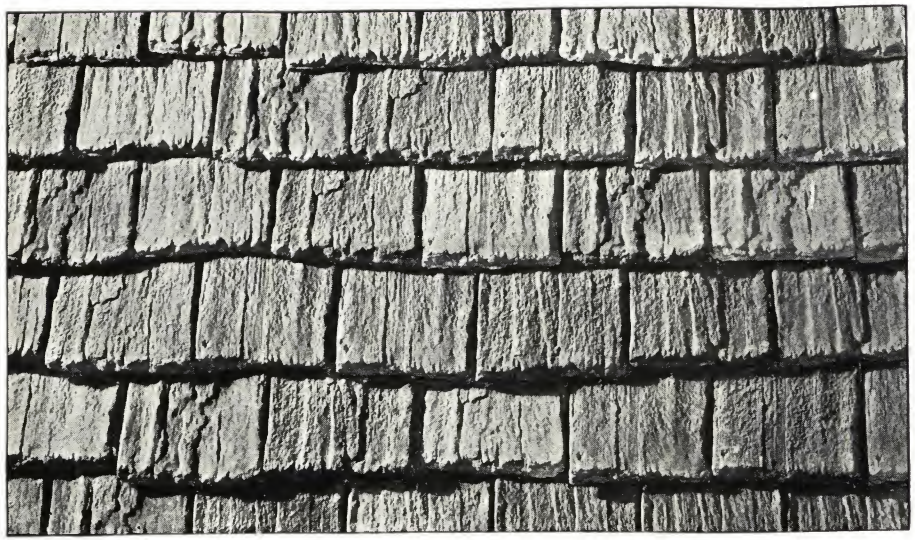
ANTIQUE

Length	12 ″
Width	7 ″
Thickness	$\frac{9}{16}$ ″
Average exposure	7″x5″
Average pieces per square	412
Average weight per square	1490 lbs.

CRUDE

Length	12 ″
Width	$6\frac{1}{4}$ ″
Thickness	$\frac{5}{8}$ ″
Average exposure	$6\frac{1}{4}$″x5″
Average pieces per square	460
Average weight per square	1750 lbs.

LUDOWICI SHINGLE TILES



COLONIAL

Length	15 ″
Width	7 ″
Thickness	$\frac{5}{8}$″
Average exposure	7″x6$\frac{1}{2}$″
Average pieces per square	317
Average weight per square	1560 lbs.

YALE MEMORIAL

Lengths	12″, 14″, 16″
Widths	6″, 7″, 8″
Thicknesses	$\frac{5}{8}$″, $\frac{3}{4}$″, 1″

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Roofing Tiles*

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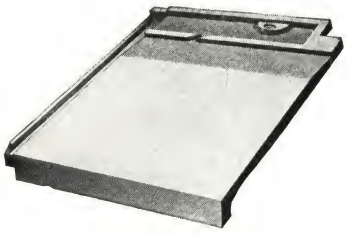
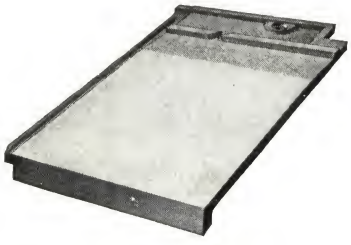
Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

INTERLOCKING SHINGLE TILES



CLOSED SHINGLE

These patterns are available in a range of colors in a variety of surface textures.



ENGLISH SHINGLE

SPECIFICATIONS

Note: *Notes are explanatory or advisory only and should not be included in the specifications.*
Note: *Words in italics enclosed within parentheses are selective to suit particular condition. Include or omit as required.*
Note: *Clauses are selective. Include or omit as they apply.*

(1) Tiles

(1a) Cover roofs so indicated with Ludowici-Celadon Company's (*Closed*) (*English*) Shingle tiles and fittings of (*specify*) color.

(1b) (*Hips*) (*and*) (*valleys*) shall be cut before burning.

(2) Nails

All nails for flashings and tiles shall be copper.

(3) Felt

(3a) Lay asphalt felt weighing 30 lbs. per square, doubled on (*low pitches*) (*rough surfaces*) (*hips*) (*valleys*) (*and*) ridges. Lay parallel to eaves. Lap 2½″ horizontally and 6″ vertically. Fasten with large-headed galvanized nails.

(3b) Extend felt (6″ *up vertical walls*) (*and*) 4″ over (*gutter*) (*and*) (*valley*) metal.

(4) Wood Strips

(4a) Provide ⅞″ x 1″ cant strips at eaves.

Note: *Include* (4a) *if English Shingles are specified.*

(4b) Provide 1″ stringers of necessary height under (*hip rolls and*) ridges.

(4c) Embed parallel with the pitch on 20″ centers 1″ x 2″ beveled wood strips flush with surface of concrete. Fasten felt with lath nailed over these strips. At right angles to embedded strips, over lath, install 1″ x 2″ strips spaced to suit tiles.

Note: *Include* (4c) *if roof base is concrete.*

(5) Flashings

(5a) Line valleys with 16 oz. copper at least 20″ wide. Turn edge over ¼″. Lap joints at least 4″. Fasten with cleats. Do not solder.

(5b) At sides of vertical surfaces, extend base flashing at least 6″ up wall, 5″ under tiles and turn up edge ½″.

(5c) At fronts, extend flashing at least 3″ up wall and 4″ over tiles.

(5d) Masonry wall shall be cap flashed and pointed.

(5e) Where tile and metal roofs intersect, extend metal up tile roof 12″ or more.

(5f) Extend gutter metal up roof to a point higher than outer edge of gutter.

(6) Laying

(6a) Lay tiles to straight lines, parallel and at right angles to eaves, lapped 3″. Fasten with 2″ copper nails. Fasten tiles overlapping sheet metal with copper wire and elastic cement.

(6b) Leave opening of 6″ or more across valleys.

(6c) Cement gable rakes to field tiles and fasten with 2″ copper nails.

(6d) Cement hip rolls in laps and fasten with 2″ copper nails.

(6e) Cement ridges in laps and fasten with 2½″ copper nails.

(6f) Where tiles join hip stringers make waterproof with elastic cement.

(6g) Cement small pieces of graduated tiles solidly with elastic cement.

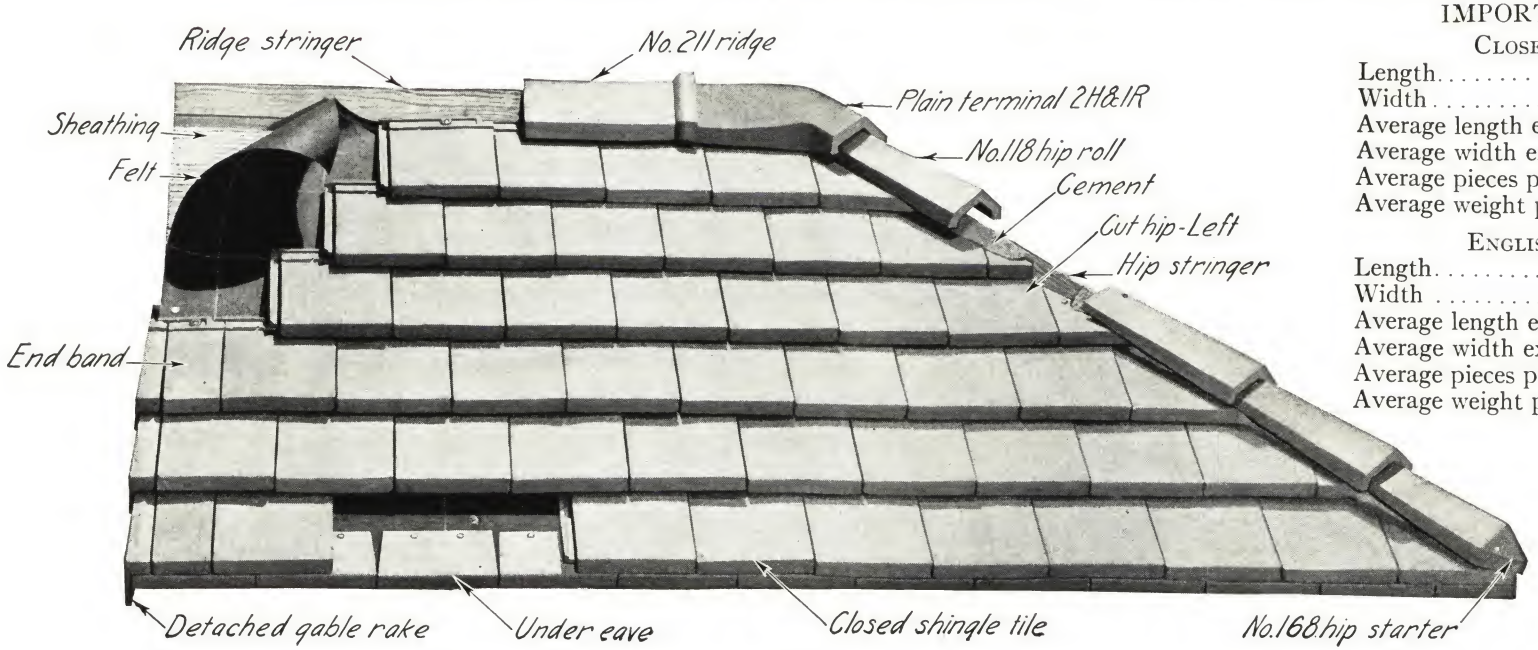
Note: *Include* (6g) *on circular roofs.*

(6h) Cement all tiles in laps, using 30 lbs. of elastic cement per square.

Note: *Include* (6h) *on high buildings.*

Details concerning any roofing problem furnished on request.
If additional copies of this catalogue are desired, please write.

DETAILS OF LUDOWICI INTERLOCKING SHINGLE TILES



IMPORTANT DATA

Closed Shingle

Length	11 ″
Width	$8\frac{3}{4}$ ″
Average length exposure	8 ″
Average width exposure	8 ″
Average pieces per square	225
Average weight per square	800 lbs.

English Shingle

Length	$13\frac{1}{4}$ ″
Width	$8\frac{3}{4}$ ″
Average length exposure	$10\frac{1}{8}$ ″
Average width exposure	$7\frac{3}{4}$ ″
Average pieces per square	182
Average weight per square	900 lbs.

CORRECT RAFTER LENGTHS FOR FULL LENGTH TILES

Based on 2″ projection at eave of roof.

Course	Closed Shingle	English Shingle
1	9″	$11\frac{1}{4}$ ″
2	17″	$21\frac{3}{8}$ ″
3	25″	$31\frac{1}{2}$ ″
4	33″	$41\frac{5}{8}$ ″
5	41″	$51\frac{3}{4}$ ″
6	49″	$61\frac{7}{8}$ ″
7	57″	72 ″
8	65″	$82\frac{1}{8}$ ″
9	73″	$92\frac{1}{4}$ ″
10	81″	$102\frac{3}{8}$ ″
11	89″	$112\frac{1}{2}$ ″

HIP AND RIDGE STRINGER HEIGHTS

Roof Pitch	Closed Shingle Hip No. 118	Closed Shingle Ridge No. 211	English Shingle Hip No. 120	English Shingle Ridge No. 211
4″ Rise to 12″ Run	$2\frac{7}{8}$ ″	$3\frac{1}{8}$ ″	$3\frac{1}{4}$ ″	3 ″
5″ Rise to 12″ Run	$2\frac{7}{8}$ ″	$2\frac{7}{8}$ ″	$3\frac{1}{4}$ ″	$2\frac{3}{4}$ ″
6″ Rise to 12″ Run	$2\frac{7}{8}$ ″	$2\frac{5}{8}$ ″	$3\frac{1}{8}$ ″	$2\frac{1}{2}$ ″
7″ Rise to 12″ Run	$2\frac{3}{4}$ ″	$2\frac{3}{8}$ ″	$3\frac{1}{8}$ ″	$2\frac{1}{4}$ ″
8″ Rise to 12″ Run	$2\frac{3}{4}$ ″	$2\frac{1}{8}$ ″	$3\frac{1}{8}$ ″	2 ″
9″ Rise to 12″ Run	$2\frac{3}{4}$ ″	$1\frac{7}{8}$ ″	3 ″	$1\frac{3}{4}$ ″
10″ Rise to 12″ Run	$2\frac{5}{8}$ ″	$1\frac{5}{8}$ ″	3 ″	$1\frac{1}{2}$ ″
11″ Rise to 12″ Run	$2\frac{5}{8}$ ″	$1\frac{3}{8}$ ″	3 ″	$1\frac{1}{8}$ ″
12″ Rise to 12″ Run	$2\frac{5}{8}$ ″	$1\frac{1}{8}$ ″	3 ″	1 ″
13″ Rise to 12″ Run	$2\frac{5}{8}$ ″	$\frac{7}{8}$ ″	$2\frac{7}{8}$ ″	$\frac{7}{8}$ ″
14″ Rise to 12″ Run	$2\frac{5}{8}$ ″	$\frac{5}{8}$ ″	$2\frac{7}{8}$ ″	$\frac{3}{4}$ ″

Ludowici-Celadon Company A789

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Roofing Tiles*

CHICAGO, 104 South Michigan Avenue

NEW YORK, 565 Fifth Avenue — ATLANTA, 823 Forsyth Bld'g.

OKLAHOMA CITY, 614 Mercantile Bld'g. — WASHINGTON, 738 Fifteenth Street, N. W.

Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

FRENCH TILES

This pattern is available in a range of colors

SPECIFICATIONS

Note: *Notes are explanatory or advisory only and should not be included in the specifications.*

Note: *Words in italics enclosed within parentheses are selective to suit particular condition. Include or omit as required.*

Note: *Clauses are selective. Include or omit as they apply.*

(1) Tiles

(1a) Cover roofs so indicated with Ludowici-Celadon Company's French tiles and fittings of (*specify*) color.

(1b) (*Hips*) (*and*) (*valleys*) shall be cut before burning.

(2) Nails

All nails for flashings and tiles shall be copper.

(3) Felt

(3a) Lay asphalt felt weighing 30 lbs. per square, doubled on (*low pitches*) (*rough surfaces*) (*hips*) (*valleys*) (*and*) ridges. Lay parallel to eaves. Lap 2½″ horizontally and 6″ vertically. Fasten with large-headed galvanized nails.

(3b) Extend felt (6″ *up vertical walls*) (*and*) 4″ over (*gutter*) (*and*) (*valley*) metal.

(4) Wood Strips

(4a) Provide 1½″x2″ cant strips at eaves and 1″ stringers of necessary height under (*hip rolls and*) ridges.

(4b) Embed parallel with the pitch on 20″ centers 1″ x 2″ beveled wood strips flush with surface of concrete. Fasten felt with lath nailed over these strips. At right angles to embedded strips, over lath, install 1″ x 2″ strips spaced to suit tiles.

Note: *Include* (4b) *if roof base is concrete.*

(5) Flashings

(5a) Line valleys with 16 oz. copper at least 20″ wide. Turn edge over ¼″. Lap joints at least 4″. Fasten with cleats. Do not solder.

(5b) At sides of vertical surfaces, extend base flashing at least 6″ up wall, 5″ under tiles and turn up edge ½″.

(5c) At fronts, extend flashing at least 3″ up wall and 4″ over tiles.

(5d) Masonry wall shall be cap flashed and pointed.

(5e) Where tile and metal roofs intersect, extend metal up tile roof 12″ or more.

(5f) Extend gutter metal up roof to a point higher than outer edge of gutter.

(6) Laying

(6a) Lay tiles to straight lines, parallel and at right angles to eaves, lapped 3″. Fasten with 2½″ copper nails. Fasten tiles overlapping sheet metal with copper wire and elastic cement.

(6b) Leave opening of 6″ or more across valleys.

(6c) Cement gable rakes to field tiles and fasten with 2″ copper nails.

(6d) Cement hip rolls in laps and fasten with 2″ copper nails.

(6e) Cement ridges in laps and fasten with 2½″ copper nails.

(6f) Where tiles join hip stringers make waterproof with elastic cement.

(6g) Cement small pieces of graduated tiles solidly with elastic cement.

Note: *Include* (6g) *on circular roofs.*

(6h) Cement all tiles in laps, using 40 lbs. of elastic cement per square.

(6i) Copper clamp shall be placed in side lock of each tile at point directly above head of tile below. Nail clamp to roof base.

Note: *Include either* (6h) *or* (6i) *on high buildings.*

Details concerning any roofing problem furnished on request.
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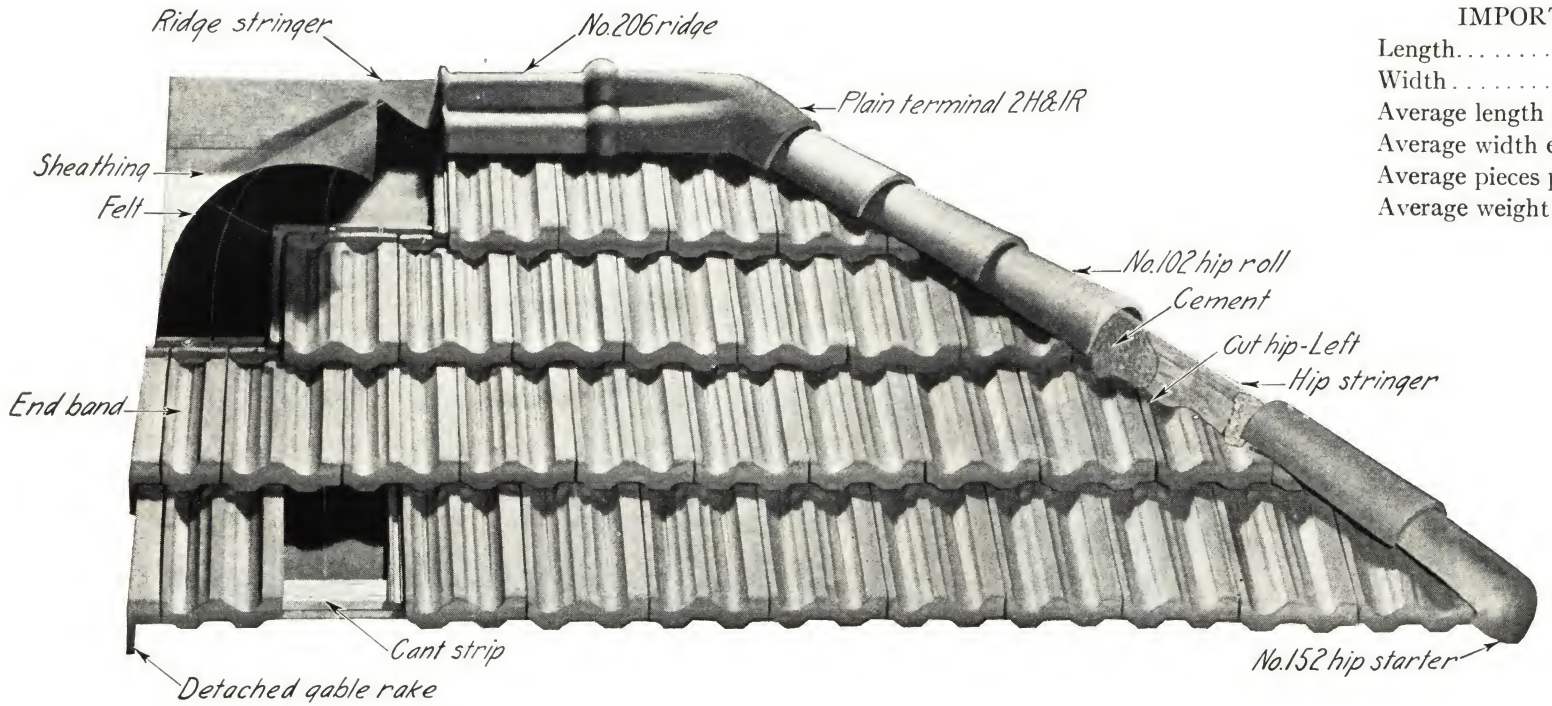
DETAILS OF LUDOWICI FRENCH TILES



IMPORTANT DATA

Length	$16\frac{1}{4}$″
Width	9 ″
Average length exposure	$13\frac{3}{8}$″
Average width exposure	$8\frac{1}{8}$″
Average pieces per square	133
Average weight per square	840 lbs.

CORRECT RAFTER LENGTHS FOR FULL LENGTH TILES

Based on 2″ projection at eave of roof.

COURSE	RAFTER
1	14 ″
2	$27\frac{3}{8}$″
3	$40\frac{3}{4}$″
4	$54\frac{1}{8}$″
5	$67\frac{1}{2}$″
6	$80\frac{7}{8}$″
7	$94\frac{1}{4}$″
8	$107\frac{5}{8}$″
9	121 ″
10	$134\frac{3}{8}$″

HIP AND RIDGE STRINGER HEIGHTS

ROOF PITCH	HIP NO. 102	RIDGE NO. 206
4″ Rise to 12″ Run	$4\frac{3}{4}$″	$5\frac{1}{4}$″
5″ Rise to 12″ Run	$4\frac{5}{8}$″	5 ″
6″ Rise to 12″ Run	$4\frac{5}{8}$″	$4\frac{3}{4}$″
7″ Rise to 12″ Run	$4\frac{1}{2}$″	$4\frac{1}{2}$″
8″ Rise to 12″ Run	$4\frac{1}{2}$″	$4\frac{1}{4}$″
9″ Rise to 12″ Run	$4\frac{3}{8}$″	4 ″
10″ Rise to 12″ Run	$4\frac{3}{8}$″	$3\frac{3}{4}$″
11″ Rise to 12″ Run	$4\frac{1}{4}$″	$3\frac{1}{2}$″
12″ Rise to 12″ Run	$4\frac{1}{4}$″	$3\frac{1}{4}$″
13″ Rise to 12″ Run	$4\frac{1}{8}$″	3 ″
14″ Rise to 12″ Run	$4\frac{1}{8}$″	$2\frac{7}{8}$″
15″ Rise to 12″ Run	$4\frac{1}{8}$″	$2\frac{5}{8}$″

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MISSION TILES

These patterns are available in a range of colors in a variety of surface textures

SPECIFICATIONS

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Note: *Clauses are selective. Include or omit as they apply.*

(1) Tiles

(1a) Cover roofs so indicated with Ludowici-Celadon Company's (*specify pattern*) Mission Tiles and fittings of (*specify*) color.

(1b) Covers shall be used as (*hip roll and*) ridge.

(1c) (*Hips shall be cut*) (*and*) valleys shall be cut and closed before burning.

(2) Nails

All nails for flashings and tiles shall be copper.

(3) Felt

(3a) Lay asphalt felt weighing 30 lbs. per square, doubled on (*low pitches*) (*rough surfaces*) (*hips*) (*valleys*) (*and*) ridges. Lay parallel to eaves. Lap 2½″ horizontally and 6″ vertically. Fasten with large-headed galvanized nails.

(3b) Extend felt (6″ *up vertical walls*) (*and*) 4″ over (*gutter*) (*and*) (*valley*) metal.

(4) Wood Strips

(4a) Provide 1″ strips of necessary height under covers (*hip rolls*) and ridges.

(4b) Embed parallel with the pitch on 20″ centers 1″ x 2″ beveled wood strips flush with surface of concrete. Fasten felt with lath nailed over these strips. At right angles to embedded strips, over lath, install 1″ x 2″ strips spaced to suit pan tiles.

Note: *Include* (4b) *if roof base is concrete.*

(5) Flashings

(5a) Line valleys with 16 oz. copper at least 20″ wide. Turn edge over ¼″. Lap joints at least 4″. Fasten with cleats. Do not solder.

(5b) At sides of vertical surfaces, extend base flashing at least 6″ up wall, 4″ under tiles and turn up edge 2″.

(5c) At fronts, extend flashing at least 3″ up wall and 4″ over tiles.

(5d) Masonry wall shall be cap flashed and pointed.

(5e) Where tile and metal roofs intersect, extend metal up tile roof 12″ or more.

(5f) Extend gutter metal up roof to a point higher than outer edge of gutter.

(6) Laying

(6a) Lay tiles (*regular*) (*irregular*) exposure with not less than 3″ lap. Fasten with 2″ copper nails. Fasten tiles overlapping sheet metal with copper wire and elastic cement.

(6b) **Irregular Effect**—Lay pans at actual exposure. Vary exposures of covers to avoid horizontal and diagonal lines using 10% additional covers.

(6c) Leave opening of 6″ or more across valleys.

(6d) Cement gable rakes to field tiles and fasten with 2½″ copper nails.

(6e) Cement (*hip rolls*) (*and*) (*ridges*) in laps and fasten with 2½″ copper nails.

(6f) Where tiles join hip stringers make waterproof with elastic cement.

(6g) Cement small pieces of graduated tiles solidly with elastic cement.

Note: *Include* (6g) *on circular roofs.*

(6h) Cement all tiles in laps, using 30 lbs. of elastic cement per square.

Note: *Include* (6h) *on high buildings.*

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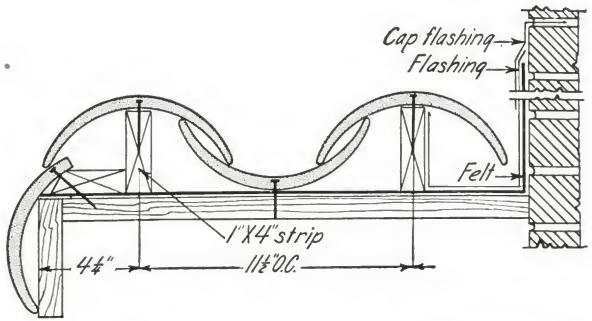
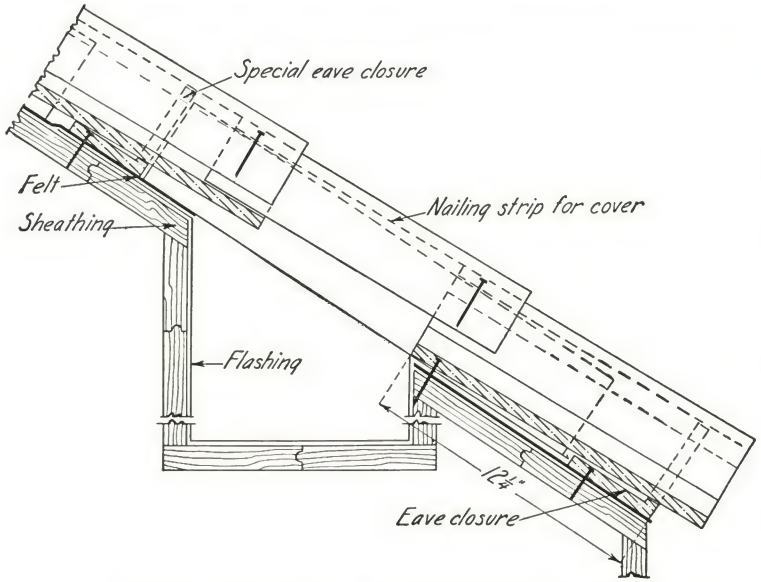
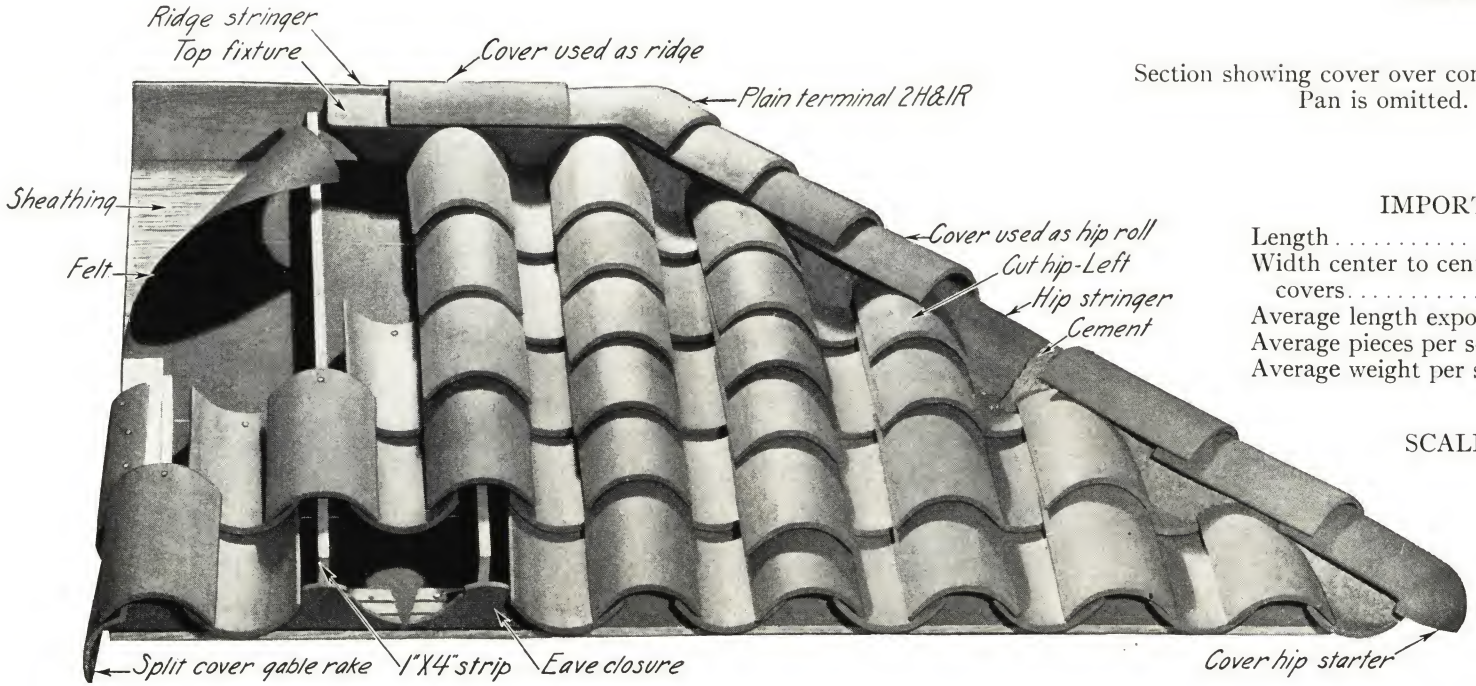
DETAILS OF LUDOWICI
STRAIGHT BARREL MISSION TILES AND FITTINGS



Section showing split cover gable rake, also flashing under side of tiles.



Section showing cover over concealed gutter.
Pan is omitted.

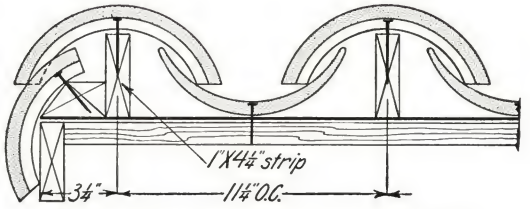


IMPORTANT DATA

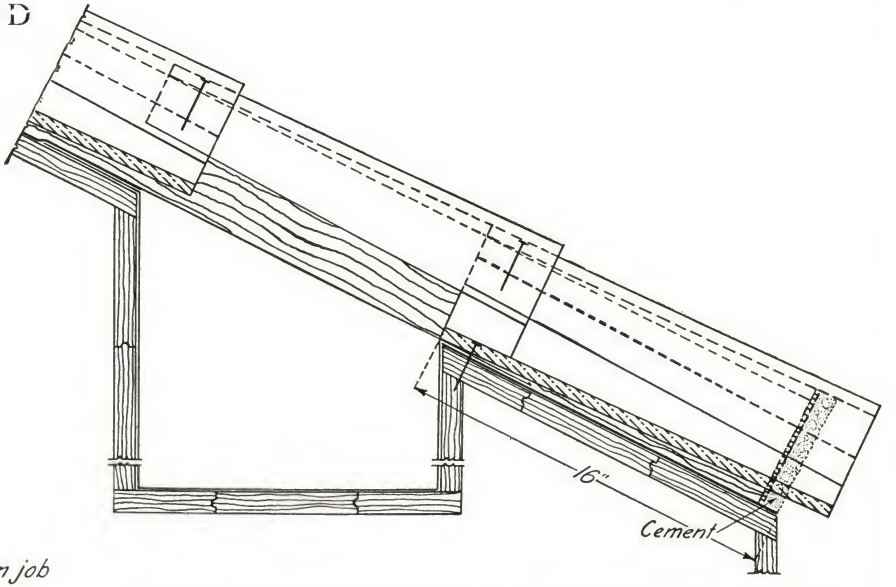
Length	$14\frac{1}{4}$"	18 "
Width center to center of covers	$11\frac{1}{2}$"	$11\frac{1}{2}$"
Average length exposure	$11\frac{1}{4}$"	15 "
Average pieces per square	224	170
Average weight per square	1200 lbs.	1200 lbs.

SCALE $1\frac{1}{2}$" = 1'-0"

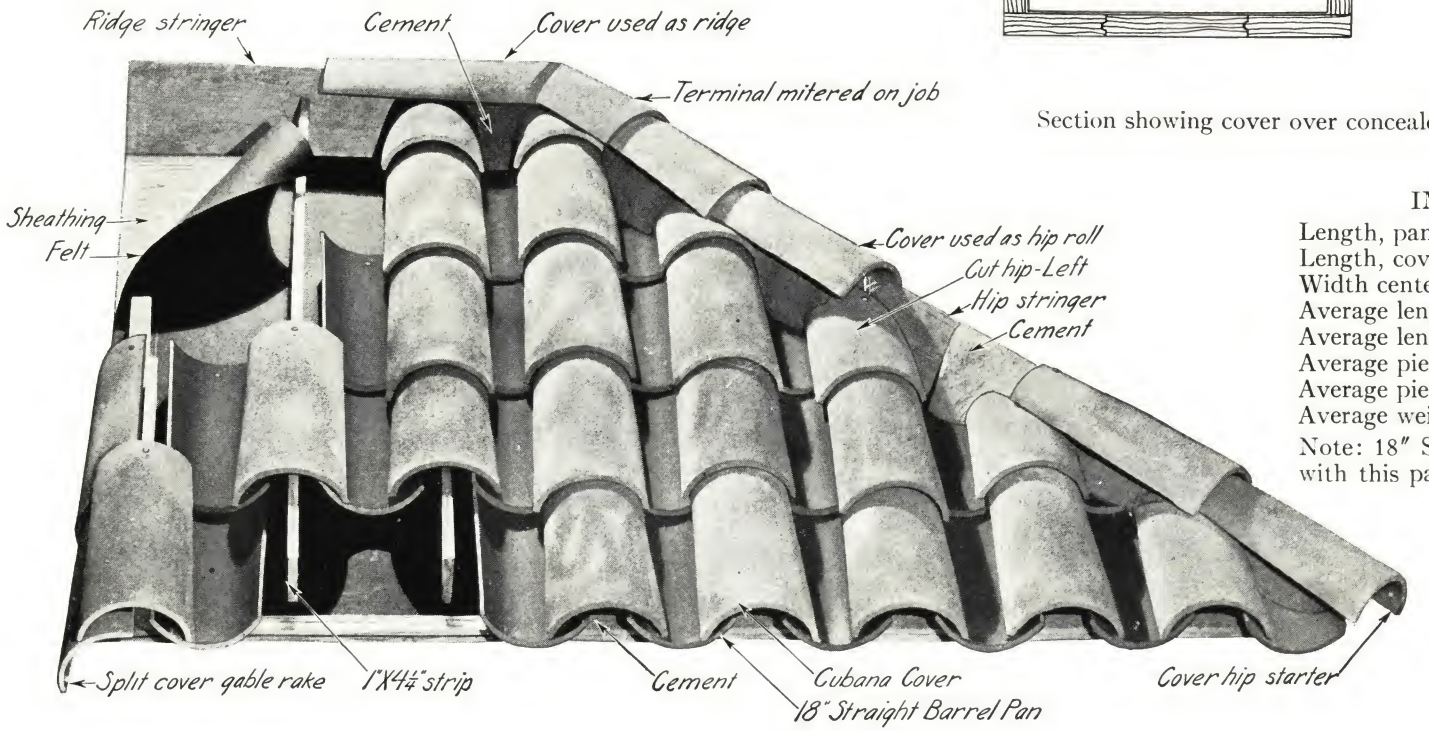
DETAILS OF LUDOWICI 18″ CUBANA TAPERED MISSION TILES AND FITTINGS



Section showing split cover gable rake.



Section showing cover over concealed gutter. Pan is omitted.



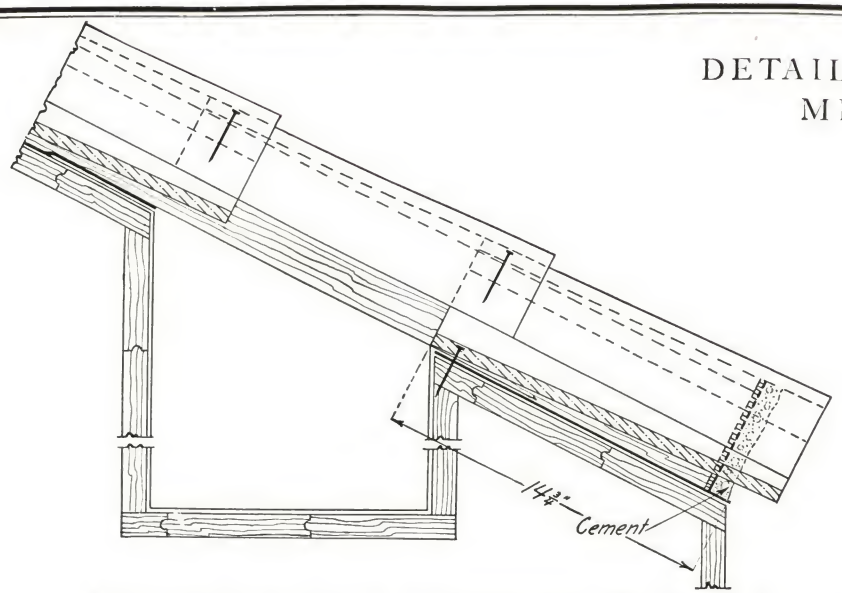
IMPORTANT DATA

Length, pan	18 ″
Length, cover	18 ″
Width center to center of covers	11¼″
Average length exposure, pans	15 ″
Average length exposure, covers	15 ″
Average pieces per square, pans	85
Average pieces per square, covers	85
Average weight per square	1280 lbs.

Note: 18″ Straight Barrel pans furnished with this pattern.

SCALE 1½″ = 1′-0″

DETAILS OF LUDOWICI LARGE TAPERED MISSION TILES AND FITTINGS



Section showing cover over concealed gutter. Pan is omitted.

NOTE: When 18″ Straight Barrel pans are used, distance below gutter should be 16″.

IMPORTANT DATA

LARGE TAPERED PANS AND COVERS

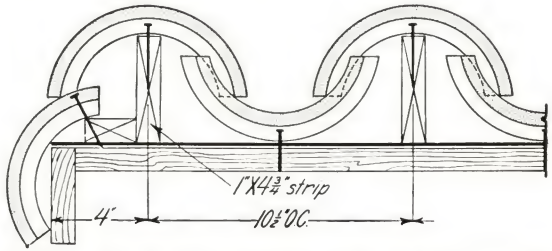
Length	16¾″
Width center to center of covers	10½″
Average length exposure	13¾″
Average pieces per square	200
Average weight per square	1450 lbs.

LARGE TAPERED COVERS AND 18″ STRAIGHT BARREL PANS

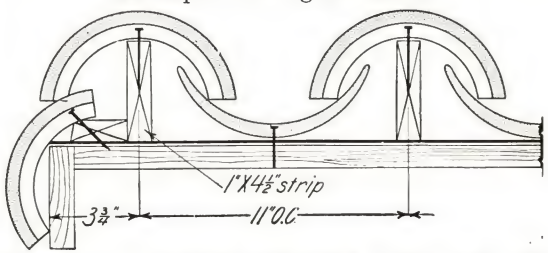
Length, pan	18 ″
Length, cover	16¾″
Width center to center of covers	11 ″
Average length exposure, pans	15 ″
Average length exposure, covers	13¾″
Average pieces per square, pans	87
Average pieces per square, covers	95
Average weight per square	1300 lbs.

SCALE 1½″ = 1′-0″

Large Tapered pans and covers.



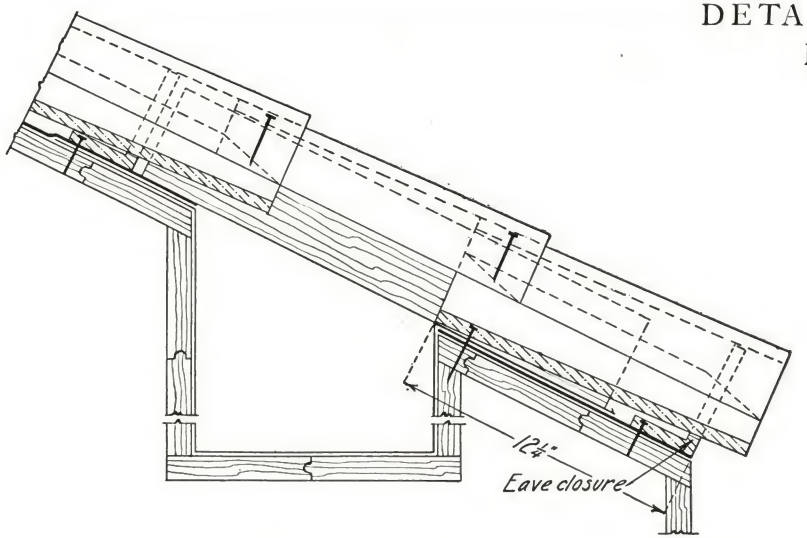
Section showing Large Tapered pans and covers, also split cover gable rake.



Section showing Large Tapered covers with 18″ Straight Barrel pans, also split cover gable rake.

Large Tapered covers and Straight Barrel pans.

DETAILS OF LUDOWICI SMALL TAPERED MISSION TILES AND FITTINGS



Section showing cover over concealed gutter. Pan is omitted.

IMPORTANT DATA

Small Tapered Pans and Covers

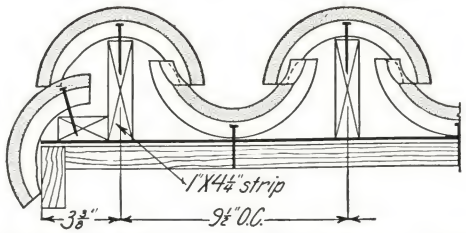
Length	14¼"
Width center to center of covers	9½"
Average length exposure	11¼"
Average pieces per square	270
Average weight per square	1330 lbs.

Small Tapered Covers and 14¼" Straight Barrel Pans

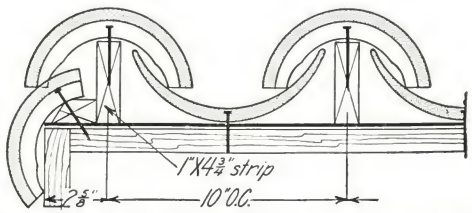
Length, pan	14¼"
Length, cover	14¼"
Width center to center of covers	10"
Average length exposure, pans	11¼"
Average length exposure, covers	11¼"
Average pieces per square, pans	128
Average pieces per square, covers	128
Average weight per square	1310 lbs.

SCALE 1½" = 1'-0"

Small Tapered pans and covers.



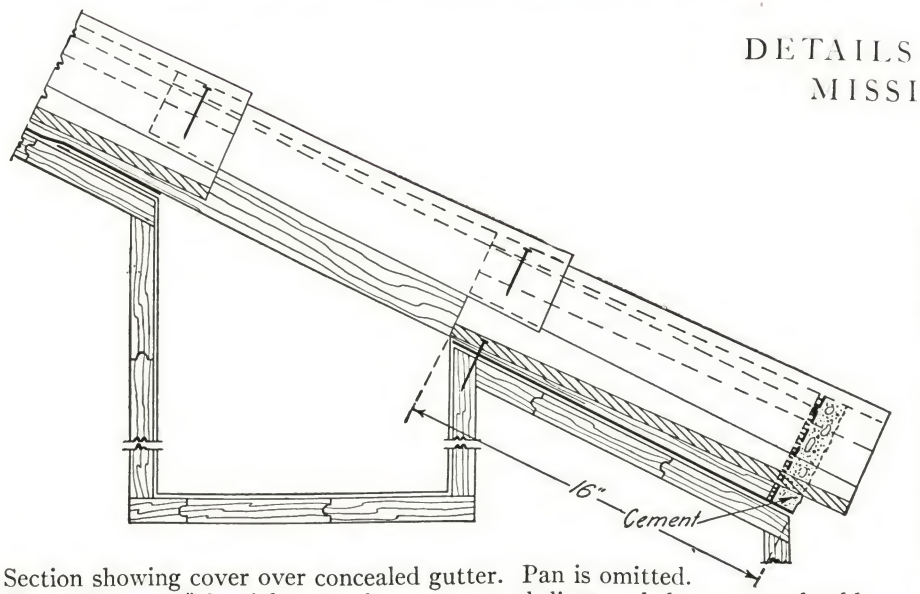
Section showing Small Tapered pans and covers, also split cover gable rake.



Section showing Small Tapered covers with 14¼" Straight Barrel pans, also split cover gable rake.

Small Tapered covers and Straight Barrel pans.

DETAILS OF LUDOWICI 18″ TAPERED MISSION TILES AND FITTINGS



Section showing cover over concealed gutter. Pan is omitted.
NOTE: When 18″ Straight Barrel pans are used distance below gutter should be 16″.

IMPORTANT DATA

18″ TAPERED PANS AND COVERS

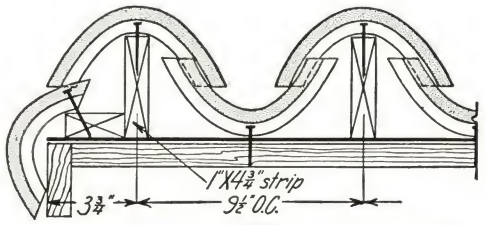
Length	18 ″
Width center to center of covers	9½″
Average length exposure	15 ″
Average pieces per square	204
Average weight per square	1410 lbs.

18″ TAPERED COVERS AND 18″ STRAIGHT BARREL PANS

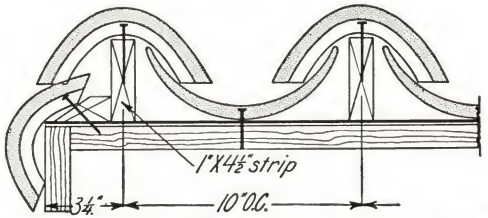
Length, pan	18 ″
Length, cover	18 ″
Width center to center of covers	10 ″
Average length exposure, pans	15 ″
Average length exposure, covers	15 ″
Average pieces per square, pans	96
Average pieces per square, covers	96
Average weight per square	1340 lbs.

SCALE 1½″ = 1′-0″

18″ Tapered pans and covers.



Section showing 18″ Tapered pans and covers, also split cover gable rake.



Section showing 18″ Tapered covers and 18″ Straight Barrel pans, also split cover gable rake.

18″ Tapered covers and Straight Barrel pans.

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Roofing Tiles*

CHICAGO, 104 South Michigan Avenue

NEW YORK, 565 Fifth Avenue — ATLANTA, 823 Forsyth Bld'g.

OKLAHOMA CITY, 614 Mercantile Bld'g. — WASHINGTON, 738 Fifteenth Street, N. W.

Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

SPANISH TILES

This pattern is available in a range of colors in a variety of surface textures

SPECIFICATIONS

Note: *Notes are explanatory or advisory only and should not be included in the specifications.*

Note: *Words in italics enclosed within parentheses are selective to suit particular condition. Include or omit as required.*

Note: *Clauses are selective. Include or omit as they apply.*

(1) Tiles

(1a) Cover roofs so indicated with Ludowici-Celadon Company's Spanish tiles and fittings of (*specify*) color.

(1b) (*Hips shall be cut*) (*and*) valleys shall be cut and closed before burning.

(2) Nails

All nails for flashings and tiles shall be copper.

(3) Felt

(3a) Lay asphalt felt weighing 30 lbs. per square, doubled on (*low pitches*) (*rough surfaces*) (*hips*) (*valleys*) (*and*) ridges. Lay parallel to eaves. Lap 2½″ horizontally and 6″ vertically. Fasten with large-headed galvanized nails.

(3b) Extend felt (6″ *up vertical walls*) (*and*) 4″ over (*gutter*) (*and*) (*valley*) metal.

(4) Wood Strips

(4a) Provide 1″ x 2″ strips under end bands and 1″ stringers of necessary height under (*hip rolls and*) ridges.

(4b) Embed parallel with the pitch on 20″ centers 1″ x 2″ beveled wood strips flush with surface of concrete. Fasten felt with lath nailed over these strips. At right angles to embedded strips, over lath, install 1″ x 2″ strips spaced to suit tiles.

Note: *Include* (4b) *if roof base is concrete.*

(5) Flashings

(5a) Line valleys with 16 oz. copper at least 20″ wide. Turn edge over ¼″. Lap joints at least 4″. Fasten with cleats. Do not solder.

(5b) At sides of vertical surfaces, extend base flashing at least 6″ up wall, 4″ under tiles and turn up edge 1½″.

(5c) At fronts, extend flashing at least 3″ up wall and 4″ over tiles.

(5d) Masonry wall shall be cap flashed and pointed.

(5e) Where tile and metal roofs intersect, extend metal up tile roof 12″ or more.

(5f) Extend gutter metal up roof to a point higher than outer edge of gutter.

(6) Laying

(6a) Lay tiles to straight lines, parallel and at right angles to eaves, lapped 3″. Fasten with 1½″ copper nails. Fasten tiles overlapping sheet metal with copper wire and elastic cement.

(6b) Leave opening of 6″ or more across valleys.

(6c) Cement gable rakes to field tiles and fasten with 2½″ copper nails.

(6d) Cement hip rolls in laps and fasten with 2″ copper nails.

(6e) Cement ridges in laps and fasten with 2½″ copper nails.

(6f) Where tiles join hip stringers make waterproof with elastic cement.

(6g) Cement small pieces of graduated tiles solidly with elastic cement.

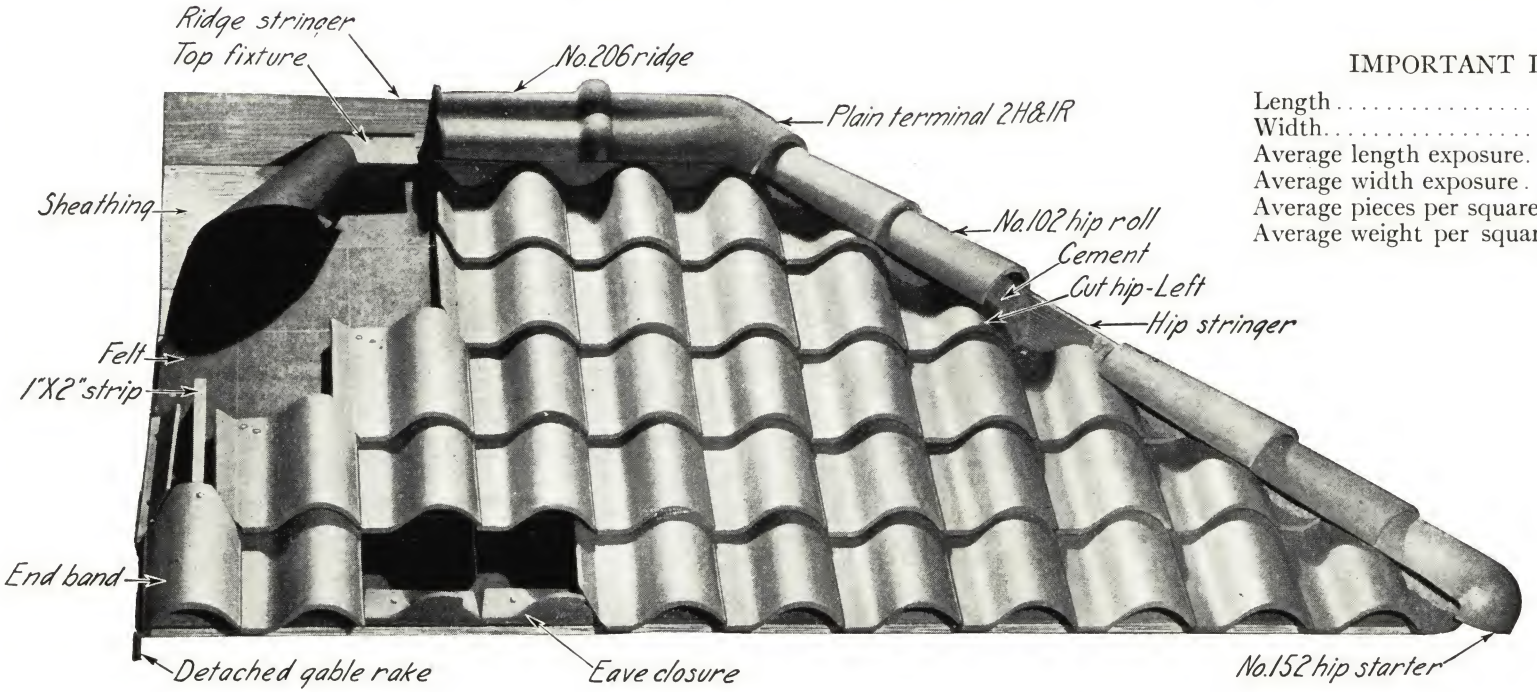
Note: *Include* (6g) *on circular roofs.*

(6h) Cement all tiles in laps, using 30 lbs. of elastic cement per square.

Note: *Include* (6h) *on high buildings.*

Details concerning any roofing problem furnished on request.
If additional copies of this catalogue are desired, please write.

DETAILS OF LUDOWICI SPANISH TILES



IMPORTANT DATA

Length	$13\frac{1}{4}$"
Width	$9\frac{3}{4}$"
Average length exposure	$10\frac{1}{4}$"
Average width exposure	$8\frac{1}{4}$"
Average pieces per square	171
Average weight per square	830 lbs.

CORRECT RAFTER LENGTHS FOR FULL LENGTH TILES

Based on 2" projection at eave of roof.

COURSE	RAFTER
1	$11\frac{1}{4}$"
2	$21\frac{1}{2}$"
3	$31\frac{3}{4}$"
4	42 "
5	$52\frac{1}{4}$"
6	$62\frac{1}{2}$"
7	$72\frac{3}{4}$"
8	83 "
9	$93\frac{1}{4}$"
10	$103\frac{1}{2}$"
11	$113\frac{3}{4}$"

HIP AND RIDGE STRINGER HEIGHTS

ROOF PITCH	HIP NO. 102	RIDGE NO. 206
4" Rise to 12" Run	5 "	$6\frac{1}{2}$"
5" Rise to 12" Run	$4\frac{7}{8}$"	$6\frac{1}{4}$"
6" Rise to 12" Run	$4\frac{7}{8}$"	6 "
7" Rise to 12" Run	$4\frac{3}{4}$"	$5\frac{3}{4}$"
8" Rise to 12" Run	$4\frac{3}{4}$"	$5\frac{1}{2}$"
9" Rise to 12" Run	$4\frac{5}{8}$"	$5\frac{3}{8}$"
10" Rise to 12" Run	$4\frac{5}{8}$"	$5\frac{1}{4}$"
11" Rise to 12" Run	$4\frac{5}{8}$"	$5\frac{1}{8}$"
12" Rise to 12" Run	$4\frac{1}{2}$"	5 "
13" Rise to 12" Run	$4\frac{1}{2}$"	$4\frac{7}{8}$"
14" Rise to 12" Run	$4\frac{1}{2}$"	$4\frac{3}{4}$"
15" Rise to 12" Run	$4\frac{3}{8}$"	$4\frac{1}{2}$"

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Roofing Tiles*

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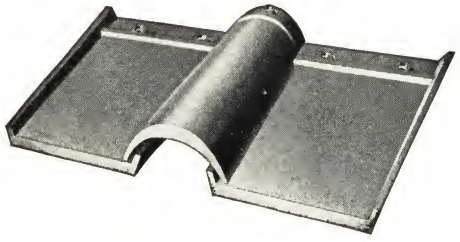
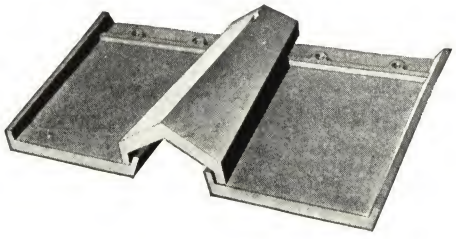
Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

ROMAN TILES



These patterns are available in a range of colors in a variety of surface textures.

GREEK TILES



SPECIFICATIONS

Note: *Notes are explanatory or advisory only and should not be included in the specifications.*
Note: *Words in italics enclosed within parentheses are selective to suit particular condition. Include or omit as required.*
Note: *Clauses are selective. Include or omit as they apply.*

(1) Tiles

(**1a**) Cover roofs so indicated with Ludowici-Celadon Company's (*Roman*) (*Greek*) tiles and fittings of (*specify*) color.

(**1b**) (*Hips shall be cut*) (*and*) valleys shall be cut and closed before burning.

(2) Nails

All nails for flashings and tiles shall be copper.

(3) Felt

(**3a**) Lay asphalt felt weighing 30 lbs. per square, doubled on (*low pitches*) (*rough surfaces*) (*hips*) (*valleys*) (*and*) ridges. Lay parallel to eaves. Lap $2\frac{1}{2}$″ horizontally and 6″ vertically. Fasten with large-headed galvanized nails.

(**3b**) Extend felt (6″ *up vertical walls*) (*and*) 4″ over (*gutter*) (*and*) (*valley*) metal.

(4) Wood Strips

(**4a**) Provide 1″ x $2\frac{5}{8}$″ strips under covers and 1″ stringers of necessary height under (*hip rolls and*) ridges.

(**4b**) Embed parallel with the pitch on 20″ centers 1″ x 2″ beveled wood strips flush with surface of concrete. Fasten felt with lath nailed over these strips. At right angles to embedded strips, over lath, install 1″ x 2″ strips spaced to suit pan tiles.

Note: *Include* (4b) *if roof base is concrete.*

(5) Flashings

(**5a**) Line valleys with 16 oz. copper at least 20″ wide. Turn edge over $\frac{1}{4}$″. Lap joints at least 4″. Fasten with cleats. Do not solder.

(**5b**) At sides of vertical surfaces, extend base flashing at least 6″ up wall, 4″ under tiles and turn up edge 2″.

(**5c**) At fronts, extend flashing at least 3″ up wall and 4″ over tiles.

(**5d**) Masonry wall shall be cap flashed and pointed.

(**5e**) Where tile and metal roofs intersect, extend metal up tile roof 12″ or more.

(**5f**) Extend gutter metal up roof to a point higher than outer edge of gutter.

(6) Laying

(**6a**) Lay tiles to straight lines, parallel and at right angles to eaves, lapped 3″. Fasten with $1\frac{1}{2}$″ copper nails. Fasten tiles overlapping sheet metal with copper wire and elastic cement.

(**6b**) Leave opening of 6″ or more across valleys.

(**6c**) Cement gable rakes to field tiles and fasten with $2\frac{1}{2}$″ copper nails.

(**6d**) Cement hip rolls in laps and fasten with 2″ copper nails.

(**6e**) Cement ridges in laps and fasten with $2\frac{1}{2}$″ copper nails.

(**6f**) Where tiles join hip stringers make waterproof with elastic cement.

(**6g**) Cement small pieces of graduated tiles solidly with elastic cement.

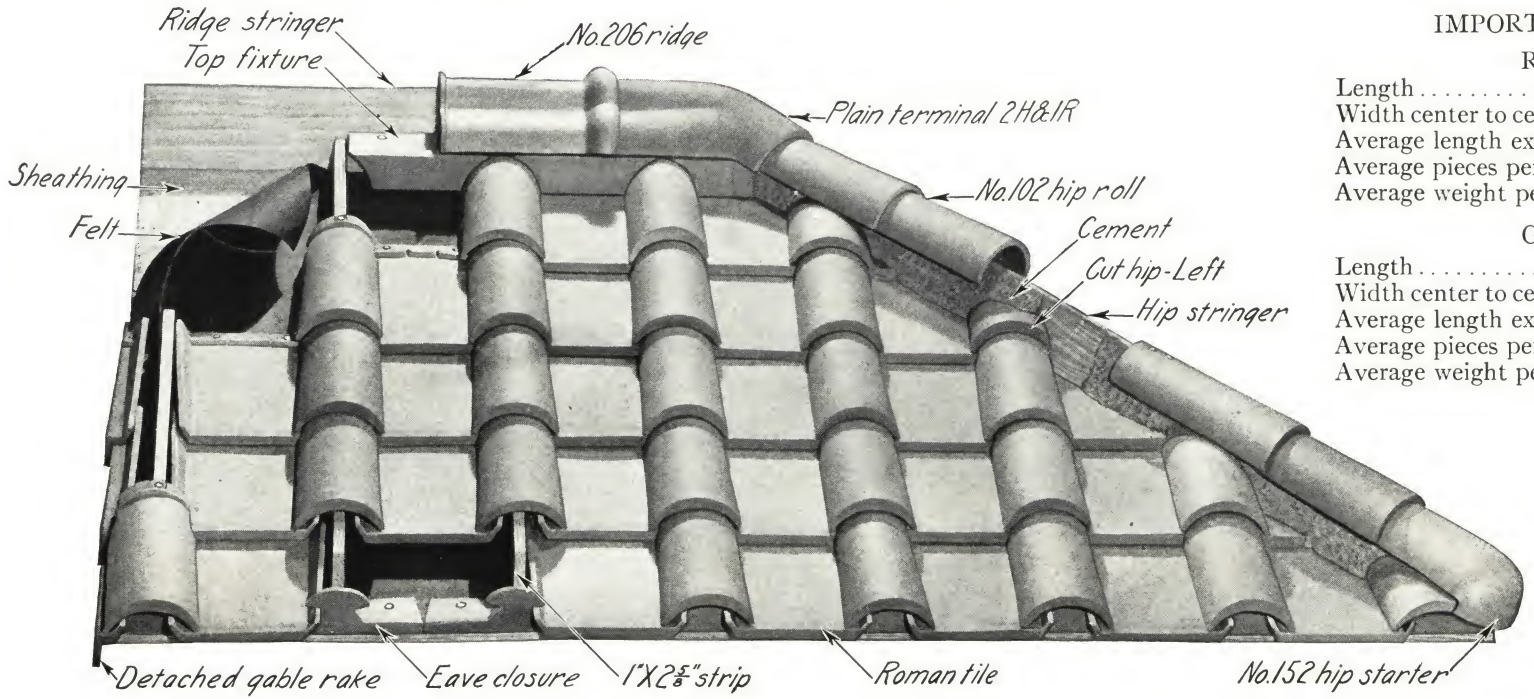
Note: *Include* (6g) *on circular roofs.*

(**6h**) Cement all tiles in laps, using 30 lbs. of elastic cement per square.

Note: *Include* (6h) *on high buildings.*

Details concerning any roofing problem furnished on request.
If additional copies of this catalogue are desired, please write.

DETAILS OF LUDOWICI ROMAN AND GREEK TILES



IMPORTANT DATA

Roman

Length	12¾″
Width center to center of covers.	12 ″
Average length exposure.	10 ″
Average pieces per square.	240
Average weight per square	1130 lbs.

Greek

Length	12¾″
Width center to center of covers.	12 ″
Average length exposure.	10 ″
Average pieces per square.	240
Average weight per square	1270 lbs.

CORRECT RAFTER LENGTHS FOR FULL LENGTH ROMAN OR GREEK TILES

Based on 2″ projection at eave of roof.

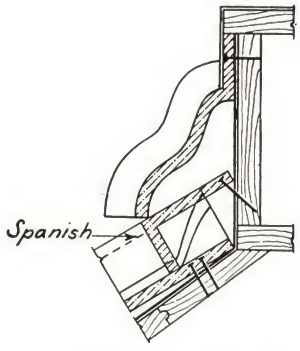
Course	Rafter
1	10¾″
2	20¾″
3	30¾″
4	40¾″
5	50¾″
6	60¾″
7	70¾″
8	80¾″
9	90¾″
10	100¾″
11	110¾″

HIP AND RIDGE STRINGER HEIGHTS

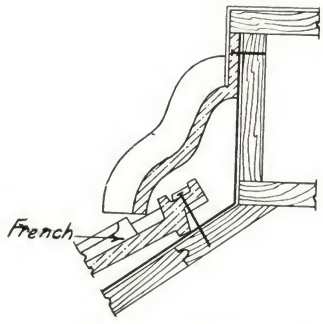
	Roman		Greek	
Roof Pitch	Hip No. 102	Ridge No. 206	Hip-Cover	Ridge No. 211
4″ Rise to 12″ Run	6⅜″	7¼″	7 ″	6 ″
5″ Rise to 12″ Run	6¼″	7 ″	7 ″	5¾″
6″ Rise to 12″ Run	6¼″	6¾″	7 ″	5½″
7″ Rise to 12″ Run	6¼″	6½″	6⅞″	5¼″
8″ Rise to 12″ Run	6⅛″	6¼″	6⅞″	5⅛″
9″ Rise to 12″ Run	6⅛″	6⅛″	6⅞″	5 ″
10″ Rise to 12″ Run	6⅛″	6 ″	6⅞″	4⅞″
11″ Rise to 12″ Run	6⅛″	5⅞″	6⅞″	4¾″
12″ Rise to 12″ Run	6 ″	5¾″	6¾″	4⅝″
13″ Rise to 12″ Run	6 ″	5⅝″	6¾″	4½″
14″ Rise to 12″ Run	6 ″	5½″	6¾″	4⅜″

DETAILS OF LUDOWICI TILES AND FITTINGS

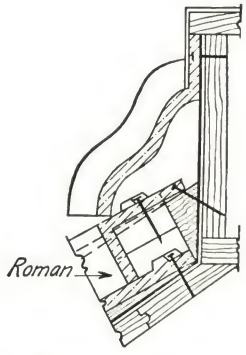
SCALE $1\frac{1}{2}'' = 1'\text{-}0''$



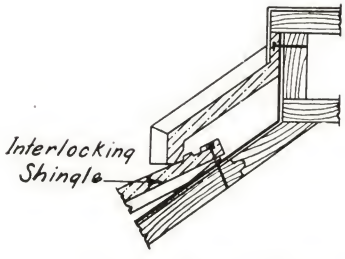
Deck section showing No. 206 deck mould-raised flange.



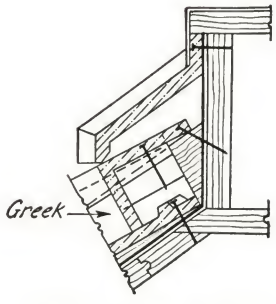
Deck section showing No. 206 deck mould-raised flange.



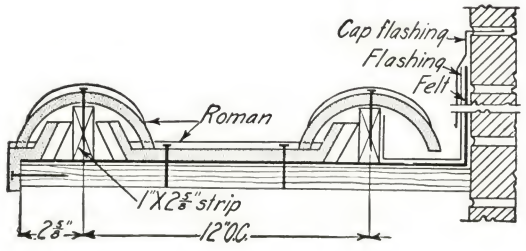
Deck section showing No. 206 deck mould-raised flange.



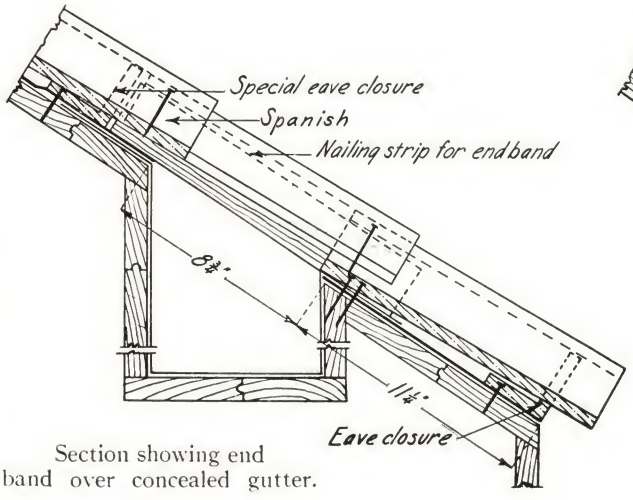
Deck section showing No. 211 deck mould-raised flange.



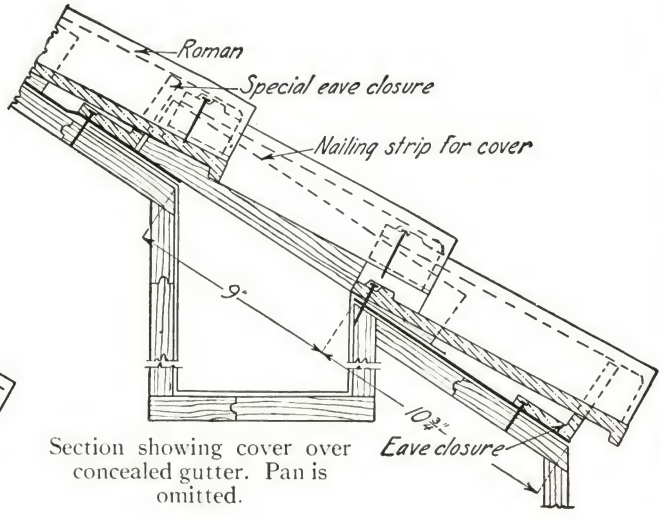
Deck section showing No. 211 deck mould-raised flange.



Section showing left gable rake, also flashing under side of tiles.



Section showing end band over concealed gutter.



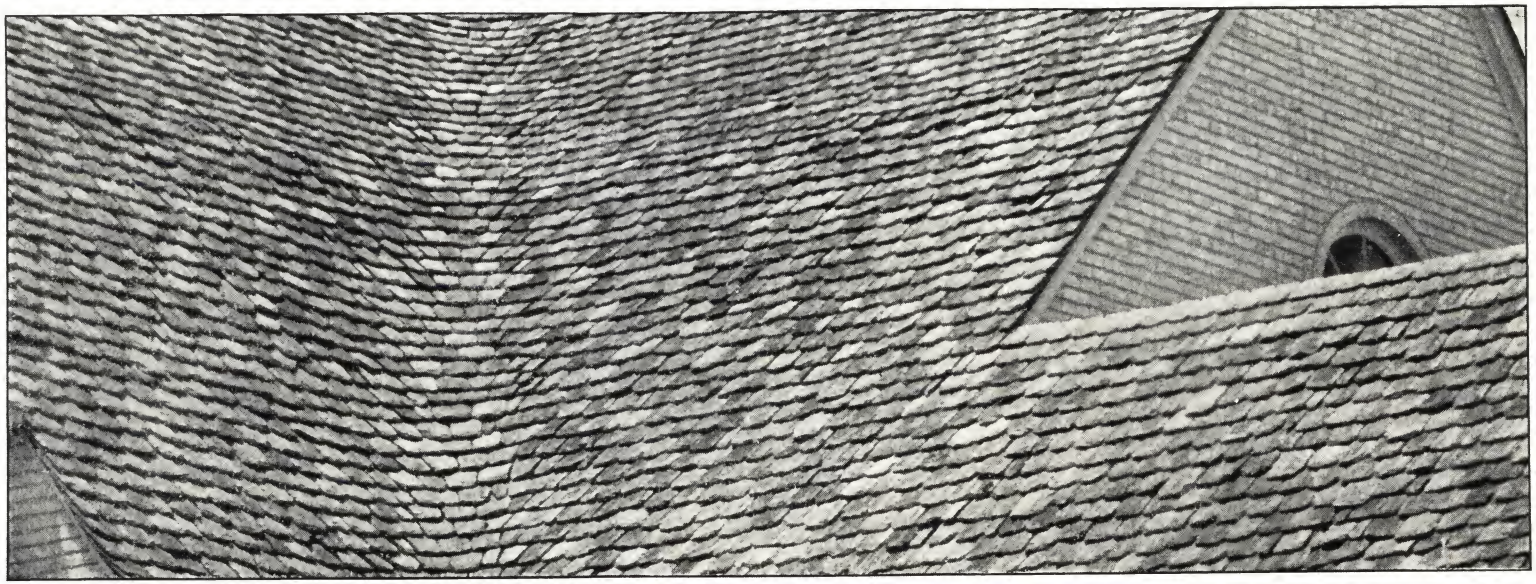
Section showing cover over concealed gutter. Pan is omitted.

LUDOWICI SHINGLE TILES

Brittany Shingle Tiles

Mission cover ridge

Sprocket hip roll



Yale Memorial Tiles

LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Tile Slabs*

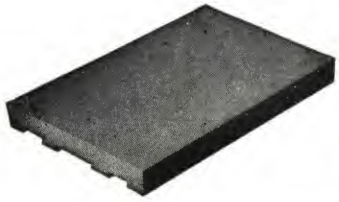
CHICAGO, 104 South Michigan Avenue

NEW YORK, 565 Fifth Avenue — ATLANTA, 823 Forsyth Bld'g.

OKLAHOMA CITY, 614 Mercantile Bld'g. — WASHINGTON, 738 Fifteenth Street, N. W.

Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

TILE SLABS



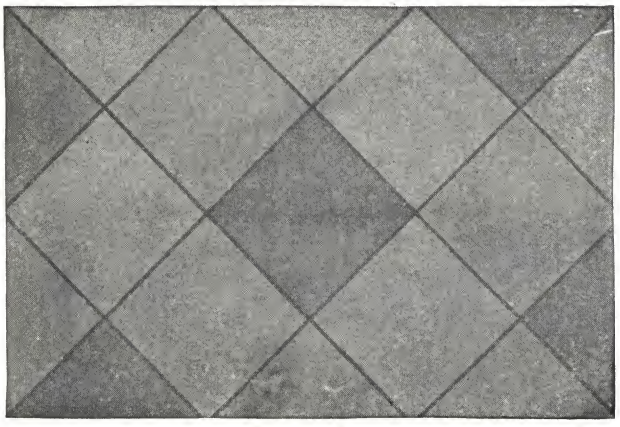
In addition to red colors, tile slabs are manufactured in a range of browns and fire-flashed shades.

A complete line of tile slab fittings is available.

NUMBER OF PIECES PER SQUARE

Mortar Joint	6″x6″x1″	6″x9″x1″	9″x9″x1″
1/8″	384	258	173
1/4″	369	250	168
3/8″	355	241	164
1/2″	341	234	160

6″x9″x1″



6″x6″x1″

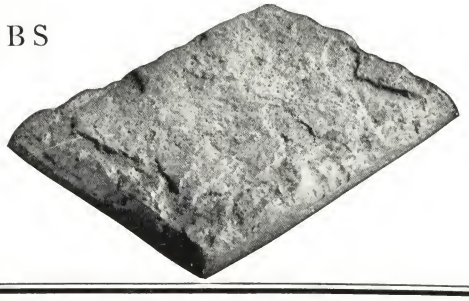
GARDEN WALK EDGING

Made in red, fire-flashed and black. Placed in the ground along walks or driveways it makes an interesting and practical edging for lawns or flower borders.

TILE FLAGGING SLABS

Made in a variety of colors. The texture suggests that of old stone flagging.

Size approximately 9″x12″x1¼″.



LUDOWICI-CELADON COMPANY

Makers of LUDOWICI *Floor Tiles*

CHICAGO, 104 South Michigan Avenue

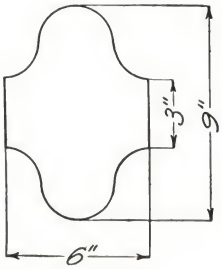
NEW YORK, 565 Fifth Avenue — ATLANTA, 823 Forsyth Bld'g.

OKLAHOMA CITY, 614 Mercantile Bld'g. — WASHINGTON, 738 Fifteenth Street, N. W.

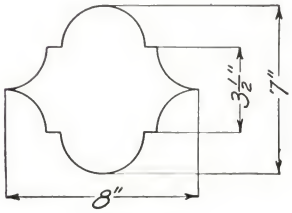
Factories located at NEW LEXINGTON, OHIO—COFFEYVILLE, KANSAS—PERU, KANSAS

FLOOR TILES

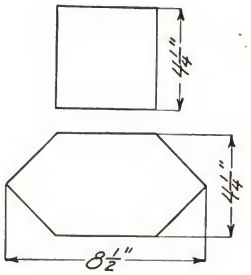
These shapes, in colors and textures originally manufactured for individual work of certain architects from their own designs, are now produced in quantities allowing their more general use. They are moderately priced.



Provence



Valencia



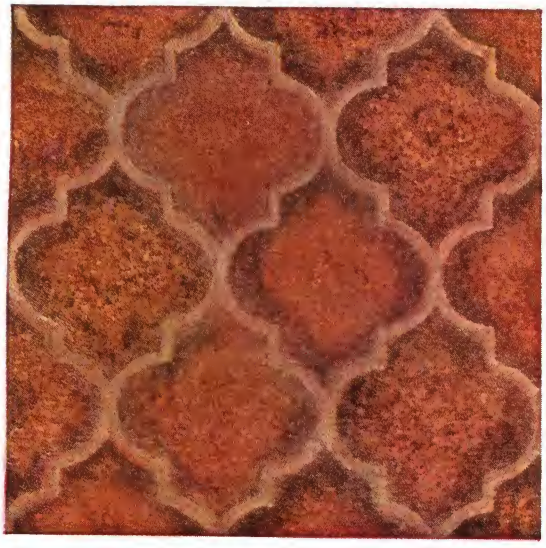
Renaissance

PIECES PER SQUARE FOOT

Based on ⅛" mortar joint.

Provence, 3.86
Valencia, 4.28
*Renaissance, squares, 1.88
*Renaissance, hexagons, 3.76

*Based on design showing square surrounded by hexagons.



LUDOWICI TILES

LUDOWICI-CELADON COMPANY

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NEW YORK – 565 Fifth Avenue
ATLANTA – 823 Forsyth Bld'g.
OKLAHOMA CITY – 614 Mercantile Bld'g.
WASHINGTON – 738 Fifteenth Street, N. W.

MURRAY TILE COMPANY

INCORPORATED

Manufacturers of Roofing, Quarry and Promenade Tile

CLOVERPORT, KENTUCKY

Products

Roofing Tile, Flat Shingle and Spanish Roll types.

For Quarry and Promenade Tile, see Manufacturers' Index.

Murray Roofing Tile

Description—Murray Roofing Tiles are made from extremely hard burning shales, are unglazed, impervious to moisture, and not affected by most extreme weather conditions. Roofs of Murray Tile, after more than twenty years of service, free from roof troubles and repair costs, are today apparently as good as the day applied. Beautiful, vivid colors and suitable textures provide opportunity for genuinely artistic effects.

Colors

Murray Red—Even shades of bright, vivid red, distinctive and attractive.

Murray Iridescent—Mixed fireflashed variegated blends in red, buff and brown color ranges; red range composed of light to dark shades of red, tan, gun metal and green, buff range of light to dark buff, russet and bluish purple, and brown range of an assortment of brown shades running into purplish black. The proportion of each color range used may vary as desired.

Textures

Smooth—True, even surface, with no scoring or hand-finished effect.

Rough Velvet—Machine scored to produce a soft, velvety appearance; scoring eliminates harsh, glaring effects. This texture most satisfactory where artistic effects are desired at low cost. When laid with staggered butt lines very similar to rougher, hand-finished tiles.

Old English—Hand roughened on surface, sides and ends to resemble weathered, quarried stone slabs. Produces deeper shadow lines account these irregularities and extra thickness. Random widths.

Typical English type Residence, Cincinnati, Ohio, showing application of Murray Rough Velvet Iridescent Flat Shingles, 70% Red Range, 20% Brown Range, 10% Buff Range, with no light Buffs or extremely dark Browns.

Roof Section, Murray Rough Velvet Iridescent Flat Shingles, mixed Red, Buff and Brown color ranges.

Roof Section, Murray Old English Iridescent Flat Shingles, mixed Red, Buff and Brown color ranges, Red predominating

Typical Spanish type Residence, Cincinnati, Ohio, showing application of Murray Rough Velvet Iridescent Spanish Roll, 60% Red Range, 20% Brown Range, 20% Buff Range, with no light Buffs or extremely dark Browns.

Trimmings and Special Tile—Hips, Hip Starters, Ridges, Ridge Ends, Finials, Gable Rakes, Closures, and all necessary trimmings made in various styles to fit different types of roofs, including cut tile for hips and valleys, made before burning.

Special tile for towers, dormers, etc., made from architect's drawings.

Sizes and Weights

	Texture	Length	Width	Average Exposure	Pieces per square	Weight per square
Flat Shingles	Smooth	14 in.	6¼ in.	5¾ in.	400	1200 lb.
Flat Shingles	Rough Velvet	14 in.	6¼ in.	5¾ in.	400	1200 lb.
Flat Shingles	Old English	12 in.	5¼, 6¼, 7¼, 8¼, 9¼ in.	5 in.	415	1600 lb.
Spanish Roll	Smooth	13¼ in.	10½ in.	8¼x10¼ in.	171	950 lb.
Spanish Roll	Rough Velvet	13¼ in.	10½ in.	8¼x10¼ in.	171	950 lb.

Service—To insure proper application and permanence, Murray Roofing Tile is sold only to responsible roof and sheet metal contractors. Catalogues, samples, and estimates will be furnished to architects and contractors on request.

Specifications—Cover roof areas indicated with Murray Flat Shingle (or Spanish Roll) tiles and trimmings, texture ....., color ....., with hips and valleys cut before burning.

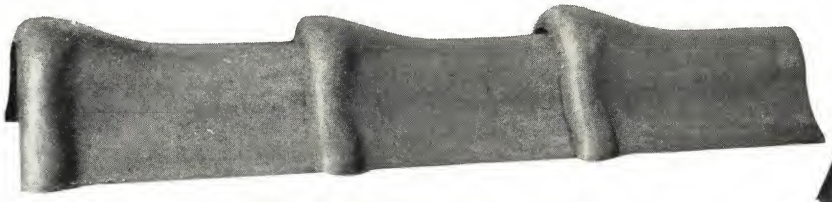
All nails for flashings and tiles shall be copper or double galvanized. Asphalt felt, not less than 30 lb. per square, shall be laid parallel to eaves, doubled on hips, valleys and ridges, lapped horizontally 2½″, and vertically 6″, and fastened with large-headed galvanized nails. Extend felt 6″ up vertical walls and 4″ over gutter and valley metal. Provide ¾″x1″ cant strips at eaves (if Spanish Roll 1″x2″ strips under end bands), and 1″ stringers of necessary height under hips and ridges. If roof base is concrete, 1″x2″ beveled wood strips shall be embedded parallel with the pitch on 20″ centers flush with surface of concrete for fastening felt with lath nailed above. At right angles to these strips, over lath, install 1″x2″ strips spaced for tiles. Line valleys with 16 oz. copper at least 20″ wide. Turn edge over ¼″, lap joints at least 4″ and fasten with cleats (if closed valleys flash between each course of tile with 16″ strips of same length as tile). At sides of vertical surfaces insert base flashing between each course of tile, lap 3″ and extend 4″ under tile and at least 6″ up wall (if Spanish Roll turn edge up 1½″). At fronts extend flashing 3″ up wall and 4″ over tile. Masonry wall shall be cap flashed and pointed. Where tile and metal roofs intersect extend metal up tile roof 12″ or more. Extend gutter metal up roof to a point higher than outer edge of gutter.

Lay tiles with regular (or irregular) butt lines, with average exposure of .....in., and not less than 2″ headlap on third course, doubling tiles at eaves, fastening with 1½″ or 1¾″ nails, except where tiles overlap sheet metal, then use copper wire and elastic cement (if Spanish Roll lay tiles to straight lines, parallel and at right angles to eaves, lapped 3″, and with 1½″ nails). Openings of 6″ or more should be left across valleys. Cement hip roll and ridges in laps, fastening with 2″ and 2½″ nails, respectively. Where tiles join hip stringers make waterproof with elastic cement. Cement small pieces graduated tile solidly with elastic cement (circular roofs).

Roof Section, Murray Smooth Red Spanish Roll

Roof Section, Murray Rough Velvet Iridescent Spanish Roll, mixed Red, Brown and Buff color ranges, Red predominating

ROOF TRIMMINGS USED WITH FLAT SHINGLES



Three No. 20 Ridge Roll Assembled
Height 6 in., length 13 in., lays 1 ft., each

No. 19 Closed End Ridge
Height 7 in., length 13½ in.

No. 9 Hip Starter

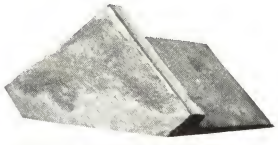
Three No. 8 Hip Roll Assembled
Height 4 in., length 13 in., lays 1 ft., each

Double Lip Ridge

No. 30 Three-way Terminal
Height 10½ in., length 16½ in.

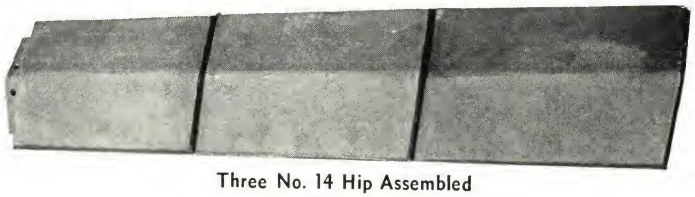
Three No. 25 Saddle Ridge Assembled
Lays 1 ft., each

No. 29 Three-way Terminal



No. 26 Closed End Ridge

No. 15 Hip Starter

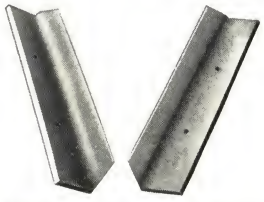


Three No. 14 Hip Assembled
Lays 1 ft. each

ROOF TRIMMINGS USED WITH SPANISH ROLL TILE

Note: Trimmings shown below were photographed from a different perspective than ones above, which accounts for the apparent proportional difference in size.

End Band or Half Tile



Right and Left Gable Rakes

Eave Closure

Top Fixture

No. 44 Hip Roll
Height 4 in., length 14 in., lays 1 ft.

No. 50 Ridge Roll
Height 6 in., length 13¾ in., lays 1 ft.

Hip Starters and Closed End Ridge to match Hip Roll and Ridge Roll are also furnished.

WILLIAM L. BARRELL CO. OF N. Y., INC.

Cotton Duck—Converted Fabrics

40 Worth Street, NEW YORK, N. Y.

BRANCHES

BOSTON, MASS., 52 Chauncy Street
CHICAGO, ILL., 323 South Franklin Street
KANSAS CITY, MO., 219 West 8th Street
LOS ANGELES, CALIF., 819 Santee Street
SAN FRANCISCO, CALIF., 235 Montgomery Street

CON-SER-TEX—A CANVAS COVERING FOR ROOFS AND FLOORS

Characteristics of Con-Ser-Tex

CON-SER-TEX CANVAS ROOFING
TRADE-MARK

Con-Ser-Tex is a specially woven cotton fabric scientifically treated by a chemical process which makes it not only waterproof but preserves it against the ravages of dry rot, mildew, vermin and the elements—the arch enemies of ordinary cotton duck.

The development of the chemical process had its origin in an investigation of the properties of Egyptian mummy cloths which have been known through the ages as possessing extraordinary features of durability. Modern research disclosed the fact that the cotton fibres had been physically altered to prevent capillary attraction and revealed the basic chemical treatment which was used in the process. In the manufacture of Con-Ser-Tex these same properties have been secured along with others which make the material particularly adaptable for its special uses. The chemical processes provide a protective coating to each cotton fibre which prevents the oils in paint from being absorbed by the fibres. In ordinary fabrics, these oils form one of the most destructive elements because of their oxidizing action. No oils or paraffin enter into the manufacture of Con-Ser-Tex.

While paint is necessary to provide a wearing surface on canvas decks, it is the inherent checking tendency of oil paints which not only breaks the surface fibres but exposes the body of the fabric to rotting and mildew. In Con-Ser-Tex these difficulties are reduced to a negligible minimum.

Adaptability and Advantages of Con-Ser-Tex

Con-Ser-Tex has many miscellaneous industrial uses, but in building construction as a roof covering and a floor covering in exposed locations subject to footwear it offers many advantages not obtainable by any other type of covering. Even where footwear is not a consideration it offers many advantages as a roofing material.

Under foot and heavy rain impact it is obviously less noisy than any metal covering.

There is no other type of roofing at once so light and so durable under foot traffic.

It offers advantages in its low heat transmission.

Con-Ser-Tex is an ideal covering for floors and roofs of porches for residences, hospitals, sanitariums, clubs, etc.

It is a most serviceable covering for roofs of frame or fireproof construction used for roof gardens and for recreational purposes in general.

In the heavy grades it is recommended for roofs where water is collected or retained, such as for spray ponds used in connection with air conditioning on refrigerating plants.

Corrosion will destroy tin and galvanized roofing materials sooner than Con-Ser-Tex will lose its strength and weather-resisting properties.

Practical Utility and Economy

Con-Ser-Tex is so woven and treated that there is no tendency to curl or blister. It lays flat. This is unusual in a material of its type.

As a covering for warped roof surfaces and geometrical forms, such as conical, domical and barrel roof surfaces, Con-Ser-Tex offers evident advantages. Its wide use by railroads for passenger car roofing bears testimony to this effect.

Facility in working makes Con-Ser-Tex useful for flashings, gutter and valley linings and at edges where more rigid materials would present difficulties.

Ease of installing results in time saving with consequent economy.

Preparation of Surfaces

Where the construction is of wood frame the surface may be of the common grades of pine, fir, spruce, etc., available in the locality and equal to No. 2 common flooring.

Where foot traffic is intended the surface and framing should be rigid. Material ⅞ in. thick and 3 ins. or not over 4 ins. wide will be found to give a satisfactory result and it must be tongued and grooved. It should be smooth, with joints planed if necessary. Any knots or pitch streaks must be shellacked. Shiplap should not be used.

Where there is likelihood of dampness from underneath, the wood should be painted on the underside before laying and the joints made up in white lead. White pine in narrow widths is particularly useful in such cases.

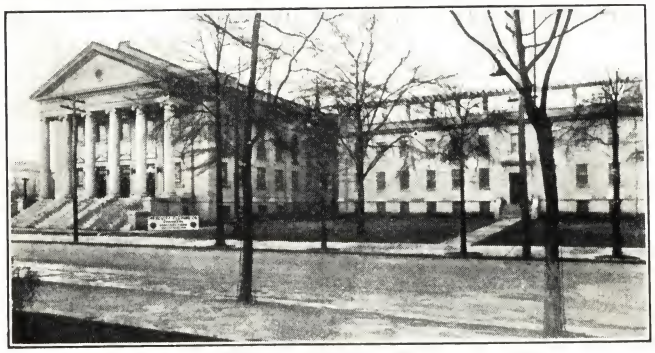
When used over masonry surfaces, portland cement topping should be laid and troweled to a smooth surface without projections which might perforate the Con-Ser-Tex, and dressed nailing strips dipped in creosote should be set as shown on accompanying detail.

How to Lay Con-Ser-Tex

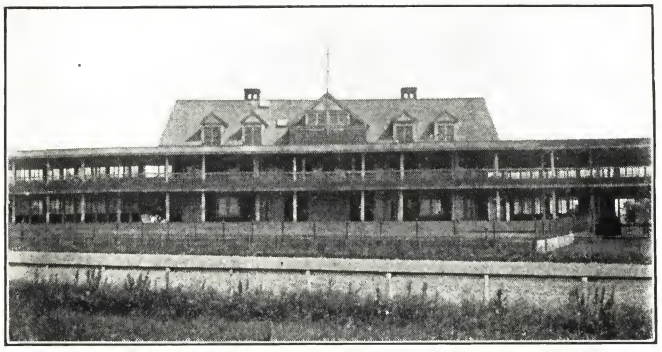
Dress the surface by eliminating rough places and sharp edges, after which apply a heavy coating of white lead thinned to a pasty consistency with linseed oil as a bedding (see Note). Over this bedding (while still wet) lay the Con-Ser-Tex, slightly stretching it so as to insure a close adhesion to the surface, taking care to arrange laps so as to permit free drainage.

If Con-Ser-Tex is to be laid in parallel courses with the building, the strips start from the outer or lower edge of the surface to be covered. Con-Ser-Tex should be turned up or flashed 4 to 6 ins. at walls to insure a watertight result.

While Con-Ser-Tex is stretched, fasten with ¾-in. copper or galvanized tacks 4 ins. apart on edge to be lapped. Coat the



Centenary M. E. Church, South, Chattanooga, Tenn.
Con-Ser-Tex is giving satisfactory service on floor of large roof garden



Club House, Empire City Race Track, Mt. Vernon, N. Y.
Con-Ser-Tex is giving service on the porch floor and roof

upper, exposed surface of the edge to be lapped 1½ ins. with the bedding paint, then apply the next strip, allowing a lap of not less than 1½ ins. Fasten with tacks ¾ in. apart.

After Con-Ser-Tex is laid and set, apply a light coat of good quality lead and oil paint, and a heavy second coat of best grade Deck paint after the first is thoroughly dry.

Note: If desired, we can furnish a special bedding paint which has greater adhesive qualities than ordinary white lead and oil.

Grades of Con-Ser-Tex

Grade E—A light weight grade, suitable for roofing small porches and for floors where traffic is light.

Grade G—A medium weight grade, suitable for larger porch floors and roofs on residences and public buildings.

Grade I—The heaviest grade, used principally for public buildings and all places where severe conditions exist.

Economy in Cost and Maintenance

The first cost of Con-Ser-Tex is reasonable and its upkeep practically nil, requiring painting only as often as the rest of the building.

LIST PRICES* OF CON-SER-TEX PER LINEAR YARD

Width, in.	Grade E	Grade G	Grade I
30	$1.17	$1.38	$1.47
36	1.39	1.60	1.78

Note: The above widths carried in stock. Other widths and special heavier weights processed to order. *Discounts furnished on request.

Advisory Service

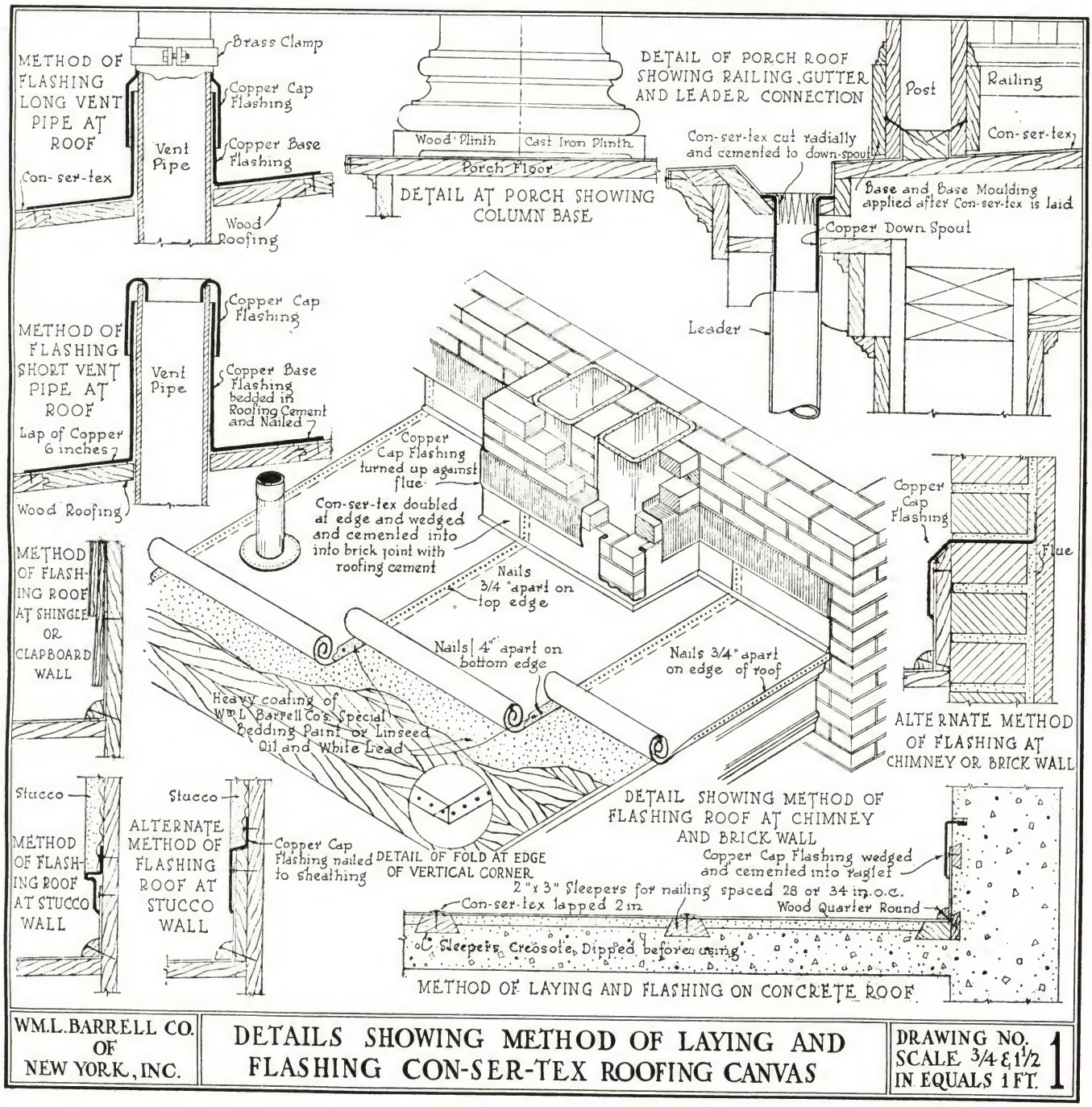
On receipt of dimensions of the surface to be covered, we will submit an estimate of cost, also a diagram showing the most economical method of laying Con-Ser-Tex, eliminating to the greatest possible extent all waste in cutting.

There is no charge for this service.

Guarantee of Material

Our company stands back of its products. We guarantee Con-Ser-Tex to be waterproof and to remain so for a period of ten years when laid and maintained in accordance with our instructions given on request with submission of drawings.

We do not, of course, guarantee Con-Ser-Tex against extraordinary conditions of traffic wear.



WM. L. BARRELL CO. OF NEW YORK, INC.	DETAILS SHOWING METHOD OF LAYING AND FLASHING CON-SER-TEX ROOFING CANVAS	DRAWING NO. 1 SCALE 3/4 & 1 1/2 IN EQUALS 1 FT.

H. H. ROBERTSON COMPANY

Robertson Protected Metal (RPM) for Roofing, Siding, Flashings

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CAN.; ELLESMERE PORT, CHESHIRE, ENG.

DISTRICT OFFICES

BALTIMORE, MD.	BUFFALO, N. Y.	CLEVELAND, OHIO	HOUSTON, TEX.	NEW YORK, N. Y.	PITTSBURGH, PA.
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		PORTLAND, ORE.		

ENGLAND, ELLESMERE PORT, CHESHIRE: Mersey Iron Works

CANADA: H. H. ROBERTSON CO., LTD., TORONTO, ONT., AND MONTREAL, QUE.

Products

ROBERTSON PROTECTED METAL (RPM) for Roofing, Siding; Flashings, General Building Trim, Ducts, etc. Also available in Skylights and Ventilators. (Robertson Protected Metal is protected by United States Patent No. 1,277,755. September 3, 1918; other United States and foreign patents issued and pending.)

TRADE-MARK

For Robertson V-Beam Protected Steel Roof Decks and V-Beam Roofing, for Robertson Glazing Construction, Skylights, Monitor, Sidewall and Special Sash, Double Glazing, and for Robertson Ventilators, see Manufacturers' Index.

Robertson Protected Metal (RPM)

Robertson Protected Metal (RPM) is a *protected* steel roofing and siding material which is made proof against rust and corrosion by a series of external factory-applied coatings. Protected by these permanent coatings, it is able to withstand the severe conditions found in and around industrial plants, including acids, alkalis, moisture, smoke, gases, fumes and condensation. In its freedom from corrosion and its elimination of maintenance, it is a most economical material to be used on industrial buildings, figured on a year-by-year cost.

The protective coatings are shown on the cutaway drawing below. They are: (1) asphalt; (2) asbestos felt, and (3) a heavy waterproofing envelope. RPM possesses a high degree of natural insulation because of the external protective layers which cover it. In addition, the outside envelope has a slightly "tacky" nature which makes the sheets seal themselves together where they lap. Roofs and walls of RPM therefore form a continuous sheet, instead of a collection of separate sheets. This eliminates infiltration of cold air from outside, prevents leakage of heat from within, cuts fuel bills and makes RPM buildings easier to heat.

Advantages—RPM eliminates the need for periodic painting and other maintenance expense. It is highly resistant to severe corrosive conditions. It is easily erected. Buildings covered with it can be readily enlarged, remodeled, or taken down altogether, moved and re-erected. RPM is fundamentally steel and has the strength of steel. When used as roofing it eliminates the necessity for a roof deck. It is light in weight and the supporting structural steel framework of the building can be correspondingly light. RPM is manufactured in various gauges and is adaptable to wide purlin spacings without danger of sagging. The number of purlins may be reduced to a minimum. Vibration will not cause it to break or loosen where it is bolted to the framework nor cause it to leak where the sheets are joined. It is flexible and can be bent or lapped to fit around corners or gables, to fit curved walls or roofs, or to fit warped or uneven surfaces that may occur because of variations in the supporting framework.

Cutaway Section of Robertson Protected Metal (RPM)
Showing the steel core sheet and the three layers of external coatings which make it rust-proof and corrosion proof and permanently take the place of paint

Gauges—All RPM sheets furnished in 24 to 18 gauges.

Completely Pre-fabricated—RPM is cut-to-fit before it leaves the factory. All special pieces are pre-fabricated to your exact requirements and thus there is little or no need for cutting and fitting on the job. Where necessary, RPM sheets are accompanied by erection diagrams showing exactly where each special sheet is to go.

20% Wider Than Commercial Corrugated Sheets—The Robertson Protected Metal Sheets are approximately 20% wider than commercial corrugated sheets. This reduces the number of side laps, and thus provides a greater effective area and an efficient building covering.

Standard Corrugated Roofing Sheets—In stock lengths of even feet from 5 to 12 ft. inclusive. Available also in odd lengths as specified. 33 in. wide, 12½ corrugations, each corrugation 2⅝ in. wide and ⅞ in. deep. Average covering width of 29¾ in., allowing 1½ corrugations side lap.

Standard Corrugated Siding Sheets—In stock lengths of even feet from 5 to 12 ft. inclusive. Available also in odd lengths, as specified. 33 in. wide, 13 corrugations. An average covering width of 31 in., allowing side lap of one corrugation.

Standard Mansard Sheets—In stock lengths of even feet from 5 to 12 ft. and intermediate lengths when desired. 33 in. wide, with six beads (each nominally 2½ in. wide). They have an average coverage of 30 in.

Fasteners—The standard method of fastening RPM is with metal straps around the purlins or girt, bolted to the RPM sheets. Even the straps used in fastening are protected against rust and corrosion, being completely encased in corrosion-proof coverings. These straps are of 18-gauge steel, ¾ in. wide. The bolts used in fastening are sherardized and have a special mushroom shaped head designed to make a tight and permanent joint.

In special cases for fastening siding sheets where the legs of the girts face up, there is a clip and bolt fastening. The clip slips over the leg of the girt and is bolted to the RPM sheets. The clip and bolt are sherardized.

For applying RPM on wood, there are special nails with mushroom heads.

Where Extra Strength is Required—Robertson V-beam corrugations give greater strength than the standard rounded form of corrugations. For complete information about them see Manufacturers' Index for separate section on Robertson Protected Steel Roof Decks and Robertson V-Beam Roofing.

CREO-DIPT MOHAWK SHINGLES

Fireproof—Made of Cement and Asbestos

CREO-DIPT COMPANY, INC.

NORTH TONAWANDA, N. Y.

FACTORIES, SALES OFFICES OR WAREHOUSES IN ALL PRINCIPAL CITIES

Other Creo-Dipt Products: Creo-Dipt Stained Shingles (Wood), Creo-Dipt Fireproof Shingles (Asbestos and Cement), Creo-Dipt Building Papers, Creo-Dipt White (Double Strength)

See Manufacturers' Index for Information on These Products

CREO-DIPT-MOHAWK SHINGLES

Fireproof—Made of Cement and Asbestos

Creo-Dipt-Mohawk Shingles

Creo-Dipt-Mohawk Shingles are the same shingles that, under the name of Mohawk Tapered Asbestos Shingles, have won favor with architects for more than twenty years because of their individuality in texture and color.

Creo-Dipt-Mohawk Shingles are fireproof (Underwriters' Class A Label) and are made of natural materials—portland cement and asbestos. They are tapered with thick butts. Because of the exclusive Creo-Dipt-Mohawk method of manufacture, they are the only asbestos shingles that can be said to have real individuality in texture and color. They are practically custom-made shingles, with all the beauty of color and shadow lines previously found only in wood, or heavier materials such as stone, tile, or slate. Yet because they are lighter than stone or slate, they are much easier to lay and do not require so heavy an understructure.

Our chemists estimate that Creo-Dipt-Mohawk Shingles will last at least a hundred years in any normal climate with no important changes in structure or texture.

Designs and Colors

Creo-Dipt-Mohawk Shingles are made in seven different designs and many colors—allowing wide opportunity for individual roof treatments. Illustrations of these designs are shown on the next two pages.

Specifications

Write us, or ask nearest Creo-Dipt representative, for complete specifications for all types of Creo-Dipt-Mohawk Shingles. Full size samples and photographs of Creo-Dipt-Mohawk houses will also be furnished upon request. Look for the name Creo-Dipt in your telephone book.

The Williamsburg (Fireproof—made of cement and asbestos) is a perfect fireproof reproduction of an old, hand-hewn wood shingle

This Home Belonged to Mary Washington, Mother of George Washington

The Williamsburg type of Creo-Dipt-Mohawk Shingles was used on this reproduction in Fredericksburg, Va.

CREO-DIPT MOHAWK SHINGLES—FIREPROOF—MADE OF CEMENT AND ASBESTOS

SQUARE AND ROUGH BUTTS

Illustration at right shows how the two simplest types of Creo-Dipt-Mohawk Shingles, Square Butts and Rough Butts, may be combined to give the effect of rugged texture and heavy shadow lines. Either type may be used separately throughout an entire roof. Tapered, with thick butts.

Colors

Black, Brown, Purple, Acme Red, Buff, Dark Gray, Light Gray. Soft shades can be intermixed at random without sharp contrast. Special colors furnished on request.

Size and Weight

Square and Rough Butts, 8 x 16 in., 260 shingles per square, laid 7 in. to weather. Thickness at butt ⅜ to ½ in. Weight, loose, per square, 720 lb.

Square and Rough Butts Intermixed

RUSTIC TYPE

Rustic Type

The Rustic Type of Creo-Dipt-Mohawk Shingles, shown at left, is another individual design. This design is textured differently from Creo-Dipt-Mohawk Rough Butts and should not be used in mixture with any other type. Tapered, with thick butts.

Colors

Same as Square and Rough Butts.

Size and Weight

Same as Square and Rough Butts.

Adaptability

Creo-Dipt-Mohawk Square Butts, Rough Butts, and Rustic Type may be used with Colonial, Georgian, English, French, modern English, early American architecture, etc.

MOHAWKSTONNE AND STONNETEXTURE

Mohawkstonne (right) is specially textured and colored in soft tints to duplicate the effect of Cotswold, Eyford and Yorkshire split-stone roofs. Thickness and color-tints are intermixed at random. Stonnetexture is produced in the same hand-moulded texture, but in deeper colors. Tapered, with thick butts.

Colors

Mohawkstonne is produced in a special mixture of Graystonne, Bluestonne, Brownstonne, Buffstonne, and Redstonne, blended throughout the roof. Stonnetexture: choice of Dark Gray, Purple, Buff, Brown, Black, Acme Red.

Size and Weight

Mohawkstonne: Sold only in mixture ⅜ in., ½ in., ⅝ in., ¾ in., ⅞ in., 1 in. Weight 900 lbs. per square.

Stonnetexture: 16 in. long, random widths of 6, 8, 10 and 16 in. Thickness at butt, ⅜ to 1 in. Weight, 760 to 1440 lb. per square.

Mohawkstonne

CREO-DIPT MOHAWK SHINGLES—FIREPROOF—MADE OF CEMENT AND ASBESTOS

WILLIAMSBURG TYPE

The Williamsburg Type of Creo-Dipt Mohawk Shingle (right) is a perfect fireproof reproduction of weathered Colonial hand-hewn shingles. It was designed at the request of Architects Perry, Shaw & Hepburn for John D. Rockefeller, Jr.'s restoration of Williamsburg, Virginia. It has also been used on Henry Ford's Edison Museum at Dearborn, Michigan, designed by Robert O. Derrick, Architect, of Detroit, and on many homes designed by leading architects.

Williamsburg Shingles are hand-textured to represent both vertical and cross-grained types. They are tapered, with thick butts.

Colors

Made in a special brown-black. Special colors on demand only.

Size and Weight

16 in. long, random widths 5, 6 and 8 in. Thickness at butt, 3/8 to 1/2 in. Special widths and thicknesses furnished on request. Weight, loose, approximately 720 lbs., per square.

Adaptability

See Plymouth Type below.

Williamsburg Type

Plymouth Type

PLYMOUTH TYPE

The Plymouth Type of Creo-Dipt Mohawk Shingle (left) is a less expensive development in the reproduction of weathered wood shingles. Plymouth Type Shingles are hand-textured and tapered, but are more uniform in texture than the Williamsburg Type. Furnished in vertical grain only. Yet each Plymouth Type Shingle is individually textured so that no two shingles are exactly alike.

Colors

Plymouth Type Shingles are made in special brown-gray color only.

Size and Weight

16 in. long, random widths of 6, 8 and 10 in. Thickness at butt, 3/8 in. only. Weight loose, 680 lb. per square.

Adaptability

Both Williamsburg and Plymouth Type Shingles are especially adapted to Colonial, Georgian, and modern American architecture.

CREO-DIPT FIREPROOF SHINGLES

Made of Asbestos and Portland Cement

CREO-DIPT COMPANY, INC.

NORTH TONAWANDA, N. Y.

FACTORIES, SALES OFFICES OR WAREHOUSES IN ALL PRINCIPAL CITIES

Other Creo-Dipt Products: Creo-Dipt Stained Shingles (Wood), Creo-Dipt Mohawk Shingles (Fireproof—made of Cement and Asbestos), Creo-Dipt Building Papers, Creo-Dipt White (Double Strength)
See Manufacturers' Index for Information on these Products

CREO-DIPT FIREPROOF SHINGLES

Nature of Product

Creo-Dipt Fireproof Shingles are made of a combination of asbestos and portland cement united under great hydraulic pressure.

Creo-Dipt Fireproof Shingles were especially developed to meet the demand for a fireproof roofing popular in price with the texture and grain of a wooden shingle. Made in a variety of colors, Creo-Dipt Fireproof Shingles are the result of a great deal of thought and research. They give a beautiful, architectural effect at extremely low price and will please the most discriminating user.

Creo-Dipt Fireproof Shingles are available in American Method and Dutch Lap types. We also furnish ridge and hip shingles, ridge roll, and eave starters. Creo-Dipt Fireproof Shingles and all their accessories are fully explained in the following paragraphs.

Uses

Creo-Dipt Fireproof Shingles, both the Dutch Lap and American Method can be used in all types of roof construction on residences, apartments, schools, clubs, et cetera. Their individual texture and grain make them applicable for any type of architecture. Creo-Dipt Fireproof Shingles are the proper material to use in reroofing old homes. They can be laid directly over the old roofing.

Dutch Lap Method

This is an entirely new design developed by Creo-Dipt. Creo-Dipt Dutch Lap Shingles are self-aligning, self-spacing. Using the new Creo-Dipt Clincher they can be laid with great rapidity and at minimum cost.

These shingles are 16¼ x 16¼ inches in size; packed 15 shingles per bundle and require 90 shingles and Clinchers and one pound 1¼-in. galvanized nails per square when laid with ¼ side lap. Creo-Dipt Dutch Lap Shingles can also be laid with 1/3 side lap. The latter requires 100 shingles per square.

Creo-Dipt Dutch Lap Fireproof Shingles are manufactured in three shades of green, three shades of red, tan, ebon black and plain gray.

Eave starters for Creo-Dipt Dutch Lap Asbestos Shingles weight 60 lb. per 100 lineal feet. They are packed 99 pieces to 100 lineal feet, 15 pieces to the bundle, plus 9 additional pieces.

American Method

Creo-Dipt American Method Fireproof Shingles, made to appear on the roof exactly like wooden shingles, can be applied at either an even or staggered exposure.

Creo-Dipt American Method, Fireproof Shingles are not tapered. They are of uniform thickness. They are 8½x17 in. in size, approximately ¼ in. thick. They are packed 225 shingles to the square in 15 bundles of 15 shingles each. They are to be laid at an exposure of 7½ in. to the weather and require 2¼ lbs. of 1¼ in. galvanized nails per square.

Creo-Dipt American Method, Fireproof Shingles, are available in three shades of green, three shades of red, tan, ebon black and plain gray.

Starter Shingles

Starter Shingles, for use as an undercourse with Creo-Dipt American Method Fireproof Shingles, are cut from the same stock as the shingles themselves. The starter is 9½ in. wide by 17 in. long, approximately ¼ in. thick. 72 pieces are required for laying 100 lineal feet. The starter shingles are packed 18 pieces per bundle.

Hip and Ridge Shingles

Hip and ridge shingles for use with Creo-Dipt American Method Fireproof Shingles are 4-19/32 to 5-11/32 in. wide by 16 in. long. 340 pieces are required for laying 100 lineal feet and they are packed 17 shingles per bundle.

CREO-DIPT FIREPROOF SHINGLES

Cement and Asbestos

CREO-DIPT FIREPROOF SHINGLES
American Method

This illustration below shows a close-up of the Creo-Dipt American Method Shingles.

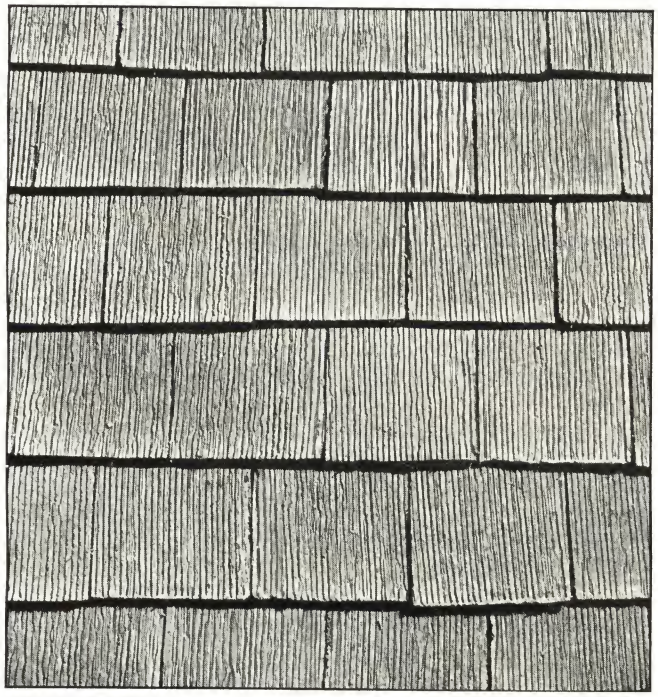
Notice the perfect grain and texture.

Creo-Dipt American Method Fireproof Shingles are a perfect reproduction of wooden shingles. There are four nailholes to every shingle so that they can be laid with a staggered effect as well as in straight courses.

Creo-Dipt American Method Fireproof Shingles carry an Underwriters' Class A label.

Stocks

Creo-Dipt Fireproof Shingles are carried by leading lumber dealers everywhere. The company has five shipping points conveniently serving in all parts of the country. They are at Manville, N. J., Waukegan, Ill., Cincinnati, Ohio, Gretna, La., and Pittsburg, Calif.



American Method

All inquiries regarding Creo-Dipt Fireproof Shingles to be addressed to the CREO-DIPT COMPANY, INC., North Tonawanda, N. Y.

Underwriters' Rating

Creo-Dipt American Method Fireproof Shingles carry an Underwriters' Class A label.

Creo-Dipt Dutch Lap Fireproof Shingles carry an Underwriters' Class B label.

CREO-DIPT FIREPROOF SHINGLES
Dutch Lap

The illustration below shows a close-up of Creo-Dipt Dutch Lap Fireproof Shingles.

These shingles were designed especially by Creo-Dipt. We furnish complete laying instructions for every job. Note the Creo-Dipt Clincher. Creo-Dipt Dutch Lap Fireproof Shingles are self-aligning and self-spacing, and this feature combined with the design of Creo-Dipt Dutch Lap Fireproof Shingles makes them the fastest shingle to lay ever produced.

They are a wonderful shingle for reroofing as well as for new work.

Dutch Lap

Creo-Dipt Representative

There is a Creo-Dipt Shingle for every purpose and the Creo-Dipt representative will be glad to work with you on any roof or sidewall problem. He will furnish samples, complete specifications, or any other literature you may require.

Look for Creo-Dipt in your telephone book or write the CREO-DIPT COMPANY, INC., North Tonawanda, N. Y

THE PHILIP CAREY COMPANY

Manufacturers of Shingles and Roofing Material

LOCKLAND, CINCINNATI, OHIO

BRANCHES AND DISTRIBUTERS IN PRINCIPAL CITIES

FACTORIES: LOCKLAND, OHIO, AND PLYMOUTH MEETING, PA.

Products

CAREYSTONE ASBESTOS - CEMENT SHINGLES.

CAREY ASFALTSLATE SHINGLES.

CAREY STRIP SHINGLES.

CAREYSTONE ASBESTOS - CEMENT SHEATHING.

Careystone WEATHER AGED ASBESTOS AND CEMENT SHINGLES

TRADE-MARK

CAREYSTONE ASBESTOS-CEMENT WALL BOARD.

CAREYSTONE CORRUGATED ASBESTOS-CEMENT ROOFING and SIDING.

For other Carey Products, see Manufacturers' Index.

CAREYSTONE ASBESTOS-CEMENT SHINGLES

Careystone Asbestos-Cement Shingles are made of two of the most durable materials known—asbestos and special portland cement.

They are verminproof, dampproof, dustproof, fireproof, and will not rot or rust.

Advantages

Careystone Asbestos-Cement Shingles can be laid over old wooden shingles as easily as on new roof construction. They will outlive the building itself, for they actually grow stronger with age. They are light enough to need no special supporting construction. The variety of shapes, sizes and colors give the architect an unlimited field for designing a roof to meet individual tastes.

Rating

When laid over saturated asbestos felt, i. e., Carey's Fiberock Felt, French and Scotch Method Careystone Asbestos-Cement Shingles take a class "B" rating of the Underwriters' Laboratories, Inc. The American Method Shingles take a class "A" rating.

Colors

Careystone Asbestos-Cement Shingles, in all styles and sizes, are made in five standard permanent colors: Windsor gray, Georgian red, Weathered brown, Tudor black and Bristol green.

Texture

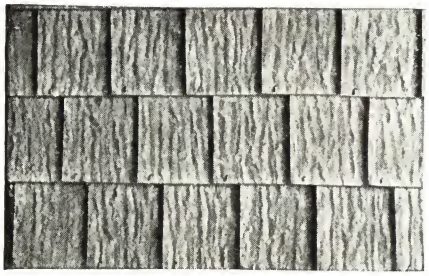
Patterns of rarest beauty, as infinite in variety as the water-tracings of nature in age-old stone. There cannot be found two shingles of identical pattern in a million squares. It eliminates the set, geometrical appearance so objectionable in the ordinary molded or stamped and composition shingle. Laid up in the roof they have all of the soft, changeable beauty and charm so noticeable in rived cypress after time and weather have worn its myriad veinings into bold relief.

French Style (Smooth Surface Only)

The hexagonal pattern shingle is desired by many builders for its low cost. It gives a very pleasing effect on some types of architecture. Each shingle is protected against windstorms by a copper storm nail in the center of the exposed corner. Size 16 in. x 16 in., $\frac{3}{16}$ in. thick. Furnished in the five standard colors.

French Style

Scotch Style (Weather-aged)



Scotch Style

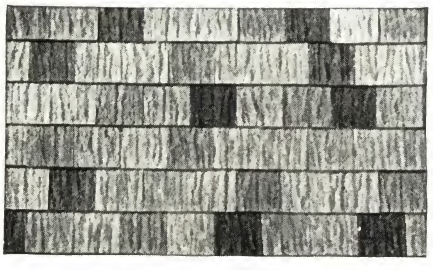
The Scotch style is a horizontal lap shingle which greatly resembles the straight lined American type. They have rough, rugged, untrimmed edges and will be attractive on most types of architecture, giving the much desired heavy vertical shadow line. Scotch style shingles cost very little more than the hexagonal type shingles, but most builders and architects will prefer it for its symmetrical shape and more pleasing design. The shingles are 16¼ in. x 16¼ in., $\frac{3}{16}$ in. thick, and are furnished in the five standard colors.

American Style (Weather-aged)

Where beauty, permanence and roof value are of first consideration, American style shingles are, of course, always first choice. They cost more, it is true, but they produce a wonderfully strong, double-thick roof of rectagonal design that is so pleasing on any type home.

American style Careystone shingles make the ideal roof for the fine home. They may be laid with edges close together, or with a ⅛ in. or ¼ in. joint between each shingle. Each shingle is double punched to permit laying with staggered butts, an effect that is in good taste and great demand for period architecture.

American type shingles are 8 in. x 16 in. and are made in two standard thicknesses, $\frac{3}{16}$ in. and ¼ in. There are five beautiful colors.

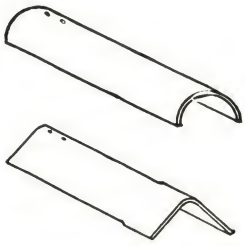


American Style

	American method	Scotch method	French method
Size, in.	8x16	16¼ x16¼	16x16
Thickness, in.	$\frac{3}{16}$ and ¼	$\frac{3}{16}$	$\frac{3}{16}$
Weather exposure, in.	7x8	12x13¼	13½x13½
Approx. wgt. per sq. lbs.	450	325	240
Underwriters' label	A	B	B
Colors	5 standard	5 standard	5 standard
Number shingles per square	260	90	80

Condensed Specifications

Roof to be Careystone Asbestos-Cement Shingles (1) Hexagonal Style, size 16 in. x 16 in. and 1/8 in. thick—(2) Scotch Method, size 16¼ in. x 16¼ in. and 3/16 in. thick—(3) American Method, size 8 in. x 16 in. and (5/16 in. or 1/8 in.) thick—color (Name color), to be laid over solid sheathing (if new building) with a layer of Carey saturated asbestos felt weighing not less than 15 lbs. per 100 sq. ft. between the sheathing and the shingles in strict accordance with the manufacturers' printed specifications and application instructions.



Careystone Asbestos-Cement Ridge Roll

Made in the same manner as Careystone Asbestos-Cement Shingles in colors that blend perfectly with the shingles. Furnished in two designs, the curved and angle shapes as illustrated.

CAREY ASPHALT SHINGLES

There is a Carey Rag Felt Asphalt Saturated Shingle to fit all types of building. Eight different shapes and many beautiful colors offer a limitless field in which the architect can design the roof best suited to the building.

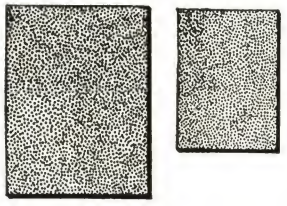
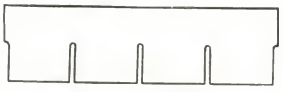
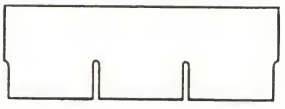
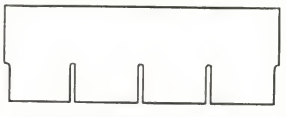
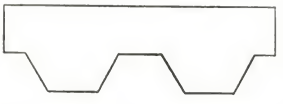
Only the highest quantity raw materials are used in manufacturing Carey Shingles.

Underwriters' Label—Carey Shingles are tested and accepted as standard by the Underwriters' Laboratories.

All Carey Asphalt Shingles bear the Underwriters' Class "C" label.

Chart

Use the following chart to select the type and color of shingles desired:

Shingles	Style	Approx. wgt. per sq. lbs.	Head lap, in.	Exposure, in.	Shingles per square
12x15 ¾-in. Asfaltslate Indian Red, Red-Green Blend Tile Red, Double-Brown Blend Empire Green, Blue Black Emerald Green, Colorblend Spanish Red, Golden Brown Green-Blue Blend, Chocolate Brown Tapestry		300	5¾	5	224
9x12 ¾-in. Asfaltslate Indian Red, Blue Black Empire Green, Colorblend		240	4¾	4	372
10x36-in. 4-tab Strip Indian Red, Tapestry Tile Red, Blue Black Empire Green, Colorblend Emerald Green, Red Shadow Blend Green Shadow Blend		190	2	4	100
12x36-in. 3-tab Strip Indian Red, Colorblend Tile Red, Tapestry Empire Green, Blue-Green Blend Emerald Green, Red-Green Blend Spanish Red, Double Brown Blend Blue Black, Red Shadow Blend Green Shadow Blend		240	2	5	81
12 ½x36-in. 4-tab Strip Indian Red Empire Green Blue Black Tapestry		240	4½	4	102
11 ⅓x36-in. Hexagonal Strip Indian Red, Blue Black Tile Red, Colorblend Empire Green, Tapestry Emerald Green		160	2	4⅔	86
12x40-in. Double Thick Hexagonal Strip Indian Red, Blue Black Tile Red, Colorblend Empire Green, Tapestry Emerald Green		210	4	4	90
12 ⅓x36-in. Extra Heavy Hexagonal Strip Indian Red, Emerald Green Tile Red, Blue Black Empire Green, Colorblend Tapestry		225	3	4⅔	87

JOHNS-MANVILLE

EXECUTIVE OFFICES
292 Madison Avenue, NEW YORK, N. Y.

For Branch Offices, see Section on Wall Tile

Products

JOHNS-MANVILLE RIGID ASBESTOS SHINGLES.
JOHNS-MANVILLE ASPHALT SHINGLES.
Also Packings for all purposes; Refractory Cements; Waterproofing and Dampproofing; Asbestos Ebony; Asbestos and Asphalt Roll Roofing; Rotproof Roofs; Asbestos Products of all kinds.

For the following Johns-Manville products, see Manufacturers' Index: Acoustical Treatment and Sound Isolation; Built-up Roofing; Home Insulation; Insulating Board and Insulating Lath; Insulations; Tile Flooring; Transite, Flat and Corrugated; Wall Tile.

JOHNS-MANVILLE RIGID ASBESTOS SHINGLES

J-M Rigid Asbestos Shingles are made of a combination of asbestos fibre and Portland cement united under great hydraulic pressure. They are fireproof and their durability is unaffected by climatic exposure.

They are manufactured in various sizes for application in four styles broadly known as the American, Dutch Lap, Diamond Thatch, and Hexagonal Methods of laying shingles. Included are shingles of uniform or tapered thickness, smooth or rough texture, applicable in one uniform color or in two or more colors blended. The application of the American Method Shingles, like other roofing materials of shingle form, may be varied to obtain effects ranging from those in which the lines of the butts appear straight and entirely regular, to those in which the units appear to have been placed entirely at random, with no definite scheme of regularity having been followed. Eaves starters, eaves shingles, ridge and hip shingles, and ridge roll are provided as required by the various styles and varieties.

A chart containing colors, dimensions, weights and other data on each style is shown on page 5.

Color

These shingles are produced in a wide range of colorings which have been the subject of exhaustive experiment, test, and study, to realize the qualities of color which will appeal and be in harmonious relation with other materials used in construction, and with natural surroundings. Colors have been greatly improved by recent experiment, the shingles now offered being exceedingly mellow and rich.

Re-roofing

For many years, Johns-Manville has advocated, in connection with re-roofing projects, the application of rigid asbestos shingles directly over existing wood shingles. This practice has been followed so successfully that we do not hesitate to recommend it to the architect.

There are instances, of course, where this procedure is inadvisable but in the great majority of cases the condition of the old wood shingles is such as will provide a proper foundation for the new shingles. The many advantages enjoyed where the removal of the existing wood shingles is unnecessary will be readily appreciated, and by simple preparatory alterations in the existing work the resulting job will not bear any evidence of the presence of the old roof covering.

Limitations of Roof Pitch

It is recommended that surfaces which are to receive asbestos shingles be pitched not less than 4 in. to the foot where the American Method Shingles are to be used and not less than 5 in. to the foot for the Diamond Thatch, Hexagonal or Dutch Lap Methods.

Underwriters' Rating

The American Method Shingles carry Underwriters' Class "A" label for all varieties. Dutch Lap, Diamond Thatch and Hexagonal Method Shingles carry Underwriters' Class "B" label.

Salem Roofs

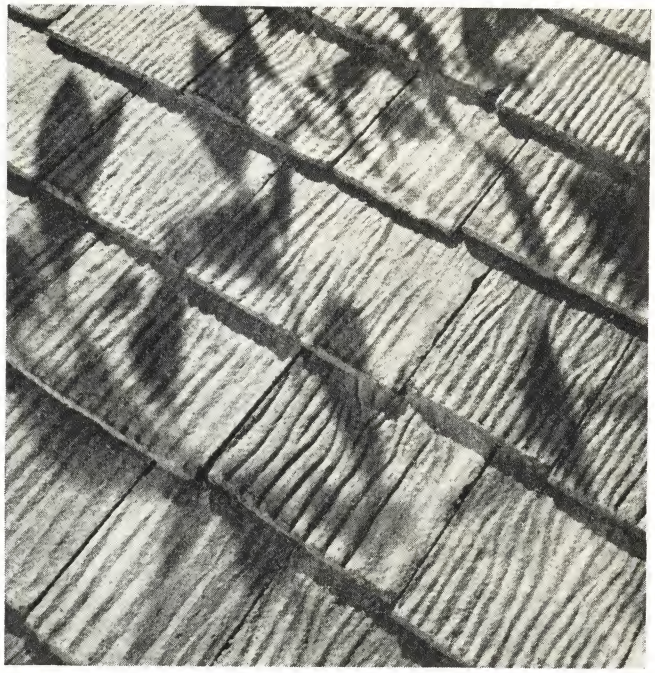
One cannot help but be impressed by the arresting charm of the earlier New England farm houses and their accompanying groups of out-buildings. The mass and detail of most of these houses are exquisite, but their appeal lies mainly in the old materials which have so gracefully aged and softened with years of exposure. The roofs, almost invariably of hand hewn wood shingles that years of exposure have warped and worn, have a beauty of color and texture impossible to adequately describe.

For this reason we have, under the guidance of Mr. Walter McQuade, Consulting Architect, developed the Salem Shingle, which, when applied, is a literal counterpart in appearance of the aged hand hewn wood shingle roofs of early New England, having, in addition, the advantage of being fireproof and superior in all points of durability. These shingles are available not only in warm weathered gray and black, but also in varying shades of soft greens, browns and reds, which may be used singly or in combination. To enhance the interesting irregularity of surface, so important, the shingles are of varying thicknesses being combined haphazardly on the roof.

In application they may be used over solid wood sheathing in new construction or over existing wood shingles, this latter feature of adaptability being valuable in restoration projects where it is desirable to retain the aged irregularity of the roof surfaces. They can also be used effectively for side wall finish, and in this application can be whitewashed as readily as their earlier prototype which was frequently treated in this way.

The designer, working with present day materials both in new construction and restoration work, encounters his greatest difficulty in the roof. He finds it almost impossible to obtain the old qualities of color and texture by the use of new material, even of a type similar to the original. It is here that the Salem Shingle finds its complete justification.

The wide range of colors in which Salem Shingles are available indicates that their use is not by any means limited to buildings of Colonial design. As the darker, more subdued colors provide effects in keeping with the Colonial, so do the brighter shades, the reds and browns, meet the requirement of the Spanish and other types with which bright roof colors are traditionally associated.



All the Charm and Beauty of Early American Colonial Roofs Have Been Recaptured and Made Permanent and Fireproof in Salem Shingles

Hancock-Clarke House, Lexington, Mass., Re-roofed with Salem Shingles

Historic memorials in America vary in the interest of their architectural design. While the Hancock-Clarke House in Lexington, Mass., cannot claim first rank as an example of Colonial architecture, its importance among the memorials which relate to the birth of the nation is second to none.

To this house, shortly after midnight had ushered in the eventful morning of April 19th, 1775, came Paul Revere to warn John Hancock and Samuel Adams of the march of the British troops to Concord and Lexington. It was here that he terminated the famous ride which held in its outcome the fate of a nation.

Originally consisting of the one-story gambrel-roofed ell, built in 1698 by the Reverend John Hancock, it was enlarged in 1734 by Thomas Hancock. Today it is a treasure house of antiquities of almost priceless value whose preservation against loss by fire or elemental damage is of consequence to every patriotic American. Roofed originally with the old hand-hewn wood shingles of early New England, their necessary replacement presented a problem to those who desired to see retained the exact characteristics of its early construction and material.

After careful consideration, Johns-Manville Salem Shingles were selected as an altogether happy solution as they not only offered an entirely weatherproof and fireproof roof but the effect of the old weathered hand-hewn shingles with which the roof was originally covered. With little claim to architectural distinction other than the charm of the original one-story ell, the re-roofing problem left no latitude for departures from the original effect without materially marring the appeal of the building in this respect.

In this characteristic of Johns-Manville Salem Shingles lies opportunity to preserve permanently one of the chief features of interest in many of our historic buildings of the Colonial era. Many of these must rest their claim largely upon the effect left by the softening hand of time upon the perishable materials used. Among these the Hancock-Clarke House is an interesting example.

Hancock-Clarke House as Re-roofed with Salem Shingles, Color No. 2 Weathered Black

American, Dutch Lap, Diamond Thatch and Hexagonal Methods

In addition to the Salem Shingles described in the foregoing pages, other styles have been developed to provide at a cost within the budget limitations of even the most modest house, a fire and weather resisting roofing material which will satisfy the two important

Roofed with the No. 30 Dutch Lap Method Shingles

æsthetic considerations—color and texture. In the selection of colors and the development of texture, our consulting architect, Mr. Walter McQuade, has been influenced by the thought that only through a proper combination of colors or colors and texture can the roof be made to partake of the spirit and character of the house and of its surroundings.

The Number Thirty-five Shingle (shown on page 4) has an actual rough surface texture. The Number Twenty-five Shingle provides the feeling of a rough texture although actually the surface is relatively smooth. Both types are tapered, with a thickness at the butt of approximately ¼ in. The edges are rough, in keeping with the irregularity of the texture, which features together with the colors maintains a feeling of natural softness not usually associated with a fabricated material.

Identical as to cost of material only, the Number Twenty-five Shingle in the standard widths, due to the fewer pieces involved, requires less labor in its application than the Number Thirty-five.

The Number Thirty Shingle, with the economy of the Dutch Lap Method, provides the familiar horizontal butt line characteristic at about the cost of asphalt shingles and other low priced roof covering materials of less permanence.

Made particularly for siding purposes the Number Forty-five Shingle, silver gray—almost white—in color, provides, in a fire and weather resisting material, the effect so desirable on Colonial and other architectural types. Its textural characteristics are similar to the Number Thirty-five Shingle.

The Diamond Thatch Shingle, Number Ninety, requiring but sixty-eight pieces per square, requires the minimum of labor expense in application. With its

No. 30 Dutch Lap Method Shingles; Hips Finished Boston Method

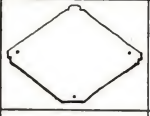
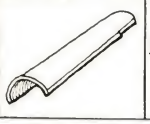
extreme economy it provides full weather protection in a fireproof, permanent material.

The Number Seventy Shingle, applicable by the familiar Hexagonal Method, provides a saving in labor through the relatively few number of pieces per square involved, as in the Dutch Lap and Diamond Thatch Methods. All of these three styles make procurable at the cost of asphalt shingles or other low-priced, less permanent materials, a fire and weatherproof roof in colors which are in keeping with the character of the building and its surroundings.

NUMBER THIRTY FIVE ASBESTOS SHINGLES
GRANADA RED · TOURAINE RED AND EBON BLACK

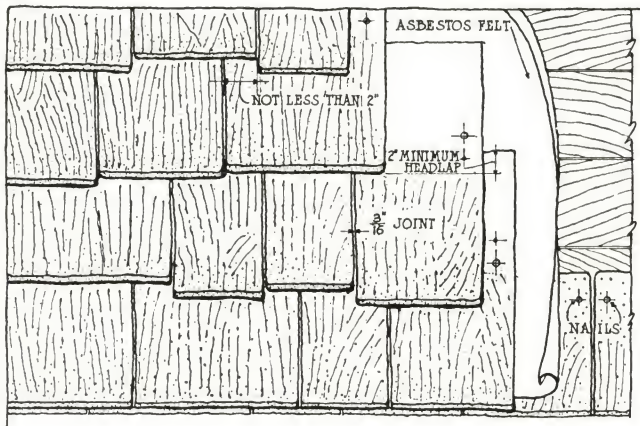
NUMBER THIRTY FIVE ASBESTOS SHINGLES
OLIVE GREEN AND SEA GREEN

TABULATION OF VARIOUS TYPES OF JOHNS-MANVILLE ASBESTOS SHINGLES

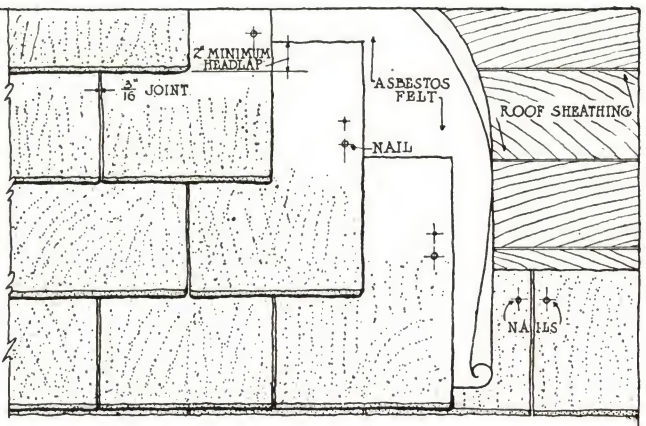
METHOD OF APPLICATION AND SHAPE	CATALOG NO OF SHINGLE	SIZE	THICKNESS	COLOR	APPROX. WEIGHT PER SQUARE APPLIED	WEATHER EXPOSURE	NO OF SHINGLES REQUIRED PER SQUARE	GALVANIZED SHINGLE NAILS REQUIRED PER SQ	COPPER STORM ANCHORS REQD PER SQUARE	CATALOG NO OF EAVES STARTER OR EAVES STARTER AND EAVES SHINGLE TO BE USED	NO OF STARTERS REQUIRED PER 100 LIN. FT.
AMERICAN	Nº 25	STANDARD 12" × 17" RANDOM 5"-7" & 12"-17" *	¼" TAPERED	DUO-BLEND GRAY MULBERRY DUO-BLEND RED BRETON RED SABLE BLACK DUO-BLEND GREEN MOSS GREEN SAGE GREEN COPPER	560 565	7½"	160 STD WIDTHS ONLY	1¾ LBS 1¼" NAIL	NONE	Nº 26	100
	Nº 35	STANDARD 8½" × 17" * RANDOM 6" - 8½" & 11" × 17"	¼" TAPERED	GRANADA RED TOURAINE RED EBON BLACK OLIVE GREEN SEA GREEN	565	7½"	225 †	2¼ LBS 1¼" NAIL	NONE	Nº 36	72
	Nº 45	STANDARD 8½" × 17" * RANDOM 6" - 8½" & 11" × 17"	¼" TAPERED	SILVER GRAY	510	8" USED FOR SIDING	210 †	2¼ LBS. 1¼" NAILS	NONE	Nº 36 OR Nº 45 SHINGLE WITH HEAD CUT OFF	72
	Nº 55	STANDARD 8" × 16" RANDOM 6-8-10 & 16" × 16 *	5/16" AND 7/16" TAPERED	Nº 1 WEATHERED GRAY 2 WEATHERED BLACK 3 OLIVE GREEN 4 SEA GREEN 5 FOREST BROWN 6 AUTUMN BROWN 7 GRANADA RED 8 TOURAINE RED	5/16" BUTT 625 7/16 BUTT 840	7"	260 †	3 LBS 1½ NAIL	NONE	Nº 56	72
DIAMOND THATCH 	Nº 90	16⅞" × 16⅞"	3/16" UNIFORM	MOTTLED GRAY MOTTLED BLUE BLACK DUO-BLEND RED DUO-BLEND GREEN COPPER	260 270		68	¾ LBS 1¼" NAIL	68	NO. 17 AND NO 91	75 45
HEXAGONAL	Nº 70	16" × 16"	3/16" UNIFORM	MOTTLED GRAY " " RED " " BLUE BLACK MULBERRY MOTTLED GREEN DUO BLEND RED DUO BLEND GREEN COPPER	305 315	13" × 13"	87	1 LB 1¼" NAILS	87	NO 17 AND NO 71	75 58
DUTCH LAP	Nº 30	16¼" × 16¼"	3/16" UNIFORM	MOTTLED GRAY " " RED " " GREEN " " BLUE BLACK MULBERRY DUO-BLEND RED DUO-BLEND GREEN COPPER	318 328	14" × 12 3/16 ¼ SIDE LAP ⅓ " " 14" × 10.8"	90 100	1 LB 1¼" NAIL	90 100	NO. 31	99
RIDGE AND HIP FINISH BOSTON	Nº 27 Nº 37 Nº 57	LENGTH 16" WIDTH BUTT 5 11/32" HEAD 4 9/32"		AVAILABLE IN ALL COLORS AND TEXTURES PROCURABLE IN Nos 25-35 & 55 SHINGLES		7"	PIECES REQUIRED PER 100 LIN. FT 340 NOTE: USABLE WITH SHINGLES Nº 25-35-& 55				
RIDGE ROLL 	RIDGE ROLL	16" LONG 2 15/16" RAD	3/8"	GRAY RED BLUE BLACK GREEN		13"	PIECES REQUIRED PER 100 LIN. FT 93				

*IN USING RANDOM WIDTHS, EQUAL PROPORTION OF THE 6" & 10" (Nº 55s) - 6" & 11" (Nº 35s) OR 5" & 7" (Nº 25s) MUST BE ACCEPTED.
FROM A STANDPOINT OF APPEARANCE THE USE OF THE 16" WIDTH IN A SALEM ROOF IS NOT RECOMMENDED THIS WIDTH IS PROVIDED FOR USE IN FORMING MITERED HIPS.

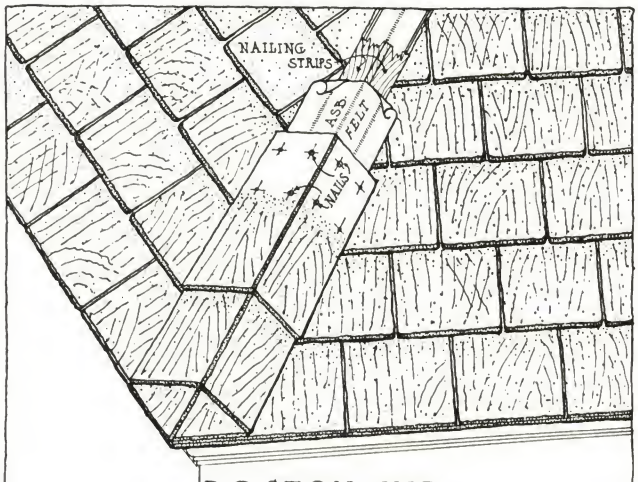
†USING STANDARD WIDTHS OR EQUAL PROPORTIONS OF RANDOM WIDTHS APPLIED WITH BUTTS ALIGNED.
IN RE-ROOFING WORK OVER EXISTING SHINGLES, NAILS NOT LESS THAN 2" LONG SHOULD BE USED.



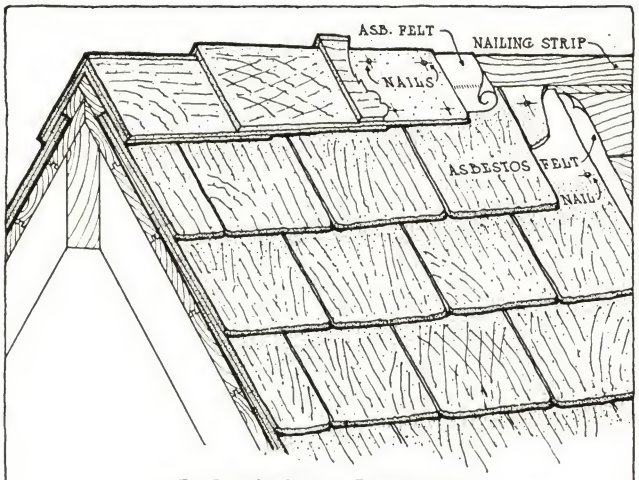
· NUMBER · THIRTY · FIVE · SHINGLES ·
· RANDOM · WIDTHS · BUTTS · STAGGERED ·



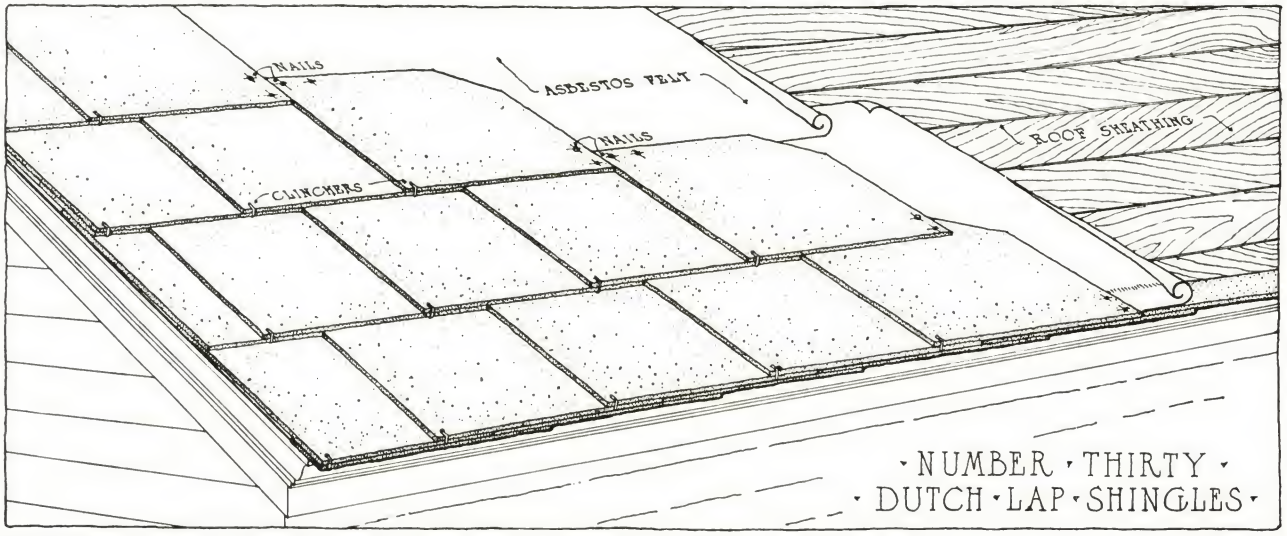
· NUMBER · TWENTY · FIVE · SHINGLES ·
· STANDARD · WIDTHS · BUTTS · ALIGNED ·



· BOSTON · HIP ·



· BOSTON · RIDGE ·



· NUMBER · THIRTY ·
· DUTCH · LAP · SHINGLES ·

· JOHNS-MANVILLE ASBESTOS SHINGLES ·

APPLICATION DETAILS FOR Nos THIRTY FIVE · TWENTY FIVE & THIRTY · SHINGLES

Short Form Specifications for Furnishing and Applying Johns-Manville Asbestos Shingles

Work Included*

The work contemplated under this specification shall include all materials, labor, equipment and services necessary for and reasonably incidental to the installation of Johns-Manville Asbestos Shingles to *(state in detail surfaces to be covered)* as shown on drawings or herein specified.

Work Not Included*

The following work will be furnished and installed as specified under other divisions of the specification which this contractor shall read to ascertain what is called for therein:

(a) All materials composing the roof construction leaving all surfaces smooth and clean, in a satisfactory condition to receive the roofing.

(b) Fascia or crown moulding, to project above the roof sheathing sufficient to give the proper "cant" required by the thickness of the shingles; or a "cant" strip of suitable size parallel and flush with the eaves to give the proper "cant" required by the thickness of the shingles.

(c) Furring strips of suitable size and shape on all hips and ridges to receive the ridge and hip finish shingles or ridge roll.

(d) All flashings, sheet metal valley and gutter linings, eaves troughs or hung gutters, leaders and all other sheet metal work. Sheet metal of proper dimensions for such flashings as must necessarily be installed during the application of the asbestos shingles shall be furnished by other contractors to be installed by the roofing contractor.

Note: *Where the job involves re-roofing over existing wood shingles the following should be added if the construction described is desired.*

(e) Remove existing wood shingles adjoining the gable rakes for a width of approximately 4 or 6 in. and install in place thereof a wood strip of the same width and of the approximate thickness of the existing wood shingle roof. Install in all open valleys to the full width wood strips of the approximate thickness of the existing wood shingle roof to bring such areas to the same plane as the existing roof.

*Where it is the custom or it is desired that the Roofing Contractor include the furnishing and setting of any or all of the items included under "Work Not Included," such items shall be incorporated under "Work Included," in detail or "in accordance with the standard specification of the *(sheet metal, etc.)* manufacturer."

The flashing requirements of an asbestos shingle roof are similar both from the standpoint of materials used and method of application to that of a roof covered with wood shingles or slate, etc. The selection of the material to be used is left to the architect, it being recommended that copper or other non-corrodible sheet metal be used, installed in accordance with the standard specifications of the manufacturer. The question as to whether the flashing is to be included by the roofing contractor or others is also left to the architect, it being understood that the setting of certain flashings must be done by the former as covered in Paragraph (d).

Materials and Workmanship

All work under this specification and contract shall be executed in strict conformity with the "Standard Specification of Johns-Manville for the Furnishing and Applying of Asbestos Shingles," which standard specification is hereby declared and made a part of this specification with the same force and effect as if written herein in full.

Felt

Note: *Omit if application is over existing wood shingles.*

Before applying the asbestos shingles herein specified, all surfaces shall be covered with Johns-Manville *(state whether "Asbestos Slaters' Felt weighing approximately 15 lb. per 108 sq. ft." or "Asbestos Waterproofing Felt weighing approximately 35 lb. per 108 sq. ft.")*

Shingles

Shingles shall be *(state catalogue number and color or proportions of colors; if No. 55, thickness or proportions of thicknesses; if Nos. 55, 25, 35 or 45, whether "random" or "standard" widths, and whether to be applied with the butts "aligned" or "staggered.")*

(If to be applied in more than one color the following shall be added:

"The shingles shall be applied with the colors mixed as directed by the architect, in the proportions specified.")

Ridge and Hip Finish

All ridges and hips shall be finished *(state whether "Boston Method" or "with Johns-Manville Ridge Roll").*

Valleys

All valleys shall be *(state whether "open" or "closed." The closed valley cannot be used with the No. 30, 70 or 90.)*

Fasteners

Each shingle shall be secured with not less than two *(state whether "copper" or "hot dipped galvanized iron")* shingle nails (the following to be added only if ridge roll is to be used) and each section of ridge roll shall be secured with two nails driven through one copper ridge roll fastener. *(If No. 30, 70 or 90, add: "Each shingle shall also be secured with one copper clincher.")*

Condensed Specification

Note: *This specification does not cover preparatory work by other contractors, neither does it provide for flashing or other sheet metal work, etc. The paragraph headed "Felt" is to be omitted if application is over existing wood shingles.*

Shingles—All *(state in detail surfaces to be covered)* shall be covered with Johns-Manville Asbestos Shingles, applied in strict accordance with the standard specifications of the Manufacturer.

The shingles shall be *(state catalogue number, color or proportions of colors; if No. 55, thickness or proportions of thicknesses; if No. 55, 25, 35 or 45, whether "random" or "standard" widths and whether to be applied with the butts "aligned" or "staggered.")*

Felt—Before applying the shingles, all surfaces shall be covered with Johns-Manville *(state whether "Asbestos Slaters Felt weighing approximately 15 lb. per 108 sq. ft." or "Asbestos Waterproofing Felt weighing approximately 35 lb. per 108 sq. ft.")*

Ridges and Hips—All ridges and hips shall be finished *(state whether "Boston Method," or "with Johns-Manville Ridge Roll").*

Valleys—All valleys shall be *(state whether "open" or "closed." Must be "open" with No. 30, 70 or 90).*

Nails—Each shingle shall be secured with not less than two *(state whether "copper" or "hot dipped galvanized iron")* shingle nails. *(If No. 30, 70 or 90, add "and one copper clincher.")*

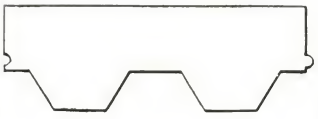
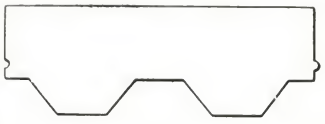
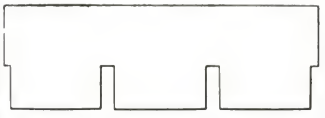
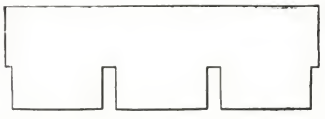
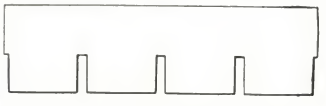
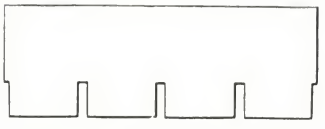
JOHNS-MANVILLE ASPHALT SHINGLES

Johns-Manville Asphalt Shingles are made of heavy felts impregnated with the finest asphalt and surfaced with crushed mineral. They are made as strip shingles, both Hexagonal and American styles and as individual shingles, American style.

These shingles are made in a variety of colors chosen by a committee of architects and building authorities. Included are monotones and blends. Among the latter are the "Duo-Blend" effects in which a darker base color is overlaid intermittently with a lighter color. The colors in which the various styles are obtainable and other technical data are given in the chart on the following page.

The Thick Butt Strip Shingles are a recent addition to the line. As the name implies they have thick butts, being a re-dipped product with sealed edges.

STYLES, COLORS AND APPLICATION DATA FOR JOHNS-MANVILLE ASPHALT SHINGLES

Names and colors	Shape	Size, in.	Exposure, in.	Head lap, in.	Strip per sq.	Approx. weight per sq. lb.
Giant Hexagonal Shingles **Colors—** Fieldstone Green Standard Blue-black Tile Red Blended Normandy Greens Blended Romany Reds Brittany Blend Burgundy Duo-Blend Gascony Duo-Blend Charmaine Green		36 x 12⅓	4⅔	3	86	225
Standard 12⅓-in. Hexagonal Shingles **Colors—** Tile Red Fieldstone Green Standard Red Standard Blue-black Blended Romany Reds		36 x 12⅓	4⅔	3	86	175
Standard 11⅓-in. Hexagonal Shingles **Colors—** Fieldstone Green Standard Red Standard Blue-black Tile Red Blended Normandy Greens Brittany Blend Blended Romany Reds Burgundy Duo-Blend Gascony Duo-Blend Picardy Duo-Blend Chateau Green		36 x 11⅓	4⅔	2	86	160
Standard 12½-in. Double Coverage Hexagonal Shingles **Colors—** Fieldstone Green Standard Blue-black Tile Red Blended Normandy Greens Blended Romany Reds		36 x 12½	4	4½	100	215
Giant Strip Shingles **Colors—** Fieldstone Green Standard Blue-black Tile Red Blended Romany Reds Blended Normandy Greens Brittany Blend Charmaine Green		36 x 12	5	2	80	245
Thick Butt Strip Shingles **Colors** Fieldstone Green Standard Blue-black Tile Red Romany Blend Granada Blend Killarney Green Blend		36 x 12	5	2	80	200
Standard Strip Shingles **Colors—** *10-in. Width* Fieldstone Green Standard Red Standard Blue-black Blended Normandy Greens Chateau Green Brittany Blend Tile Red Blended Romany Reds		36 x 10	4	2	100	195
12½-in. Width Fieldstone Green Standard Red Standard Blue-black Brittany Blend		36 x 12½	4	4½	100	240
Giant Individual Shingles **Colors—** Fieldstone Green Standard Blue-black Tile Red Blended Romany Reds Brittany Blend Charmaine Green		12x16	5	6	225	315
Standard Individual Shingles Fieldstone Green Standard Red Standard Blue-black Brittany Blend Tile Red Blended Romany Reds		9x12¾	4	4¾	378	240
Bric-Side Shingles *A Siding shingle giving the appearance of brickwork* Red, Buff, Bright Red and Bright Red with White mortar joint		30x6	2½	1	192	210

KEASBEY & MATTISON COMPANY

AMBLER, PA.

BRANCHES

BALTIMORE, MD.
BOSTON, MASS.
CHICAGO, ILL.
CLEVELAND, OHIO
DETROIT, MICH.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
ST. LOUIS, MO.

WEST COAST DISTRIBUTOR: Farrington Engineering Co., LOS ANGELES, CALIF.

Ambler Asbestos Products

Manufactured by Ambler Asbestos Shingle and Sheathing Company and sold by combined sales force under the name of the parent company, KEASBEY & MATTISON COMPANY.

AMBLER ASBESTOS SHINGLES for roofs and sidewalls; AMBLER ASBESTOS CORRUGATED SHEETS for industrial roofing and siding.

For our page on Magnesia and Air Cell Heat Insulation and Packings, Ambler Asbestos Waltile, Ambler Linabestos Wallboard and Ambler Asbestos Lumber, see Manufacturers' Index.

The Company and Its Products

Ambler supplies all the necessary appurtenances required in the installation of its products, including roofing paper and specially cut and punched shingles for starting courses. All nails, clips, etc., exposed to the weather are heavy gauge copper, and concealed nails are triply galvanized. Copper driving nails supplied if desired.

Ambler Asbestos Shingles

Ambler Asbestos Shingles are fireproof, fadeproof, weatherproof, and made in a variety of styles, colors and thicknesses. They are made of selected asbestos fibers from our own mines, scientifically combined with portland cement and formed under tremendous hydraulic pressure.

"Weathered Effect"—Shingles have a rough surface to give the weathered appearance of a shingle roof exposed to the elements for many years. "Lindenwold" is the name applied to those rough-surface shingles which resemble in color tones a century-old roof, being a black shingle with faint green markings. Other color tones are furnished in this "Weathered Effect" Shingle. See table.

Exposed Portion of "Weathered Effect" Ambler Asbestos Shingle

FIREPROOF Ambler ASBESTOS SHINGLES

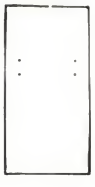
"Rustic Blend"—This name is applied to a special color blend of Styles 99, 100, 90 or 91 (described below). It consists of 30% each of three shades of soft purplish brown and 10% buff. Other percentages may be specified if desired.

Detailed Description

A tabular description of popular styles of both uniform thick and tapered Ambler Asbestos Shingles is given below:

No. 99 "Weathered Effect" Tapered—
9¼x18½ ins. x ½-in. butt
Colors: Lindenwold, Royal Red, Rustic Blend and Green
190 pieces per square
Random widths of 6, 12 or 18 ins. at $1.25 per square additional
Approximate weight, 900 lbs. per square
Weather exposure, 8¼ in.

No. 100 "Weathered Effect" Tapered—
9¼x18½ ins. x $\frac{5}{8}$-in. butt
Colors: Lindenwold, Royal Red, Rustic Blend, Green
190 pieces per square
Random widths of 6, 12 or 18 ins. at $1.25 per square additional
Approximate weight, 625 lbs. per square
Weather exposure, 8¼ in.



No. 90 Tapered Colonial—
9¼x18½ ins. x ¼-in. butt
Colors: Pearl Gray, Gray Duoface, Red, Black, Rustic Blend and Green
190 pieces per square
Random widths of 6, 12 or 18 ins. at $1.00 per square additional
Approximate weight, 525 lbs. per square
Weather exposure, 8¼ in.

No. 91 Uniform Thick American Method—
9¼x18½ ins. x $\frac{3}{16}$ in.
Colors: Pearl Gray, Gray Duoface, Red, Black, Rustic Blend and Green
190 pieces per square
Approximate weight, 435 lbs. per square
Weather exposure, 8¼ in.

NAILS AND NUMBER OF SHINGLES PER SQUARE REQUIRED FOR NO. 99, NO. 100 AND NO. 90 SHINGLES

Widths	6 in.	9 in.	12 in.	18 in.
Shingles per square	285	190	143	95
No. 99—2 in. long	3¾ lbs.	2½ lbs.	2 lbs.	1¼ lbs.
No. 100—1½ in. long	2¾ lbs.	2 lbs.	1½ lbs.	1 lb.
No. 90—1¼ in. long	2½ lbs.	1¾ lbs.	1¼ lbs.	1 lb.

Specification

We suggest the following clause for architects to include in their general specifications, covering roofing.

Roofing material shall consist of Ambler Asbestos Shingles, Style No. ....., color ....., laid in accordance with specifications of the manufacturer, the Ambler Asbestos Shingle & Sheathing Company, Ambler, Pa.

No. 91 Ambler Asbestos Shingles
Described on preceding page

Lindenwold Shingles in 5/16 and 1/2-in. Butts
Laid in random widths and exposures

Other Styles of Ambler Asbestos Shingles (Uniform Thick)

No. 16 American Method, size 8x16 ins. x $\frac{5}{32}$ in., made in eight colors, 260 pieces per square, weighing approximately 416 lbs.; laid with 7-in. weather exposure.

No. 4 Honeycomb type. Size 16x16 ins. x $\frac{5}{32}$ in., made in eight colors, 87 pieces per square, weighing approximately 270 lbs.; weather exposure 13x13 ins.

No. 64 Honeycomb type. Size 18x18 ins. x $\frac{3}{16}$ in. made in six colors, 64 shingles per square, weighing approximately 250 lbs.; weather exposure 15x15 ins.

No. 30 Side Lap (Dutch Lap Method of application). Size 16¼x16¼ ins. x $\frac{5}{32}$ in., made in eight colors, 89 pieces per square weighing approximately 280 lbs.; weather exposure 12¼x13¼ ins.

For information on starters, ridge roll and Boston hip and ridge, please refer to our illustrated price list giving full details on all starters and accessories.

Distinctive Effects

By means of a new color process, Ambler can create for the architect in Rough Surface Shingles practically any shade desired, by overprinting one color on another. The colors are fadeproof and will last indefinitely.

Unusual and distinctive effects may be obtained with Ambler Asbestos Shingles by the roofer breaking butts or using random exposures to produce irregular roof lines so popular today on certain types of houses.

Ambler Duoface Process

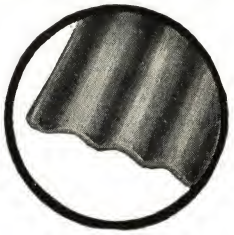
This is the name applied to the new process which produces a lasting, fadeproof colored Ambler Asbestos shingle that is reversible and can be laid either side up. On one side coloring matter is added during the process of manufacture and becomes a part of the shingle itself. The other side is the natural Newport Gray, resulting from the mixture of asbestos fibre and portland cement. The Gray Duoface has on its colored side a pleasing combination of red, black and gray. A wider color range is available by this process, at a price much lower than formerly charged for colored asbestos shingles.

Application and Literature

To any one requesting it, a leaflet on "How to Apply Asbestos Shingles" is available. The Ambler Asbestos Catalogue also carries full instructions as well as detailed descriptions of the various types and illustrations in full color.

Ambler Asbestos Corrugated Roofing and Siding

This material is made of asbestos fibre and portland cement and is the same as Ambler Asbestos Shingles in its structure and quality. It is made in sheets of from 4 ft. to 8 ft. 6 in. in length and 42 ins. wide. Corrugations are 2⅝ ins. center to center.



Two thicknesses are available. The heavier material is $\frac{11}{32}$ in. thick at ridges and valleys and $\frac{9}{32}$ in. thick at center of slope. This has an approximate weight of 3¾ lbs. per sq. ft.

Ambler also furnishes a corrugated sheet $\frac{3}{16}$ in. thick throughout, having an approximate weight of 2¼ lbs. per sq. ft. Write for engineers' data sheets for full detail.

Ambler Asbestos Sectional School Buildings

These fireproof buildings are regular sectional type buildings, made of Ambler Asbestos Lumber, and can be erected in a very short time by local carpenters. Plans and specifications will be furnished upon request.

A Colorful Ambler Roof
The crowning touch to an artistic setting

Ambler Weathered Effect Shingle Roof Adds Neatness to the Building Design

R. J. DORN CO., INC.

Manufacturers of "Asbestone" Asbestos-cement Corrugated Roofing and Siding for Industrial Buildings

NORTHERN GENERAL SALES OFFICES
82 Beaver Street, NEW YORK, N. Y.

FACTORY AND SOUTHERN SALES OFFICES
NEW ORLEANS, LA.

Copyright 1930 by R. J. Dorn Co., Inc.

Products

"Asbestone" Asbestos-cement Corrugated Roofing and Siding, with complete line of accessories, finishing pieces, fasteners, etc.

Description

"Asbestone" is an industrial roofing and siding sheet, made entirely of highest grade portland cement and long asbestos fibre, formed under enormous hydraulic pressure into dense corrugated sheets of more than ample structural strength for direct installation on purlins and girts of skeleton steel or wood frame. No supporting deck is required. The corrugation is scientifically designed, with proper contour and flank depression, providing perfect weather-tight meshing of individual sheets—an essential feature.

Permanence

"Asbestone" is truly and positively permanent. As its name implies, it is *manufactured rock*, composed of inorganic minerals and containing no metal nor any substance capable of corroding or deteriorating in any way. "Asbestone," owing to its very nature, cannot possibly rust, rot, warp or decay, and is immune to the destructive forces of the atmosphere, such as climatic conditions of the most severe kind, extremes of weather, heat, frost, rain, humidity, salt air, industrial fumes, acids, alkalis, etc. Instead of deteriorating, it actually hardens and improves with exposure to the elements (a well-known property of concrete).

Fire Protection

Strictly non-combustible, "Asbestone" offers a safeguard against flying sparks and brands. It reduces the hazard of conflagration to a minimum.

Appearance

"Asbestone" is neat, attractive and essentially correct for industrial buildings.

Colors—Natural gray and brick red. Other colors on special order.

Economy

"Asbestone" effects two fundamental economies, viz.:

(1) Construction Economy—"Asbestone" works in ideally with the most economical type of industrial construction — the skeleton frame. Only the lightest steel or wood frame, inexpensive and quickly erected, is required to support it.

"Asbestone" itself is applied easily and swiftly, at minimum labor cost.

(2) Elimination of Maintenance—A building covered with "Asbestone" is covered once for all. No further expenditure is required for painting, maintenance or repairs.

"Asbestone" is the very embodiment of true economy.

Quality

R. J. Dorn Co., Inc. is the *only* manufacturer specializing exclusively in the manufacture and erection of corrugated asbestos-cement roofing and siding. This total concentration on *one single product* has enabled the Dorn Company to reach perfection in its field.

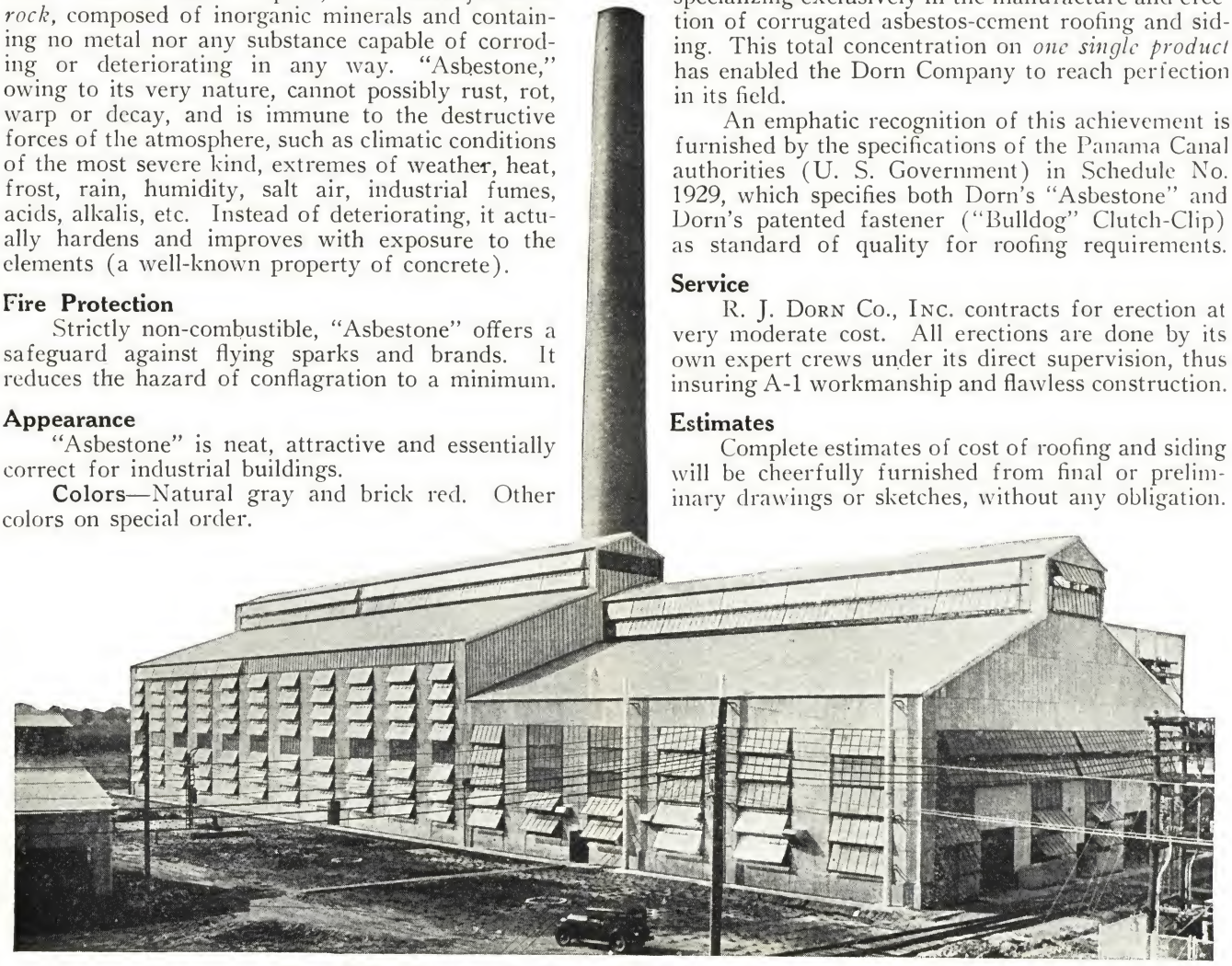
An emphatic recognition of this achievement is furnished by the specifications of the Panama Canal authorities (U. S. Government) in Schedule No. 1929, which specifies both Dorn's "Asbestone" and Dorn's patented fastener ("Bulldog" Clutch-Clip) as standard of quality for roofing requirements.

Service

R. J. Dorn Co., Inc. contracts for erection at very moderate cost. All erections are done by its own expert crews under its direct supervision, thus insuring A-1 workmanship and flawless construction.

Estimates

Complete estimates of cost of roofing and siding will be cheerfully furnished from final or preliminary drawings or sketches, without any obligation.



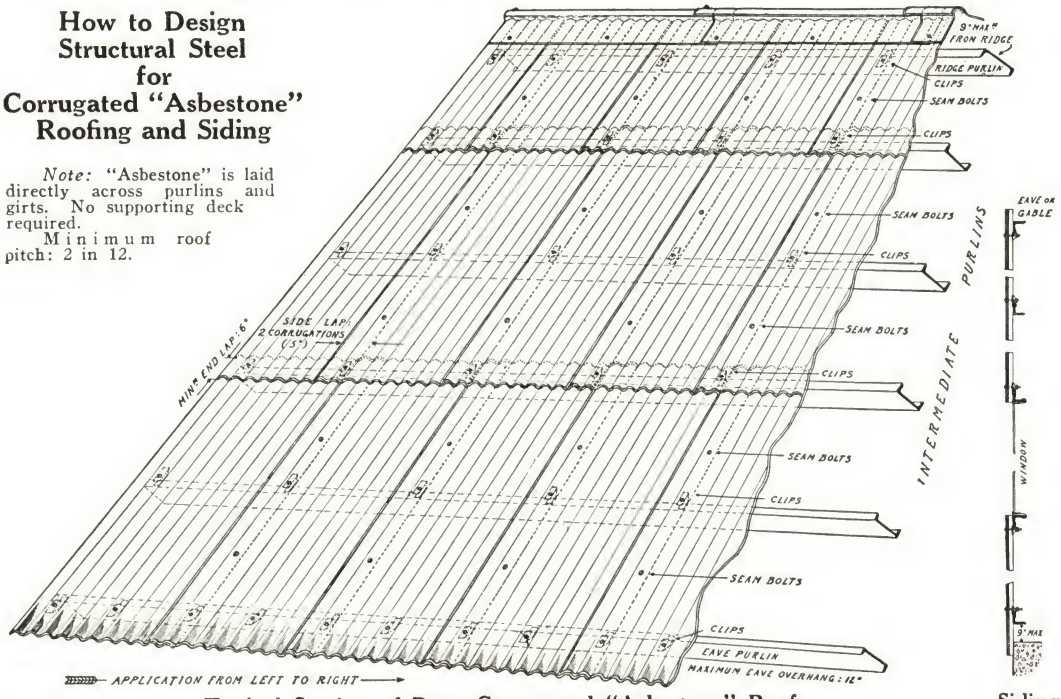
Giant Boiler House of the Texas Gulf Sulphur Co. at Boling, Texas

Net area of roofs and sides: 75,000 sq. ft. Entirely roofed and sided with corrugated "Asbestone." Complete installation, including all flashings, by R. J. Dorn Co., Inc.

How to Design Structural Steel for Corrugated "Asbestone" Roofing and Siding

Note: "Asbestone" is laid directly across purlins and girts. No supporting deck required.

Minimum roof pitch: 2 in 12.



Typical Section of Dorn Corrugated "Asbestone" Roof

Showing staggered joint application.
Sheets furnished with clipped corners for straight vertical joint, if desired

Siding Section

The best results will be obtained by turning flanges of purlins as illustrated on diagram.

Eave and ridge purlins should have flange turned *down*. All intermediate purlins should have flange pointing *up* to the ridge.

For siding, turn flanges of channels or vertical leg of angle *up* wherever feasible.

However, if the above recommendations cannot be followed, we have fasteners to meet all steel conditions.

Steel members should be spaced for the respective thicknesses of "Asbestone" as listed in span table below.

We recommend spacing all purlins evenly. Place odd spans, if any, at eave or ridge.

Sheet Sizes—Corrugated "Asbestone" is made in sheets 27½ in. wide, up to 10 ft. long, and in the various thicknesses listed below.

Standard lengths: 4′, 5′, 6′, 7′, 8′, 8′6″, 9′, 9′6″, 10′.

Special lengths to order.

Thicknesses—We make 3 standard thicknesses for purlin and girt spacings as follows:

Code word	Thickness		Spans up to		Weight, lb.	
	At flank of corrugation	At crest of corrugation	For roofing	For siding	Per sq. ft. of material	Per sq. ft. of net area
Economy	1/4″	5/16″	4′ 3″	5′ 0″	3¾	5
Standard	9/32″	11/32″	4′ 9″	5′ 6″	4¼	5¾
Heavy	5/16″	3/8″	5′ 3″	6′ 0″	4¾	6½

Special thicknesses for special conditions to order.

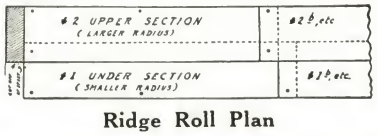
Overlaps—Corrugated "Asbestone" sheets are overlapped 2 corrugations (5 in.) on sides, and 6 in. minimum on ends.

Economical Steel Member Spacing—To obtain the most economical layout, steel should be spaced for use of standard sheet lengths. Long sheets should be used in preference to short sheets. The following spans will accommodate standard lengths with 6 in. end overlap.

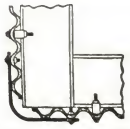
Length of sheet	Actual width of spans	
	2 spans per sheet	3 spans per sheet
10′ 0″	4′ 9″	3′ 2″
9′ 6″	4′ 6″	3′ 0″
9′ 0″	4′ 3″	2′ 10″
8′ 6″	4′ 0″	2′ 8″
8′ 0″	3′ 9″	.....
7′ 0″	3′ 3″	.....
6′ 0″	2′ 9″	.....

Finishing Pieces—For roof ridge and corners of building.

Ridge Roll Perspective



Ridge Roll Plan



Corner Roll (Horizontal Section)

Ridge roll, *self-adjustable* to any roof pitch, is made in 2 concentric sections 48 in. long, of inner and outer radii, and tapered on full length, thus insuring perfect meshing throughout at all laps.

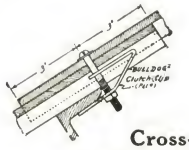
Apron of ridge roll is cemented underneath with asbestos-cement mortar.

Corner roll is in single 90° sections, 48 in. long, also tapered lengthwise.

Ridge and corner roll sections are overlapped on ends, *eliminating unsightly battens,* and bolted on with ¼x2-in. brass bolts with brass nuts and brass and lead washers. *(See: Side Lap Seams.)*

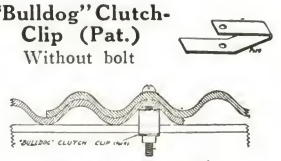
Fasteners—Corrugated "Asbestone" sheets are fastened to steel members at end and side laps, corresponding to 1 fastener per net width of sheet (every 22½ in.) at all purlins and girts.

At eave purlin on roof, an additional fastener is used in center of all sheets.

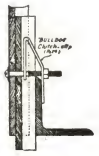


Cross-section of "Bulldog" Assembly at End Lap

"Bulldog" Clutch-Clip (Pat.)
Without bolt

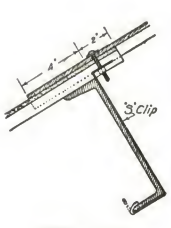


Cross-section of Bulldog" Assembly at Side Lap

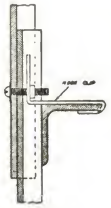


Siding

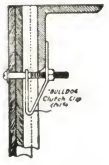
For fastening to steel frame designed in accordance with the above recommendations, use our patented hot galvanized "Bulldog" Clutch-Clip with ¼ in. diameter by 3-in. round slotted head brass bolt, brass nut and brass washer. "Bulldog" Clutch-Clip secures sheets to frame with absolute safety, while making ample provision for expansion and contraction of the steel members.



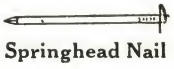
"S" Clip



Hook Clip



"Bulldog" Clutch-Clip Reversed



Springhead Nail

Fastening to Wood Members

For fastening to channels or angles with flange or vertical leg turned down, we furnish hot galvanized "S" and hook clips with ¼ in. diameter by 2-in. brass bolt with nut and washer, as shown above. (Best results will be obtained by using "S" clips and hook clips at end laps of sheets, and "Bulldog" Clutch-Clips reversed at eave and ridge purlins and at intermediate purlins and girts.)

For fastening to wood members, use Dorn Zinclad Springhead Nails, 3 in. long (requiring no washer), or ¼ in. diameter by 3-in. round head brass screws, with brass washers. Use 2 nails or screws per sheet at all wood members (1 at side lap—1 in center of sheet).

Side Lap Seams—Sheets are bolted together at side laps in center of all purlin and girt spans with ¼ in. diameter by 1½-in. brass bolts with brass nuts as above, with brass washer under head and lead washer between nut and sheet.

Side Lap Seam Bolt

Cementing—All heads of bolts, nails or screws are cemented with Dorn "Duralastic" Cement Compound, sealing all fastener holes hermetically.

On roofs with pitch of less than 3 in 12, all end and side laps of sheets must be cemented with the same compound.

Flashings—For flashing at intersections of roofing and siding, windows and doors, etc., we recommend No. 10 gauge pure zinc, 16-oz. copper or 2½-lb. soft lead, fastened with ¼x1½-in. brass bolts as above.

JOHNS-MANVILLE

EXECUTIVE OFFICES
292 Madison Avenue, NEW YORK, N. Y.

For Branch Offices, see Section on Wall Tile

Products

JOHNS-MANVILLE TRANSITE, FLAT and CORRUGATED. Also Packings for all purposes; Refractory Cements; Waterproofing and Dampproofing; Asbestos Ebony; Asbestos and Asphalt Roll Roofing; Rotproof Roofs; Asbestos products of all kinds.

For the following Johns-Manville products, see Manufacturers' Index: Acoustical Treatment and Sound Isolation; Shingles; Built-up Roofing; Home Insulation; Insulating Board and Insulating Lath; Insulations; Tile Flooring; Wall Tile.

JOHNS-MANVILLE TRANSITE, FLAT AND CORRUGATED, AND ASBESTOS WALLBOARD

Transite Corrugated Asbestos

Transite Corrugated Asbestos Roofing and Siding is made of asbestos fibres and portland cement united under great hydraulic pressure into dense, unlaminated, monolithic sheets of great strength and rigidity. It is designed for application directly over purlins or girts of skeleton steel or wood frame construction. It will not burn or rust, rot, split, crack or curl. It offers high resistance to acid fumes and atmospheric conditions which are fatal to many materials. It does not require paint as a preservative.

Transite can be readily punched, drilled or sawed and is secured with bolts, nails, screws, clips, etc., designed for that purpose.

Special shapes for use as ridge roll, corner roll, louvres, etc., are available, made of the same materials.

Sizes—The sheets are furnished 42 in. wide in lengths up to 11 ft. They are $\frac{7}{16}$ in. thick at ridges and valleys of corrugations and $\frac{5}{16}$ in. thick at the slope. The corrugations are 4.2 in. pitch. The overall thickness of the sheets is 1½ in.

The sheets are laid with an end lap of 6 in. and a side lap of one corrugation providing an exposed width of 37.8 in.

Weight—Approximately 4.1 lb. per sq. ft. or approximately 5 lb. per sq. ft. applied.

Color—Light gray.

Spacing of Supports—This material may be applied over supporting members spaced not to exceed the following: Purlins (roofing) 60 in. center to center. Girts (siding) 72 in. center to center.

Minimum Roof Pitch—Transite Corrugated may be applied to roofs having a slope or pitch of 2 in. to 1 ft. or greater.

Application—The method of applying this material is similar to that followed in applying other corrugated sheet materials.

Transite Flat

Transite Asbestos Wood is composed of the same materials and has the same characteristics as Transite Corrugated, but is furnished in flat sheet form. It has innumerable uses.

Sizes—The sheets are furnished 36x48 in., 42x48 in. and 42x96 in. in thicknesses of $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, 1¼, 1½, 1¾ and 2 in. and greater up to 4 in. on special order.

Special Shapes—Ventilators, ducts and other special shapes are procurable on special order.

Asbestos Wall Board

Johns-Manville Asbestos Wall Board is composed of asbestos fibre, Portland cement and coloring matter formed under hydraulic pressure into laminated sheets, strong, rigid, durable and fireproof. It is of a light cream color.

Although it has many of the characteristics of Transite it should not be used where subjected to severe conditions of heat, acid fumes and weather exposure. It may be most successfully employed as a fireproof material for lining garages and for covering walls and ceilings generally where the use of a wallboard possessing fireproof qualities is desirable or necessary.

Size—The sheets are furnished 48x48 in. and 48x96 in. in thicknesses of $\frac{3}{16}$, ¼ and ⅜ in.

Short Form Specification for Furnishing and Applying J-M Transite Corrugated Asbestos Roofing and Siding

Roofing and Siding

Where shown or indicated on drawings, the roofs and sides of building shall be covered with Transite Corrugated Asbestos Roofing and Siding (4.2 in. pitch) as manufactured by JOHNS-MANVILLE. The material shall be of solid monolithic, unlaminated construction, weighing approximately 4.1 lb. per sq. ft. and to be approximately $\frac{7}{16}$ in. thick at ridge and valley of corrugations and approximately $\frac{5}{16}$ in. thick on slope.

Sheets shall be 42 in. wide and of suitable length so that all end laps shall occur over a purlin or girt. Sheets shall be furnished with cut corners enabling material to be laid with side laps forming vertical lines.

Sheets shall be laid with 6 in. end lap and one corrugation side lap.

All side and end laps shall be formed with J-M Black Asbestos Roof Putty between the sheets.

Flashing (and Building Trim)

Where indicated on drawings Ridge Roll, Corner Roll, Louvres, and Flashing shall be of the same material as the roofing and siding. All other flashing to be of 4 lb. sheet lead.

Fasteners

J-M (corrosion-resisting finish) Fasteners shall be used. Heads of all fasteners on weather side of building shall be protected with J-M Asbestos Roof Putty, or with a heavy coat of white lead.

Method of Application

The method of application shall be in strict accordance with the manufacturer's standard erection instructions.

Note: Spacing of Supports: (to be provided for in specifications covering roof and wall framing):

The spacing of roof purlins shall not exceed 60 in. center to center; siding girts shall not exceed 72 in. center to center.

COUNTER-FLASHING RECEIVER CO.

Manufacturers of Permanent Leakproof Flashings

1548 West Bruce Street
MILWAUKEE, WIS.

AGENTS IN ALL PRINCIPAL CITIES

Product

SCHNEIDER COUNTER-FLASHING RECEIVER, a permanently built-in, leakproof metal raglet for masonry parapets and walls. Receives and securely holds, without calking, the standing flat-roof counter-flashing. Fully protected by patent.

Materials

16-ounce, cold rolled copper. 26-gauge galvanized armco iron. Furnished in 8-ft. lengths.

Adaptability

Adapted to all classes of buildings with flat or slight pitch composition roofs such as those of industrial and commercial buildings, hotels, apartments, schools, etc.

Advantages

Furnished and installed by mason. Flashing receiver is furnished and built in by the masonry or general contractor with little labor cost as the masonry work of parapets and walls progresses.

Permanence—Made up of non-corrosive metals, it lasts as long as the masonry walls. Permits the removal and replacing of counter-flashing without injury to the receiver.

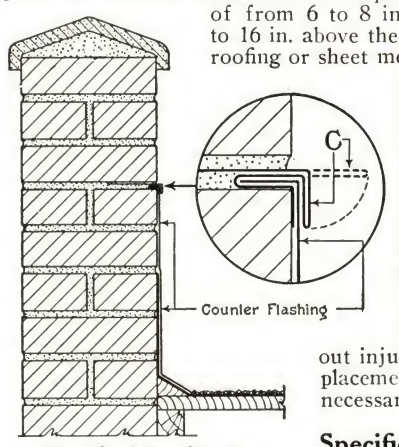
Leakproof—Most roof leaks occur at or about the flashing against parapets and walls. The counter-flashing when set with its top flange inserted in a cut out mortar joint secured with flashing hooks and calking cement is far from permanent and is the vital point where leakage occurs.

The turn-up at the back of the Counter-flashing Receiver body not only securely anchors the receiver in the masonry mortar joint, but it permanently prevents wind driven rain or the water from melting banked snow from passing over the receiver body and penetrating through the mortar joint to the interior of the wall to appear on the walls and ceilings beneath with resultant costly damage.

This positive and permanent assurance against leaks at this most vital point is a prime reason for the inclusion of the receiver on all buildings where counter-flashing is required.

Easily and Quickly Installed—Furnished in convenient lengths of 8 ft., the Counter-flashing Receiver is easily handled and quickly installed by the mason without special tools or skill in metal working.

Reduces Labor Costs—Eliminates the usual labor costs of roofing and sheet metal contractor in cutting out the mortar joint to receive the counter-flashing flange and the initial cost of flashing hooks and calking cement, and the labor of installation.



Detail of Application

Application

The Schneider Counter-flashing Receiver is furnished and set by the mason in the masonry mortar joint. The body of the receiver (A) is set level in the wall with the guide flange (E) pressed close against the vertical masonry face. Splice plates with turn-up at back edge, are furnished to fit snugly into the splicing plate groove (F) to firmly join abutting ends in perfect alignment. Corners and re-entrant angles are easily made without intricate fitting or special tools. On roofs with considerable pitch the receiver is installed in steps maintaining a minimum of from 6 to 8 in. and a maximum of 12 to 16 in. above the roof surface. After the roofing or sheet metal contractor has set the counter-flashing with its top flange inserted in the counter-flashing groove (D), he bends down the projecting flange (C) securely locking the counter-flashing in place, yet allowing for its normal and natural expansion and contraction. The locking flange (C) is easily lifted and re-bent to its customary position without injury when removal and replacement of counter-flashing is necessary in reroofing.

Specification

Include in Masonry Specifications—The Mason Contractor shall furnish and build into all parapet and similar walls where counter-flashing is required [copper] [galvanized armco iron] Schneider Counter-flashing Receiver as manufactured by the COUNTER-FLASHING RECEIVER Co., Milwaukee, Wis.

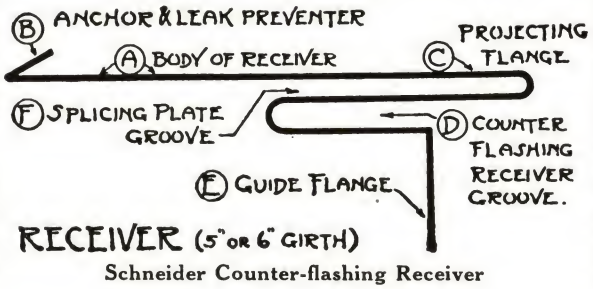
The Counter-flashing Receiver shall be set in the masonry mortar joint in accordance with the manufacturer's details. Butting end joints shall be secured in perfect alignment with splice plates, furnished by the receiver manufacturer, and all corners and re-entrant angles shall be lapped and joined as shown.

The receiver shall be set in a mortar joint approximately 9 in. at its lowest point from the roof level. Where steps are required by changing roof level, these shall occur at points where the maximum height above the roof surface is approximately from 12 to 16 in.

Include in Roofing and Sheet Metals Specification—[Copper] [galvanized armco iron] Schneider Counter-flashing Receiver is furnished and built in by the Mason Contractor (see page ... of specifications and details). This contractor shall insert the top flange of his [copper] [galvanized armco iron] counter-flashing in the receiver counter-flashing groove, and bend the projecting receiver flange over the counter-flashing top.

Note: No counter-flashing hooks or calking cement are required.

Note To prevent electrolysis, the receiver and counter-flashing must always be of the same metal, i.e. copper receiver—copper counter-flashing; galvanized armco iron receiver — galvanized armco iron counterflashing.



Schneider Counter-flashing Receiver

THE CHENEY COMPANY

Cheney Interlocking Thru-Wall Flashing

WINCHESTER, MASSACHUSETTS

NEW YORK, N. Y.
370 Lexington Avenue

PHILADELPHIA, PA.
17th and Sansom Streets

PITTSBURGH, PA.
604 Chamber of Commerce

CHICAGO, ILL.
221 No. La Salle Street

Product

CHENEY INTERLOCKING THRU-WALL FLASHING in all standard sizes. Made of soft copper. Made to order in lead-coated copper, and other metals.

CHENEY

Reg. U. S. Pat. Off.

To Overcome Seepage Leaks

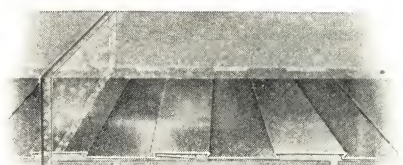
The prevention of seepage and leaks through the exterior masonry walls of the modern building is the very serious problem that confronts every architect and builder.

Seepage causes efflorescence, streaks, stains and discoloration of brick, cement and stone facings, which not only disfigure the appearance of a building, but many times destroy its architectural beauty. Seepage also very frequently develops into more serious leaks, which penetrate a building and deface interior walls and ceilings.

Architects and engineers generally have been reluctant to specify plain sheet metal flashing through the walls because the smooth metal breaks the bond between the courses of masonry and seriously weakens the wall.

Cheney Interlocking Thru-wall Flashing

Is the only proved thru-wall copper flashing that runs entirely through the masonry wall and forms a positive mechanical key-bond in every direction within the mortar bed. It scientifically solves seepage problems and positively prevents leaks, efflorescence, disintegration of walls, and rusting of steel spandrels and lintels.



Phantom View

Cheney Interlocking Wall Flashing positively does not break the bond. It is so designed that when properly laid it forms a positive mechanical key-bond in every direction within the mortar bed, owing to the fact that the flashing is keyed both horizontally and vertically on both sides. The ends of the strips hook together to form a continuous unbroken course of watertight flashing. The design of the flashing also takes care of all expansion and contraction due to temperature changes.

The unbreakable key-bond feature of Cheney Flashing is of the utmost importance in the construction of high buildings where the sway of the structures tends to loosen coping stones and parapet walls with the possibility of loss of life or serious damage should they fall to the ground below.

Economical

Cheney Interlocking Wall Flashing comes ready-to-use and requires no soldering, special fitting or loss of time. It is economical in price and application, generally costing no more than ordinary copper flashing properly formed, soldered and set in place. There is no time lost as the flashing is built into the mortar bed as the masonry progresses.

Dowels and brick keys may be entirely eliminated when Cheney Flashing is used, this saving making the cost of Cheney Flashing less expensive than plain copper soldered in place.

Service

Cheney Interlocking Wall Flashing has been universally accepted and is constantly used by leading architects, engineers, and contractors, and the many outstanding construction jobs throughout the country in which Cheney Flashing has been installed are sufficient proof of its merits.

Our technical staff has acquired a large fund of valuable experience in the use of flashing which is at the disposal of architects and engineers, without charge or obligation.

Specifications

All counterflashing and through-wall flashing shall be Cheney Interlocking Wall Flashing, and shall be placed in the wall with mortar below and on top of flashing, so that a mechanical bond is obtained. These flashings shall be furnished and installed according to the standard specifications of THE CHENEY COMPANY, Winchester, Mass.

Types and Sizes

Cheney Interlocking Wall Flashing is made in standard strips 42 in. long, which includes the 2-in. interlocking lap. It weighs about 16 oz. per sq. ft. Standard widths range from 4 to 36 in. Special strips of any width or design are made to order. Inside and outside corners can be furnished on all types. Interlocks without soldering. For complete details see drawings.

Type 1—Furnished in all widths up to 36 in. For use below the roof line, under cornices and window sills, and over lintels and spandrel beams by extending beyond inside face of wall 1 or 2 in. and bending up after mortar is set, so that water collecting on flashing cannot run into building. Far superior and less expensive than the usual copper pan under window sill, which must be bent up at each end of sill to exact dimensions and soldered at inside corners. Type 1 flashing is carried 4 in. beyond each end of sill and bent up against inside of wall after mortar is set. Water cannot climb across keys or accumulate at low point.

Type 2—For all standard walls. Used above roof line under copings and over Barrett Flashing Blocks. Furnished with ½-in. bends on each side to prevent capillary attraction.

Type 3—Furnished in all widths up to 32 in. For use above the roof line as a combined thru-wall flashing and 4-in. counterflashing. Comes ready for roofer to install standard metal base flashing or plastic base flashing underneath. Also for use through penthouse, chimney, skylight, party walls, and set back bases, by extending beyond inside face of wall 1 or 2 in. and bending up after mortar is set so that water collecting on flashing cannot run into the building. The keys on face of the 4-in. counterflashing materially strengthen the face, allowing it to be lifted and bent down again to hug the wall smoothly, which is not possible with plain sheet metal.

Type 4—For all standard walls. Used above roof line, under copings. Furnished with 4-in. counterflashing on one side and ½-in. turn-down on other to prevent capillary attraction. Recommended for all low parapet walls directly under coping stone.

Type 5—For 4-in. brick veneer walls as a counterflashing for piazza roofs, porch roofs, etc.

Type 6—For 4-in. brick veneer walls over window leaders and under sills and belt courses.

Type 7—For Waterproofing spandrel beams and at the same time bonding the 4-in. brick veneer to the spandrel beam fireproofing. Set in mortar as masonry progresses. No soldering necessary. Far superior to the ordinary plastic method, applied in advance of the brick laying, which usually dries out and blows off in sections before the bricklayers can cover it.

Type 8—All widths of walls up to and including 32 in. Identical in construction with Type 3 except that there is a ¼-in. flange turned up near the inside face of the wall, so that the moisture collecting on the top of the flashing cannot run to the outside of the wall, but must drain back to the roof. This ¼-in. flange embeds in the mortar joints without thickening the joint in any way.

Type 9—All widths up to and including 36 in. Identical in construction with Type 1, except that there is a ¼-in. flange turned up near the outside face of wall, so that the moisture collecting on the top of the flashing cannot run into the building, but must drain to the outside of wall. The ¼-in. flange does not thicken the joints.

Type 11—All widths up to and including 32 in. A combination thru-wall flashing with flange for locking to Cheney Vertical Ribbed Siding. Ideal construction where felt base flashing is used.

Type 33—For all standard fire walls. Carries entirely through the fire wall and turns down 4 in. on each side of wall as counterflashing.

Special Gable Type—All widths of walls up to and including 32 in. Identical in construction with Type 3, except that keys all slope towards roof, preventing water from running down outside of wall to stain and cause efflorescence. Specify right and left on this type, as reverse lap is used on one side of gable.

Special Cornice Type—Made to any dimension. Covers entire top of cornice and goes through wall. Takes care of expansion and contraction on the exposed surface. Usually made of lead coated copper to prevent staining of stone.

Special Type 3—Vertically keyed, is used as a base flashing in conjunction with standard Type 3 counterflashing for promenade tile roofs. One course of vertical tile conceals the flashing and is positively bonded to the masonry by the vertical keys of the base flashing.

Cheney Vertical Ribbed Siding—For lining the inside of parapet walls. The vertical keys strengthen the siding materially, take care of expansion and contraction, and provide air space insulation. This special siding is installed without soldering and has an extremely nice appearance.

Copper Wall Tie—Used as a wall tie in brick veneer construction. Ties the brick veneer in both directions and is inserted in the mortar joints about 6 ft. apart in every eighth course, staggered and nailed to the boarding.

CHENEY INTERLOCKING WALL FLASHING

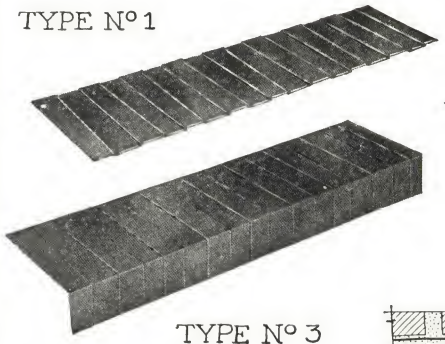
PATENTED MAY 28, 1929. SEPT. 24, 1929

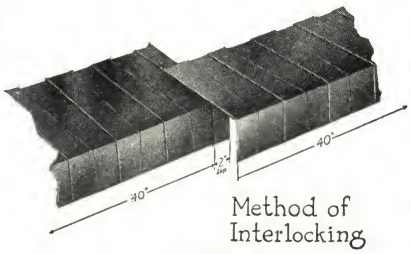
CHENEY

Reg. U. S. Pat. Off.

DETAILS SHOWING APPLICATIONS OF 'CHENEY' FLASHING

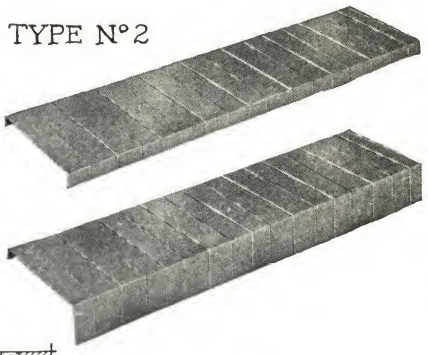
TYPE N° 1





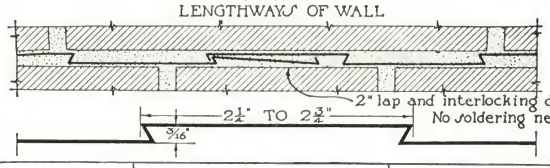
Method of Interlocking

TYPE N° 2

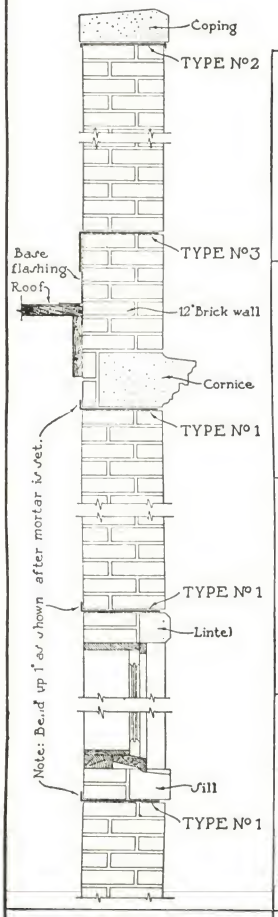


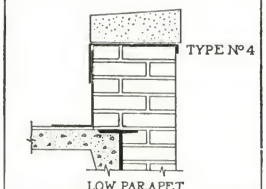
TYPE N° 3

SECTION LENGTHWAYS OF WALL

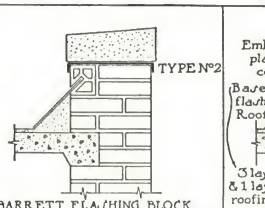


TYPE N°4

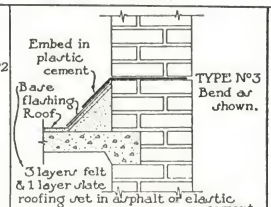


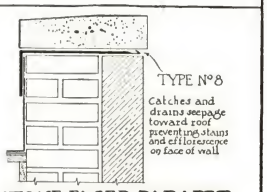


LOW PARAPET

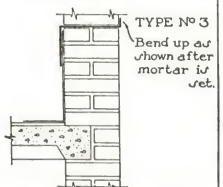


BARRETT FLASHING BLOCK

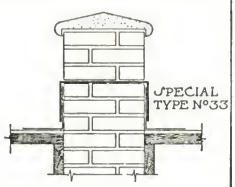




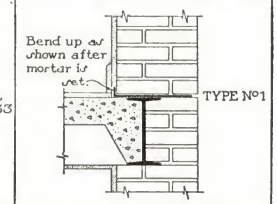
STONE FACED PARAPET

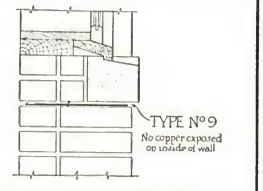


PENT HOUSE OR PARTY WALL

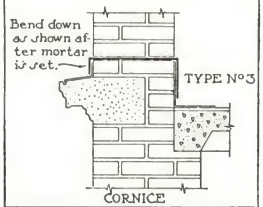


FIRE WALL

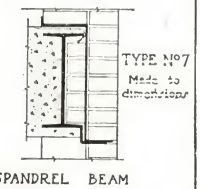




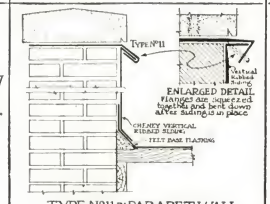
FLASHING FOR UNPLASTERED WALLS



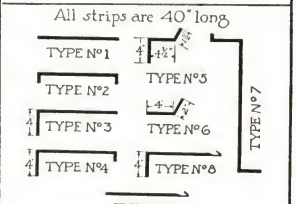
CORNICE

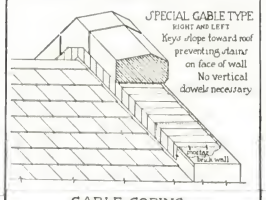


SPANDREL BEAM



TYPE N°11 IN PARAPET WALL





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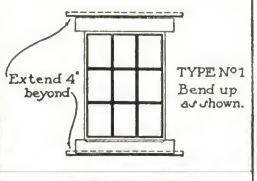
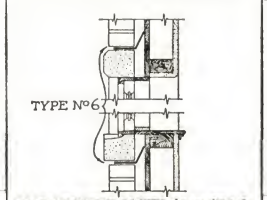
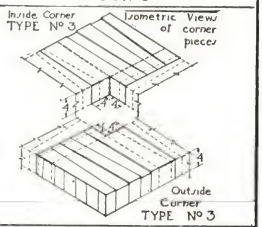
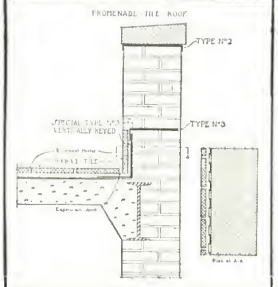


LINTELS AND SILLS

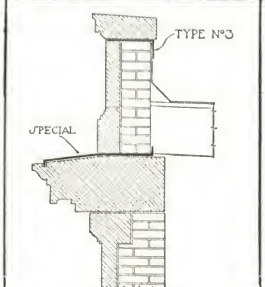


BRICK VENEER LINTELS AND SILLS

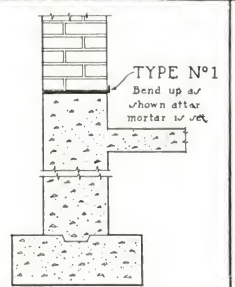




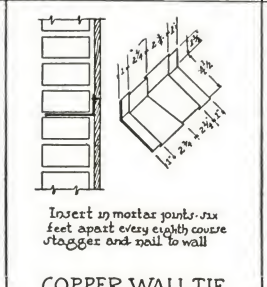
ONE COURSE OF TILE CONCEALS COPPER FLASHING WHICH COMPLETELY BONDS TILE FLASHING AND MASONRY



LIMESTONE CORNICE AND PARAPET

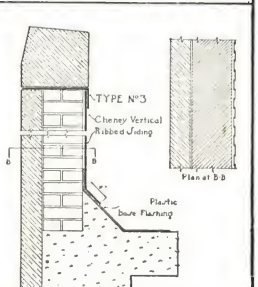


SEEPAGE STOP AT FOOTING



Insert in mortar joints six feet apart every eighth course stagger and nail to wall

COPPER WALL TIE FOR BRICK VENEER



VERTICAL RIBBED SIDING FOR PARAPETS

INTERLOCK FLASHING CORP.

TELEPHONE:
CHelsea 3-2400

308 West 20th Street
NEW YORK, N. Y.

INTERLOCK WALL FLASHING

"The Double-Lock, Perfect-Bond Wall Flashing"

"Interlock" Wall Flashing, with its double-lock feature, *absolutely eliminates seepage* through the masonry walls of buildings. It is installed during the construction of the wall and forms a *perfect mechanical* bond in the mortar bed. It requires no soldering. "Interlock" Wall Flashing is regularly made of 16 oz. soft copper. It can also be furnished in lead coated copper, Hoyt hard lead and other metals. Where desired "Interlock" flashing can be made in any metal to specifications.

TYPES, SIZES AND USES

All strips are made 44 in. long, including 3-in. double interlocking lock—net coverage of strip being 41 in. Height 3/16 in. Supplied in the widths indicated and for the various purposes listed below.

Type "A"

Supplied in any width up to 36 in. For use below the roof line, under window sills and cornices. Can also be used over lintels and spandrel beams simply by extending one or two inches beyond the inside face of wall and bending up after mortar is set. When used under sills, flashing is extended four inches on each end of sill and then bent up after mortar is set.

Type "B"

Supplied for any standard wall. ½-in. bend on each side prevents capillary attraction. For use above the roof line under copings and with flashing blocks.

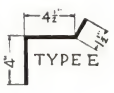
Type "C"

Supplied with 4-in. counterflashing for all widths of wall up to 32 in. Used above the roof line as a combined through wall flashing and counterflashing. When so used a plastic base flashing or standard metal base flashing is installed underneath the "Interlock" flashing.

Type "D"

Supplied with 4-in. counterflashing for any standard wall. ½-in. bend on other end prevents capillary attraction. Used on parapet walls directly under coping stone.

Type "E"

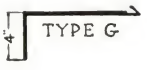


Supplied for 4-in. brick veneer walls. To be used as a counterflashing for porch and balcony roofs.

Type "F"

Supplied for 4-in. brick veneer walls. To be used under window sills, and over window headers and belt courses.

Type "G"



Supplied for any width of wall up to 32 in. Construction the same as type "C" except for ¼ in. flange turned up near inside face of wall.

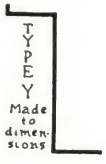
Type "H"

Supplied in any width up to 36 in. Construction the same as type "A" except ¼-in. flange turned up near outside face of wall. Flange prevents accumulated moisture from running into building and drains to the roof. Size of mortar joint is not increased by flange.

Type "J"

Furnished for any standard firewall. Carries through the wall and acts as counterflashing. Turned down 4 in. on each side of wall.

Type "Y"



Can be used for waterproofing spandrel beams and at the same time maintains a bond between the 4-in. brick veneer and the spandrel beam fireproofing. Made to dimensions.

SPECIAL TYPES

Gable Type

Regular type "C". Supplied (right and left hand) for all widths of wall up to 32 in. Drains water to roof preventing stains and efflorescence on outside of wall.

Cornice Type

Generally furnished in lead coated copper to eliminate staining of stone. Made to dimensions. Goes through wall and covers entire top of cornice. Provides for expansion and contraction of exposed surface.

Special Type "C"

For promenade tile roofs. Used as a base flashing together with regular type "C" counterflashing. *Vertical keys* assure perfect mechanical bond in the masonry. Flashing is covered with one course of vertical tile.

Interlock Ribbed Siding

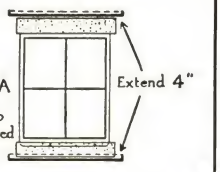
Used as inside lining for parapet walls. *Vertical keys* add considerable strength to siding, provide air space insulation and take care of expansion and contraction.

Interlock Copper Wall Tie

Used in brick veneer construction as a wall tie. Inserted every eighth course in mortar joints about 6 ft. apart, staggered and nailed to boarding. Serves to tie veneer in both directions.

SPECIFICATION

All Through-Wall Flashing and Counterflashing shall be of the proper type and size and shall be Interlock Wall Flashing as manufactured by Interlock Flashing Corp. of New York. All Flashing shall be placed in wall by Mason Contractor with mortar on top and below so that perfect mechanical bond is obtained. Flashing shall be furnished by Sheet Metal Contractor, who shall be responsible for proper installation.

1


LINTELS and SILLS

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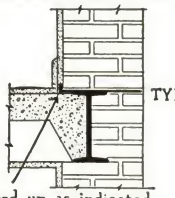

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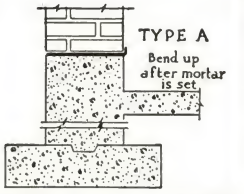

SEEPAGE STOP at FOOTING

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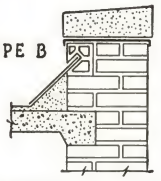

BARRETT FLASHING BLOCK

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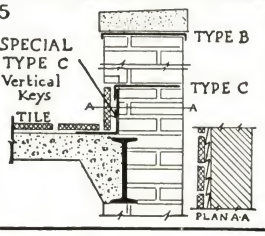

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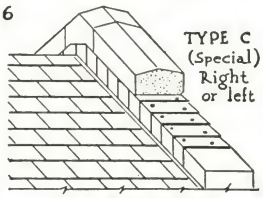

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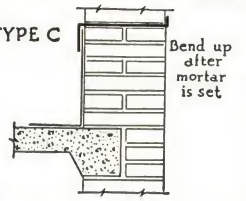

PENT HOUSE or PARTY WALL

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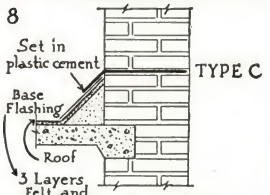

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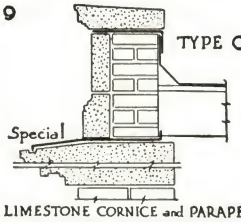

LIMESTONE CORNICE and PARAPET

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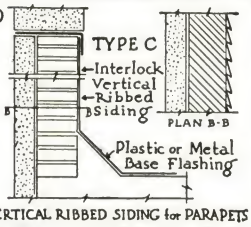

VERTICAL RIBBED SIDING for PARAPETS

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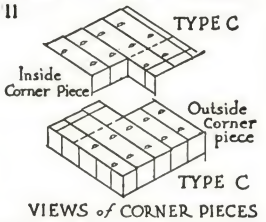

VIEWS of CORNER PIECES

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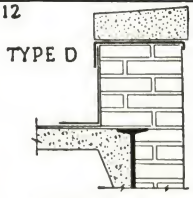

LOW PARAPET

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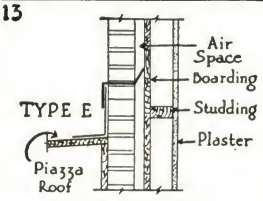

BRICK VENEER

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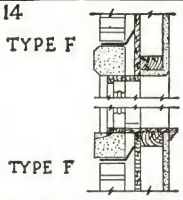

BRICK VENEER LINTELS and SILLS

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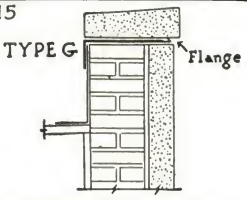

STONE FACED PARAPET

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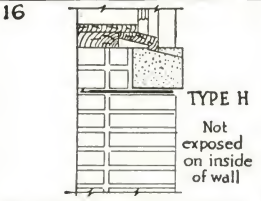

For UNPLASTERED WALLS

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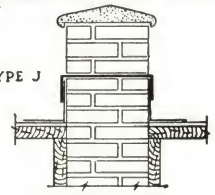

FIRE WALL

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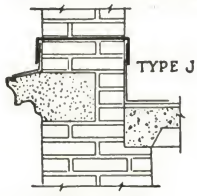

CORNICE

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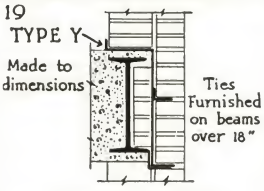

SPANDREL BEAM

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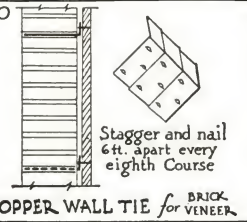
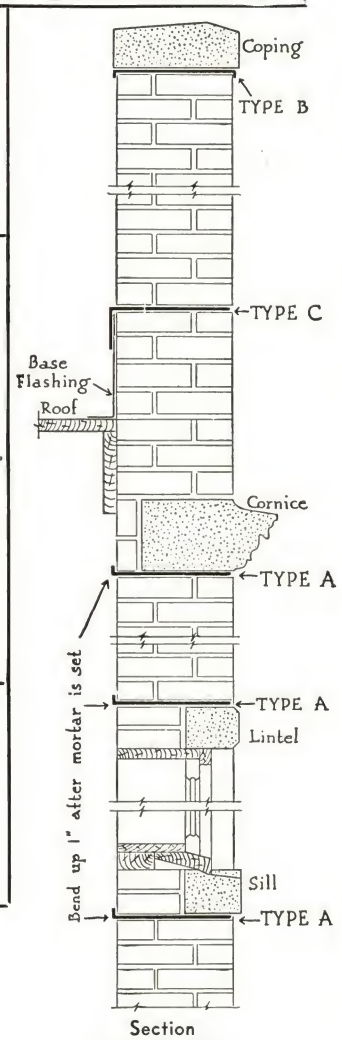
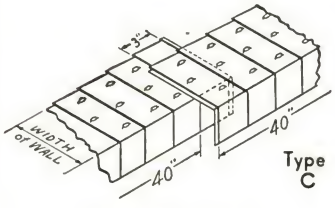


COPPER WALL TIE for BRICK VENEER

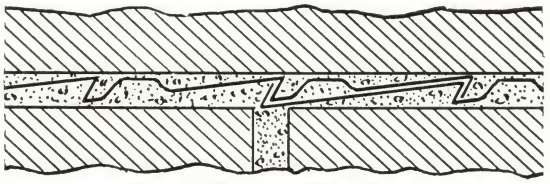


Section Through Wall

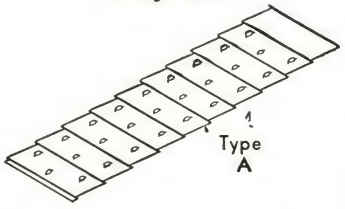
Some of the many Flashing Requirements for which INTERLOCK WALL FLASHING is designed



Showing Method of Interlocking


Section Through Mortar Joint
Double-Lock

One-half Actual Size



APPLICATIONS OF *INTERLOCK* WALL FLASHING

THE FIGGE COMPANY

Manufacturers of the Patented Figge Roof Flashing

1617 North Hoyne Avenue, CHICAGO, ILL.

For Figge Wall Gaskets, see Manufacturers' Index

Figge Roof Flashing

Figge Roof Flashing eliminates 95% of roof leaks. It is applied by all leading roofing contractors.

Write for literature, specifications and prices on our Standard and Extra Heavy Types.

List of installations and samples furnished on request.

Materials Used

Figge Roof Flashing is made from suitable heavy woven cotton fabrics, thoroughly saturated and coated with a hot bituminous compound; and is furnished from stock in the following sizes:

Standard Type—
2-ply—8, 10 and 12 in. wide; 3-ply—8, 10 and 12 in. wide.

Extra Heavy Types—
1-ply—8, 10 and 12 in. wide; 2-ply—8, 10 and 12 in. wide.
Other sizes to order.

Specifications for Figge Built-up Roof Flashing

Standard Types

Coal Tar Pitch and Gravel Roofing, Asphalt Asbestos Felt Roofing, and Asphalt Rag Felt Roofing.

Roof Flashings—
The Roof Flashing shall be one-ply Extra Heavy type Figge Flashing applied in accordance with manufacturer's specifications. The flashing shall be at least 10 in. wide and must be carried 2 in. over the roof deck and 6 in. up the vertical surfaces or as otherwise shown on plans.

Extra Heavy Types

Coal Tar Pitch and Gravel Roofing, Asphalt Asbestos Felt Roofing, Asphalt Rag Felt Roofing.

Roof Flashings—
The Roof Flashing shall be two-ply Extra Heavy type Figge Flashing applied in accordance with manufacturer's specifications. The flashing shall be at least 10 in. wide and must be carried 2 in. over the roof deck and 6 in. up the vertical surfaces or as otherwise shown on plans.

Raggle in Walls

Raggle in brick, hollow tile and concrete walls must be provided approximately ½ in. wide and 1½ in. deep.

Add to specifications under "Masonry"—Raggle for Roof Flashing: Raggles for roof flashing shall be provided in accordance with instructions furnished by roofing contractor.

Manufacturer's Specifications

Consult specifications of various roofing manufacturers for recommended use of Figge Roof Flashing in connection with bonded and unbonded roofs.

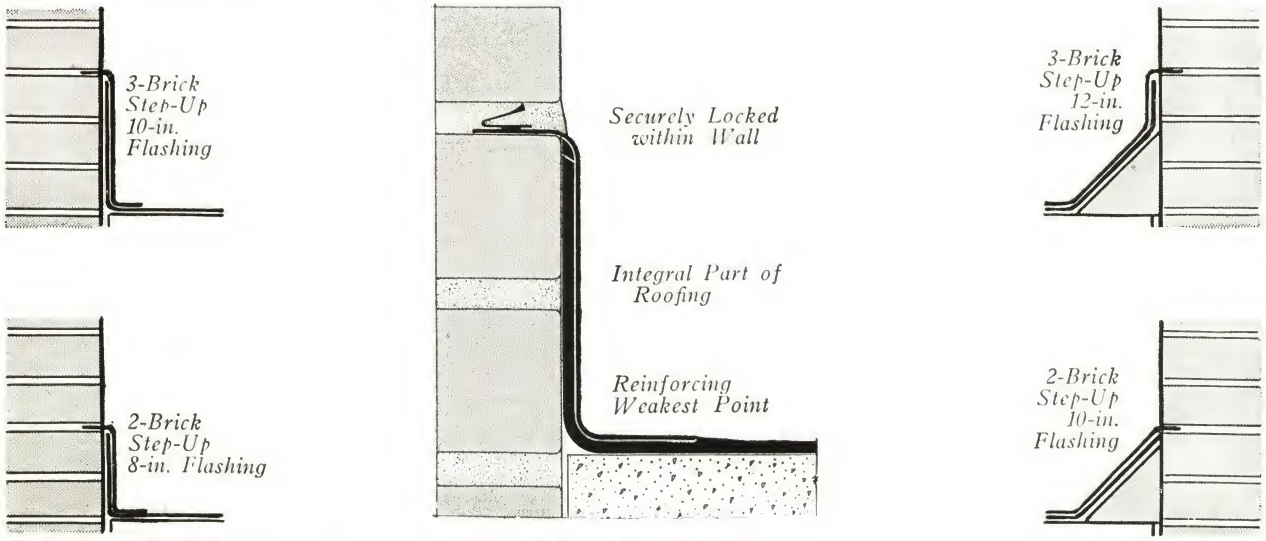
Figge Roof Flashing Simple to Apply

No special construction needed; provide raggle by raking mortar out of joint or insert wood strip in wall or form.

Securing device of non-corrosive metal carries flashing into wall, locking it securely.

Roofing is turned up the wall, as usual, flashing turned down over it and mopped to walls and between layers.

Raggle pointed-up and mopped.



Typical Application No Cantstrip

Detail of Figge Flashing Showing Its Advantages

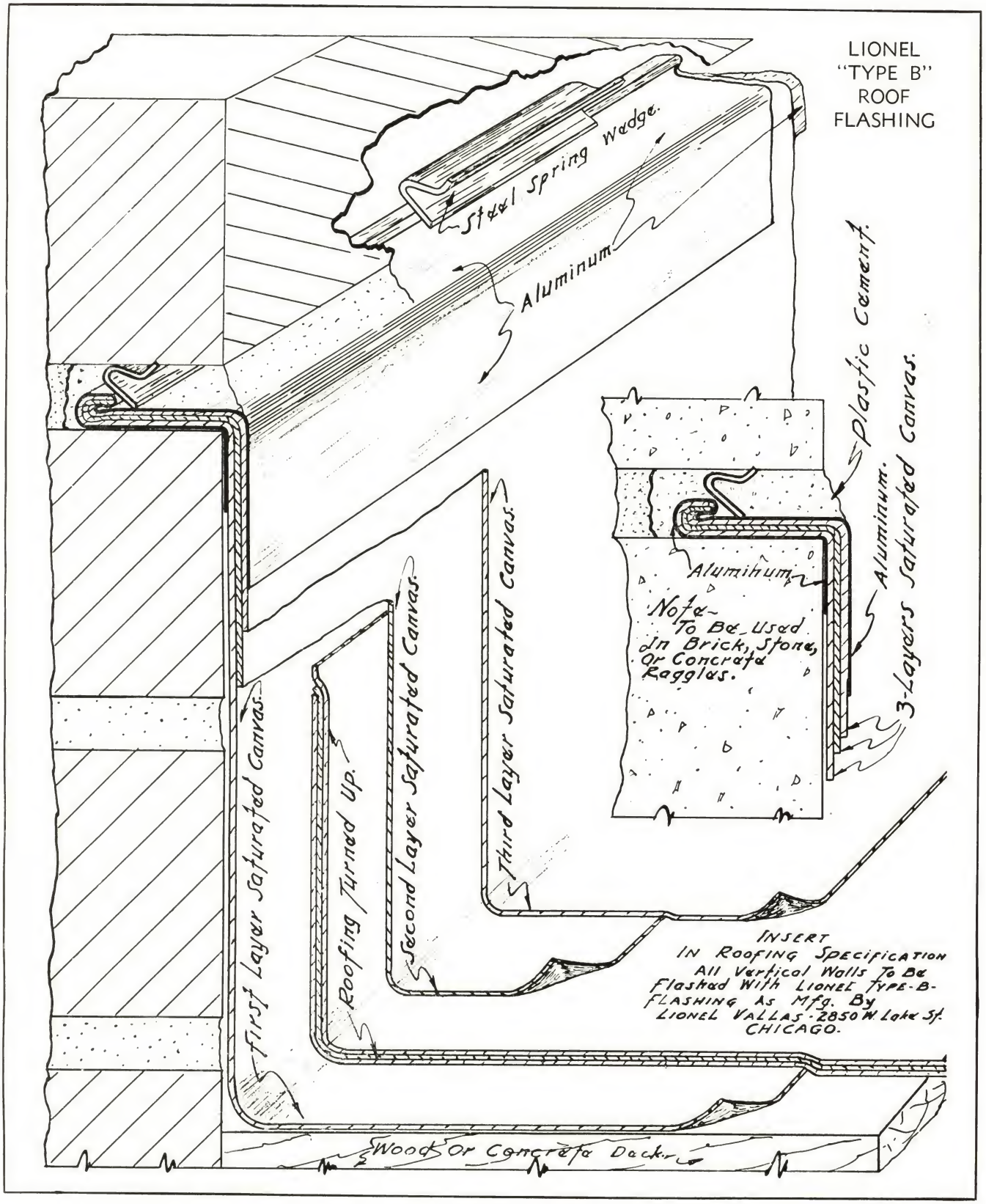
Typical Application Over Cantstrip

LIONEL VALLAS

Manufacturers of Sheet Metal Products

2846-50 West Lake Street, CHICAGO, ILL.

See Manufacturers' Index for our Hollow Metal Windows and Doors, Skylights and Ventilators



THE AMERICAN BRASS COMPANY

Manufacturers of Sheet, Roll and Strip Copper

GENERAL OFFICES

WATERBURY, CONNECTICUT

MANUFACTURING PLANTS

ANSONIA, CONN. TORRINGTON, CONN. WATERBURY, CONN. BUFFALO, N. Y. DETROIT, MICH. KENOSHA, WIS.

CANADIAN MILL: Anaconda American Brass Limited, NEW TORONTO, ONT.

OFFICES AND AGENCIES

NEW YORK, N. Y., 25 Broadway
NEWARK, N. J., Military Park Building
BOSTON, MASS., One Forty Federal Street
PROVIDENCE, R. I., 131 Dorrance Street
PHILADELPHIA, PA., Architects Building
WASHINGTON, D. C., 810 18th Street
ATLANTA, GA., The Healey Building
PITTSBURGH, PA., Oliver Building
CLEVELAND, OHIO, Union Trust Building
CINCINNATI, OHIO, Chamber of Commerce Building
DAYTON, OHIO, Third National Building
CHICAGO, ILL., 1326 W. Washington Blvd.
ST. LOUIS, MO., Cotton Belt Building
HOUSTON, TEX., Post-Dispatch Building
SAN FRANCISCO, CAL., Russ Building

Products

ANACONDA SHEET COPPER, ROLL COPPER and ECONOMY STRIP COPPER.

For pages on Anaconda Architectural Extruded Shapes and Drawn Shapes, Brass and Copper Pipe and Deoxidized Copper Water Tube and Everdur Metal, see Manufacturers' Index.

Sheet Copper

Because of the durability of copper, this metal is extensively used for all types of exposed sheet metal work. Copper is practically immune to deterioration by atmospheric corrosion, with the result that painting and other forms of maintenance are unnecessary. Copper, on exposure, protects itself by the formation of a tightly adherent patina which is insoluble in water. The high humidity found along seacoasts and in river valleys does not cause disintegration.

The accurate reproduction of architectural designs is possible in copper because of the metal's ready workability. Its linear coefficient of expansion, .00000887 inches per degree Fahrenheit, is the least of the nonferrous metals. Anaconda Sheet Copper is uniform in quality, weight and temper and is guaranteed 99.9% pure.

Copper Spandrels

The growing use of metal spandrels widens the field of application for copper in building construction. Anaconda Sheet Copper, either lead-coated or plain, may be stamped and formed in a wide variety of designs suitable for most types of buildings. Sheet Copper Spandrels can be backed by an insulating material, becoming an integral part of a building's construction, or used uninsulated on the face of rough masonry in the manner of applied ornamentation.

Cold-rolled and annealed 20-oz. copper sheets assure sufficient rigidity in spandrels. In some cases 16-oz. copper is satisfactory.

Lead-coated Anaconda Copper

Anaconda Sheet Copper is furnished lead-coated in standard weights and sizes. The same textures can be obtained in lead-coated copper as in solid lead, at a saving in weight and cost.

Roofing Copper

Sheet Copper is widely used for the standing and batten-seam type of metal roofing. 16-oz. sheets, 24x96, 30x96 and 36x96 ins. are regularly furnished for roofing.

In tile form, Sheet Copper weighs even less than wood shingles and does not require heavy roof framing. A number of manufacturers supply copper tile in plain and ornamental designs, with interlocking features that assure watertight joints, ready application and proper allowance for expansion and contraction.

Copper Flashing

The durability of copper makes it an ideal material for flashings. All copper flashings should be made of soft (roofing temper) Sheet Copper, which is easily worked and shaped, and stands up well under temperature stresses. The height of flashings is determined by climatic conditions. In localities where snow accumulates at adjoining roof surfaces, higher flashings are necessary than in localities where conditions are less severe. Flashings 4 to 6 ins. in height are generally ample.

Cornices

Hard (cornice temper) copper readily lends itself to the execution of cornice designs. When ready-made copper cornices are adaptable to architectural requirements, they are obtainable in a wide range of designs from leading fabricators.

Economy Strip Copper

Anaconda Economy Strip Copper (trade-mark Reg. U. S. Pat. Off.), was developed by THE AMERICAN BRASS COMPANY to minimize waste and to eliminate the labor cost of flattening, cutting and trimming standard sheets in the fabrication of gutters, rain pipes, flashings, etc.

Every strip bears the Anaconda trade-mark stamped in the metal.

Stock Gutters and Leaders

Arrangements have been made with a number of leading sheet metal manufacturers, whereby gutters and leaders made of Anaconda Copper, with the trade-mark embossed in the metal, are available in all sections of the country.

It is often desirable to have gutters, leader heads and leaders of plain or lead-coated copper made to special design. These can be made up by contractors specializing in this type of work.

Anaconda Distribution Is Nationwide

Distributers maintaining stocks of Anaconda Copper are located in important cities from coast to coast. Large stocks of Anaconda Copper Sheets, Rolls and Economy Strips at Ansonia, Conn.; Buffalo, N. Y.; Detroit, Mich.; and Kenosha, Wis., enable distributers to meet any unusual requirement on short notice.

THE AMERICAN ROLLING MILL COMPANY

Member of The Producers' Council

Makers of Ingot Iron Sheets and Plates and Special Analysis, Special Finish Steel Sheets

EXECUTIVE OFFICES
MIDDLETOWN, OHIO

DISTRICT OFFICES

NEW YORK, N. Y., 50 Church Street
CHICAGO, ILL., 1122 Strauss Building
PHILADELPHIA, PA., 2020 Lewis Tower
ST. LOUIS, MO., 1724 Ambassador Building
DETROIT, MICH., 5-261 General Motors Building
CINCINNATI, OHIO, 1007 Chamber of Commerce Building
PITTSBURGH, PA., 1632 Oliver Building
SAN FRANCISCO, CAL., 540 Tenth Street
CLEVELAND, OHIO, 1516 B. F. Keith Building

Distributers in principal cities can supply contractors' requirements promptly

Armco Products

INGOT IRON and STEEL SHEETS: Galvanized (flat and corrugated), Hot Rolled and Annealed, and Furniture grades.

INGOT IRON and STEEL PLATES: Annealed.

ROOFING (Galvanized Ingot Iron and Steel): Roll, V-Crimp, Standing Seam, Pressed Standing Seam, Corrugated; Spanish Metal Tile—made and sold by the Milcor Steel Co., Milwaukee, Wis.; and Glasiron (Porcelain Enameled on Ingot Iron) Tile, made and sold by Wolverine Porcelain Enameling Co., Detroit, Mich.

Manufactured Building Products Made of Armco Sheets: Gutters, Down-spouts, and other Roof and Roof Drainage Fittings, are carried in stock by Armco Distributers throughout the country and contractors can obtain supplies promptly. Porcelain Enameled Roof Shingles are made and sold by the Wolverine Porcelain Enameling Co., Detroit, Mich. Metal Lath and Fittings are made and sold by The Milcor Steel Co., of Milwaukee, Wis., and the Truscon Steel Co., Youngstown, Ohio.

Welding Rods and Electrodes, and Chain Link Fence of Ingot Iron are made and distributed by Page Steel & Wire Co., Pittsburgh, Pa. For the schoolroom, Metal Blackboards of Ingot Iron, ("Metalboard") porcelain enameled in attractive colors, are made and distributed by the American Seating Co., Chicago, Ill.

Ingot Iron Resists Rust

Like the old-fashioned irons of long ago, Ingot Iron owes its rust-resistance to refinement and uniform physical structure. Foreign elements that cause rust have been reduced to a small fraction of one per cent, leaving a uniform and dense structure that is a formidable barrier against the inroads of rust. Ingot Iron was the first refined iron ever to be made by the open hearth process, and was developed especially to resist rust. Galvanized Ingot Iron sheets have the additional protection of a heavy coating of high grade zinc, insuring the utmost durability possible to provide in galvanized sheet metal.

Ingot Iron Makes Sound Welds

Another advantage of the refinement of Ingot Iron is its excellent welding properties. It melts evenly under welding temperature and makes a sound, flawless weld that is as strong and rust-resistant as the surrounding area.

More Workable

Again, the uniformity of Ingot Iron makes it especially soft and workable, free from irregular hard spots that interfere with accurate forming of intricate designs. Also, the special attention given to Ingot Iron throughout manufacturing operations insures freedom from the strains and stresses that frequently cause sheets to crack or split when formed sharply.

Saves Money for Owners

On a cost-per-year basis, Ingot Iron has proved its ability to save money for its owners. This evidence is found in the records of a quarter century of satisfactory service—the longest record of *actual service* of any low-cost, rust-resisting sheets or plates.

Data on the service of Ingot Iron taken from actual installation records are available to help determine the probable life and yearly cost in specific new projects. Almost always this information can be selected from the particular industry or conditions of service in which you are interested, and frequently comparative records are also available to show how other grades of sheet metal have served under identical conditions.

How to Identify Ingot Iron

The Armco Triangle with the words, "Ingot Iron," stenciled in blue on every sheet, is definite protection against substitution of inferior grades or lighter gages. In each instance the gage is shown at the right of the triangle. All Ingot Iron construction should reveal at least a portion of the blue triangle as shown at the left; for it is placed three times diagonally lengthwise on the sheet. If Ingot Iron has been specified and no part of the triangle is in evidence, either inside or outside, it is certain that the specifications have not been followed.

Standard Gages and Sizes

Ingot Iron galvanized sheets are carried in stock in the following sizes: Gages—16, 18, 20, 22, 24, 26, and 28. Widths—24, 26, 28, 30, and 36 ins. Lengths—96 and 120 ins.

Ingot Iron corrugated, galvanized and black sheets for roofing and siding purposes are made with 5, 3, 2½ and 1¼-in. corrugations. For general building purposes we recommend and carry in stock a 2½-in. corrugated sheet, 26 ins. wide (after corrugating) for siding, and 27½ ins. wide (after corrugating) for roofing. This size covers 24 ins. in the width and allows for a one-corrugation lap for siding and a one-and-one-half-corrugation lap for roofing. These sheets may be obtained from stock in the following sizes: Gages—20, 22, 24, 26, 28. Widths—26 and 27½ ins. Lengths—60, 72, 84, 96, 108, 120, 144 ins.

All of the above sizes are termed standard sizes because they are carried in stock and used most frequently. All grades of sheets may be obtained in special sizes when an order is placed for 2000 lbs. or more of a size.

Ingot Iron Plates

Particularly suitable for the fabrication of tanks, stacks, breeching, etc. Complete data on any specific project of this nature will gladly be supplied. "Pure Iron Plates for Long Service" also contains useful information about this product. At your request, a copy will be sent.

Where to Get Armco Sheets and Formed Products

Leading distributers and sheet metal contractors in all parts of the United States and Canada supply galvanized sheets and galvanized formed products, and in some instances, annealed and hot rolled sheets and plates. Names and addresses of distributers and shops in any given territory will be supplied on request.

Every Architect Should Have This Literature

"Galvanized Iron for Roofs and Roof Drainage," and "Galvanized Iron for Cornices, Marquises and Skylights" are two useful handbooks devoted to everyday problems in these two important phases of building construction. Both are replete with working data, references, detail drawings, tables, scales, nomenclature, and other essential information for architects and engineers. These books were prepared in collaboration with competent firms of architects and engineers and reviewed by the Structural Service Bureau at the A. I. A.

Other informative publications are the bulletins: "Cooling and Ventilating the New Minneapolis Auditorium," "Ventilating the General Science Building of Antioch College," "Colored Porcelain Enameled Blackboards," "Providing Healthful Air for the Columbus Gallery of Fine Arts," and "Design and Function of an Air Conditioning System for a Modern Residence." Other numbers of this series will follow.

BERGER BROTHERS COMPANY

Gutter Hangers and Conductor Pipe Fasteners

229-237 Arch Street, PHILADELPHIA, PA.

See Display in the Architects' Exhibit at Indianapolis, Ind.

Products

GUTTER HANGERS and CONDUCTOR PIPE FASTENERS, of malleable iron, wrought iron, solid cast bronze and copper channel.

Also a general line of Sheet Metal Workers' Requirements; "Shurlock" Conductor Pipe and "E-Z" Fit Eaves Trough; "Quaker City" lines of Mitres, Ends, Caps and Outlets.

Manufacturers of Octagon and Polygon Conductor Pipe; "Rival" Eaves Trough Strap Hanger.

TRADE -B B- MARK

Our registered trade-mark appears on all products manufactured by us. This mark represents dependability, durability and strength and protects the purchaser against inferior imitations.

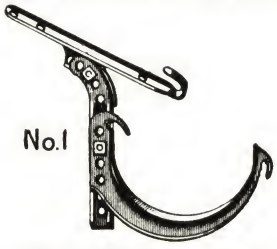
When specifying, full protection is assured by insisting that our trade-mark appear on every piece.

The Mark of Quality Which Protects the Purchaser

We are the originators, designers and manufacturers of, we believe, the best grade of gutter hangers and conductor pipe fasteners on the market.

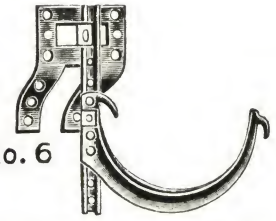
How Furnished—Made of malleable and wrought iron, plain or tinned (plain furnished unless otherwise specified), solid cast bronze and copper channel. All shanks and circles interchangeable. One bolt included with each hinged shank. Hinged shanks are adjustable to any pitch of roof. Shanks may be lengthened with our extension shanks.

Free samples on request.

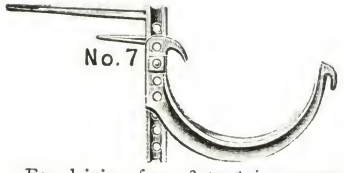


Clamped direct to metal roof, requiring only one bolt through the iron. Especially suitable for awnings and corrugated roofs

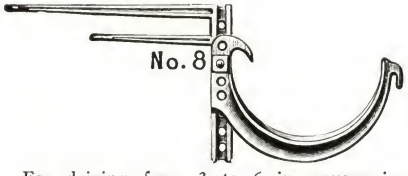
Will span over various shaped mouldings and is easily bent larger or smaller before nailing to eave



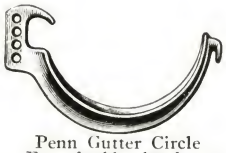
For nailing against O. G. mouldings. The two stays are made to fit in the cove and can be bent to suit variation



For driving from 3 to 4 in. square in cornice. Lower prong forms a brace for the upper and makes it strong and firm



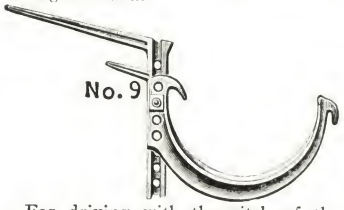
For driving from 3 to 6 in. square in cornice. Intended for eaves where shingles project over the cornice



Penn Gutter Circle
For double bead gutters. Sizes, 3½, 4, 4½, 5, 6, 7 and 8 in.

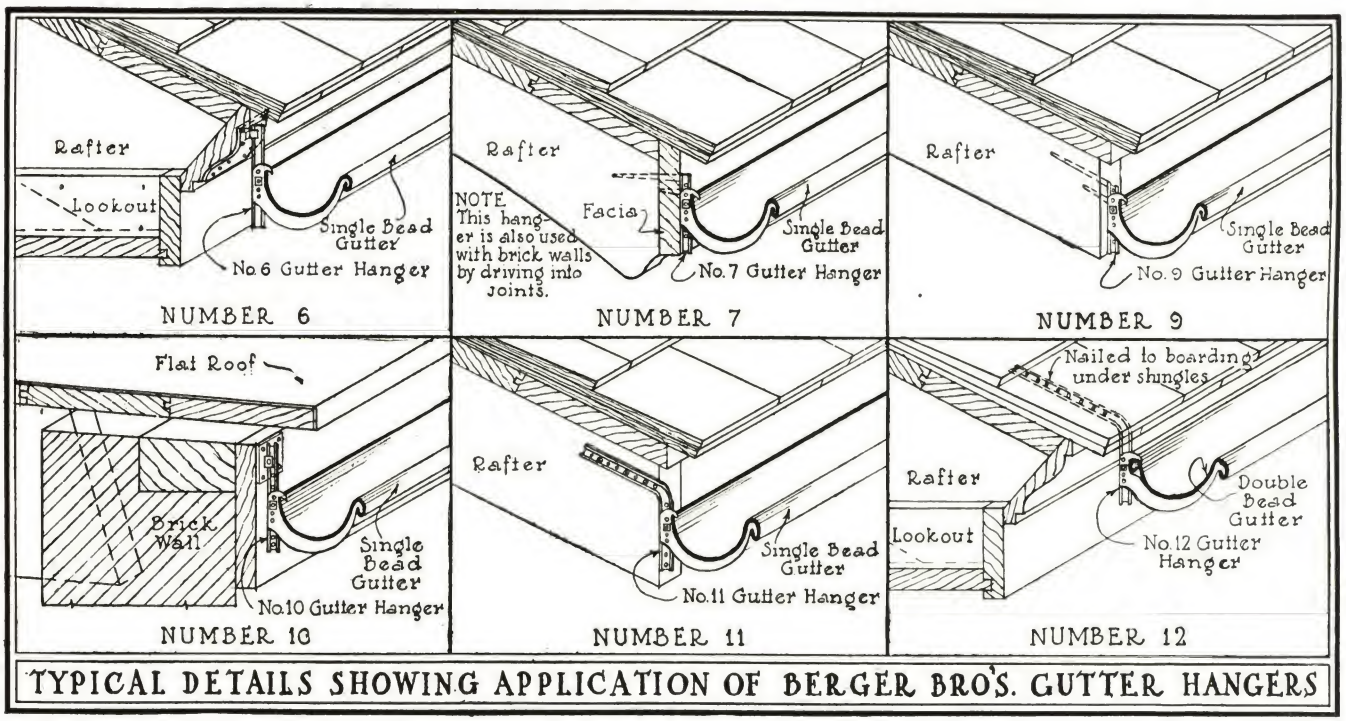
Gem Gutter Circle
For single bead gutters. Sizes, 3½, 3¾, 4, 4½, 5, 6, 7 and 8 in.

Circles are applicable to any B. B. hanger

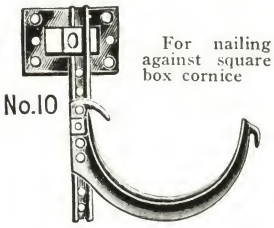


For driving with the pitch of the roof. Suitable for narrow moulded cornice

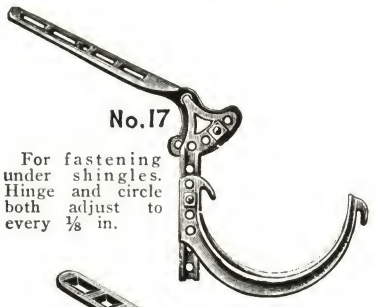
B. B. Gutter Hangers



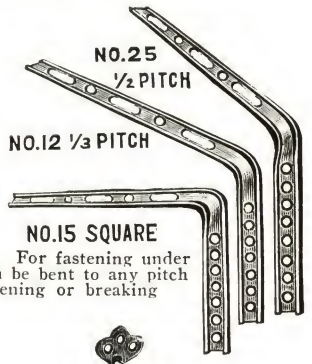
TYPICAL DETAILS SHOWING APPLICATION OF BERGER BRO'S. GUTTER HANGERS



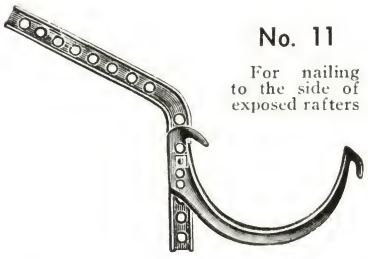
For nailing against square box cornice



For fastening under shingles. Hinge and circle both adjust to every ⅛ in.



Nos. 12, 15 and 25. For fastening under shingles or slate. Can be bent to any pitch of roof without weakening or breaking



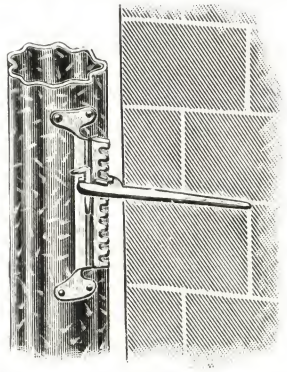
For nailing to the side of exposed rafters

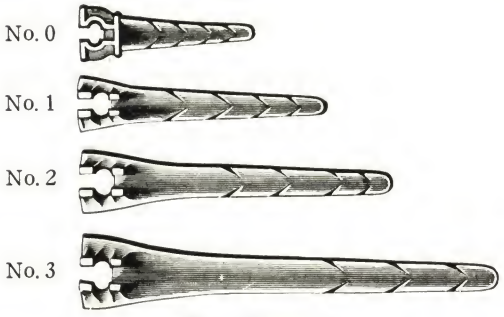
For fastening under shingles

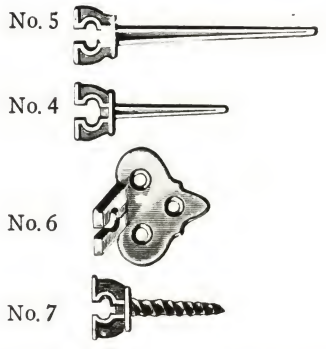
For nailing or screwing to shaped mouldings at any angle desired. Hinged for any pitch of roof

B. B. Gutter Hangers

Made of malleable and wrought iron, plain or tinned (plain furnished unless otherwise specified), solid cast bronze and copper channel. All shanks and circles interchangeable. One bolt included with each hinged shank. Hinged shanks are adjustable to any pitch of roof. Shanks may be lengthened with our extension shanks. Free samples on request



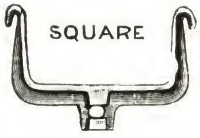


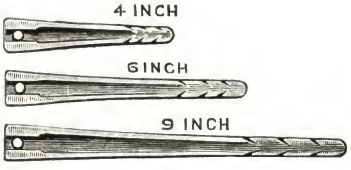


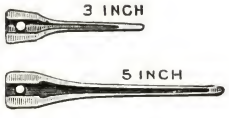
Pipe Fasteners

For fastening all kinds of conductor pipes at any distance from the wall. Used in any position and allow enough variation to let pipe slip together until tight in the joints. Needs no close measuring on wall to find a joint for the drive

No. 0. For brick, 3 in. No. 1. For brick or stone, 4½ in. No. 2. For stone, 6 in. No. 3. For stone, 9 in. No. 4. For wood, 3 in.
No. 5. For wood, 5 in. No. 6. To nail on wood. No. 7. To screw in wood.



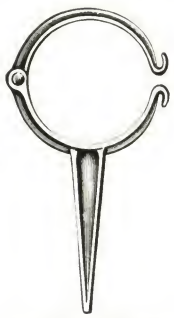




Clasp Pipe Hooks

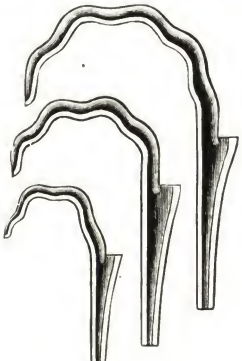
For fastening conductor pipe to wood, brick or stone at any distance from the wall. Length drives: 3 and 5 in. for wood; 4, 6 and 9 in. for brick and stone

Round Corrugated Hinged Pipe Hook
With wood and brick drive. Sizes, 2, 3, 4, 5 and 6 in.



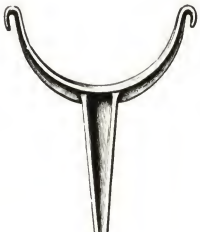
Plain Round Hinged Pipe Hook
With brick drive in 2, 3, and 4 in., and wood drive in 2, 3 and 4-in. sizes.

Plain Sickle Pipe Hooks
With wood and brick drive. Sizes, 2, 3, 4, 5 and 6 in.



Corrugated Sickle Pipe Hooks
With wood and brick drive. Sizes, 2, 3 and 4 in.

Square Wired Pipe Hook
With wood and brick drive. Sizes, 3, 4, 5 and 6 in.



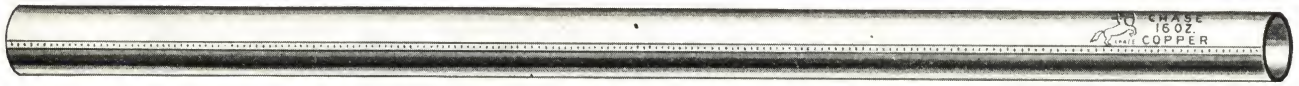
Round Wired Pipe Hook
With wood drive. Sizes, 3 and 4 in.

B. B. Conductor Pipe Fasteners and Hooks of Tinned Malleable Iron and of Solid Cast Bronze

CHASE COPPER ROOFING MATERIALS, DRAWN BRASS DOOR SADDLES AND SILL MOULDINGS

CHASE BRASS & COPPER CO.
—INCORPORATED—
WATERBURY, CONN.

NEW YORK, N. Y., 80 Lafayette Street
BOSTON, MASS., 411 "D" Street
BUFFALO, N. Y., 25 Ellicott Street
NEWARK, N. J., 361 Halsey Street
PHILADELPHIA, PA., 46 No. 6th Street
BALTIMORE, MD., 307 E. Lombard Street
PITTSBURGH, PA., 855 North Avenue, West
CINCINNATI, OHIO, 222 Post Square
CLEVELAND, OHIO, 5005 Superior Avenue
DETROIT, MICH., 2798 E. Grand Boulevard
CHICAGO, ILL., 1300 W. Harrison Street
MILWAUKEE, WIS., 512 North Water Street
MINNEAPOLIS, MINN., 145 No. 10th Street
ST. LOUIS, MO., 314 No. 2nd Street
NEW ORLEANS, LA., 429 Camp Street
DALLAS, TEX., 1407 Main Street
LOS ANGELES, CAL., 210 Central Avenue
SAN FRANCISCO, CAL., 680 Second Street
OAKLAND, CAL., 1808 Peralta Street
SEATTLE, WASH., 1957 First Avenue, So.



Products

COPPER DOWNSPOUTS, ELBOWS, SHOES, STRAPS, STRAINERS, HEADS.

COPPER GUTTERS: MITERS, END PIECES, CAPS, OUTLETS and HANGERS.

SHEET COPPER; COPPER NAILS; COPPER SHINGLES.

DRAWN BRASS DOOR SADDLES and SILL MOULDING.

Also, Snow Guards; Copper Ridge Caps, Rolls, Valleys and Flashings; Brass and Bronze Railings; Grilles; Ornamental Wire Work.

For Chase pages on Bronze and Copper Screen Cloth, Brass and Copper Pipe, and Copper Water Tubing, see Manufacturers' Index.

Thickness of Copper for Exposed Work

For exposed sheet metal work, 16 oz. to the square foot is the lightest weight copper that will give satisfactory service. Based on this premise which has been carefully checked by eminent authorities over long periods of time and under varying conditions of actual service, Chase Standard Copper Roofing Accessories are made only of full 16-oz. copper sheet. Heavier weights can be furnished to special order but we do not advocate nor make anything *lighter* than 16 oz.

As our guarantee of full weight and also to facilitate inspection of a completed installation, we indelibly die-stamp every length of our downspouts and gutters, "Chase 16 Oz. Copper."

Special Designs

It is entirely feasible for an architect to design his own downspouts, gutters, heads and straps, and we are in a position to supply these commodities to special order in practically any pattern.

But in order to keep expenses down, stock shapes are usually specified for private dwellings and in many instances for public buildings and institutions.

Lead Coated Sheets and Accessories

Lead coating on copper does three things—it provides a neutral gray coloring that is very desirable on many types of buildings; it increases resistance to attack from gases in the air and other ravages of the elements; and it prevents staining of copings and sidewalls from copper salts that in some cases wash off plain copper in wet weather.

We can furnish lead coated flat sheet and strip copper in a wide range of sizes and a variety of finishes, some of which are exclusive with us. We can also supply any of our stock roofing accessories, such as downspouts, gutters, heads, etc., with a lead coating.

In this connection, the advantages of lead coated copper downspout heads deserve special consideration. Lead coated copper is less expensive than solid cast lead; yet in color, a lead coated copper downspout head will match solid lead perfectly. It has the further advantage of lightness in weight which means less expense for installation and easier provision for its support.

Stock Downspouts

There are three types and five sizes of Chase Copper Downspouts available for immediate shipment from our warehouse stocks: Plain round, corrugated round and corrugated *square. All of these types, except corrugated square which runs only to 5 in., are carried in 2, 3, 4, 5 and 6-in. diameters, in 10-ft. exact lengths.

*From long custom this type of downspout is called "square," whereas in reality it is rectangular in shape. The actual measurements of *2-in.* "square" copper downspouts are 1¾x2¼-in.; *3-in.*, 2⅝x3¼-in.; *4-in.*, 2¾x4¼-in.; *5-in.*, 3¾x5-in.

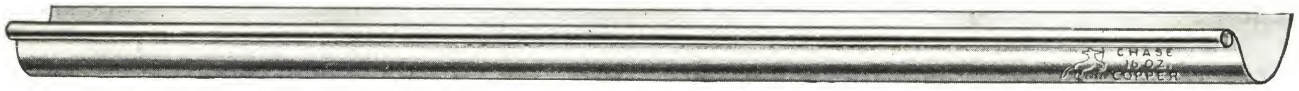
Stock Gutters

Single bead, lap joint, half round is our standard stock type; 16 oz., 10-ft. lengths, 4, 5 and 6 in. diameters.

Double bead and slip joint types, also "OG" and other special patterns can be furnished promptly to order.

Stock Downspout Heads

Where strict economy must be practiced any of the following stock patterns of Chase Copper Downspout Heads are acceptable for the average building. Quantity production permits very reasonable prices on these stock patterns all of which are available for immediate shipment from our warehouse stocks.



All of the heads listed below are available with either round or square outlets. Any of these stock patterns can also be supplied lead coated with only a few days' delay.

Fleur-de-lis Pattern

Diamond Pattern

Copper Downspout Heads

No.	Pattern	Dimensions, in.			
		Outlet	Face	Depth	Height
1A	Large diamond	2x3	10	6	9
1B	Large diamond	3x4	11	6½	9
2A	Small diamond	2x3	9	5½	7½
2B	Small diamond	3x4	10	6	7½
3A	Fleur-de-lis	2x3	9	5½	7½
3B	Fleur-de-lis	3x4	10	6	7½

Copper Downspout Strainer

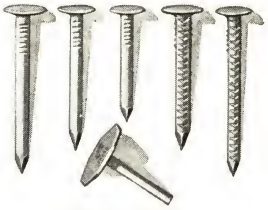
Copper Downspout Strap

Chase Copper Fittings and Small Accessories

Copper elbows, shoes, gutter mitres, end caps, wire strainers, downspout straps, gutter hangers, nails, etc., are also carried in our warehouse stocks ready for immediate shipment.

Always Use Copper Against Copper

Iron or steel if allowed to come in contact with copper, particularly in exposed places, set up a galvanic action which quickly destroys the rustable metal. Chase Copper Nails, Gutter Hangers and all other roof fastenings or supports for copper equipment, should always be made of copper.



Copper Nails

Chase Sheet and Roll Copper

Has a reputation with the roofing and sheet metal trades as a dependable, uniformly satisfactory product.

Every step in the manufacture of Chase Copper Sheet is carried out in full accord with present day standards and improved methods. By writing Chase Copper into your specifications you will have the satisfaction of knowing that you are providing for material with a thoroughly tried and proved reputation for quality.

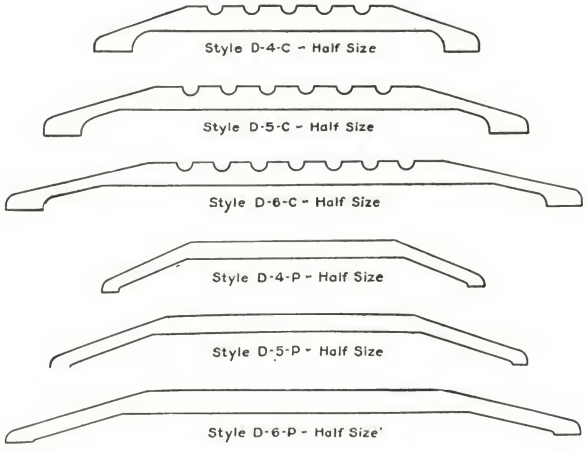
Chase Drawn Brass Door Saddles

Ready to ship from warehouse stock in two types, *plain* and *corrugated;* and in three widths, *4, 5* and *6-in.* (see drawings of cross sections opposite).

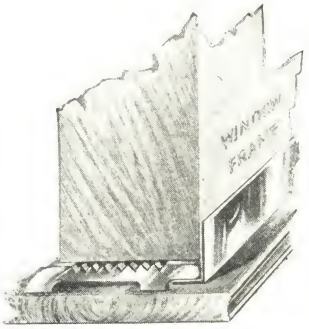
Drawn brass saddles should not be confused with *cast* brass equipment, which is much softer and less durable than drawn metal for this purpose.

Iron door saddles will rust and are unsightly; marble and stone wear away quickly, also chip and crack easily; while wood is wholly unsuitable for use where there is any great amount of traffic. Drawn brass saddles are ideal for both interior and exterior use.

Furnished ready cut to specific lengths or in random mill lengths up to *12 ft.* Notched end cuts will be made without charge provided they can be made on a circular bench saw. Any odd width up to *6 in.* can be furnished from mill where quantity required is sufficient to warrant special manufacture.

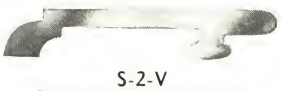


Drawn Brass Door Saddles
(Not drawn to scale)



Showing Method of Installing Chase Drawn Brass Sill Moulding
(Not drawn to scale)

S-1-F
Cross section, actual size



S-2-V
Cross section, actual size

S-3-P
Cross section, actual size

Chase Drawn Brass Weatherproof Sill Moulding

Every wood frame casement window and outside French door should have a strip of non-rustable weatherproof moulding installed on the sill.

We specialize in brass moulding for this purpose and have tools for the manufacture of a variety of types, three of which are illustrated here.

Combination brass door saddles and weatherproof sill mouldings are in great favor for suburban residences and we can furnish practically any type or size to special order provided the quantities required are large enough to warrant special manufacture.

Samples and further details regarding standard types and sizes gladly furnished upon request.

FOLLANSBEE BROTHERS COMPANY

Follansbee Forge Best Roofing

GENERAL OFFICES

PITTSBURGH, PA.

MILLS: FOLLANSBEE, W. VA. and TORONTO, OHIO

NATIONAL DISTRIBUTION

Product

FOLLANSBEE FORGE 40-LB. TERNE PLATE for—Roofing, Architectural Sheet Metal Work, Conductor Pipe, Eave Trough, and all Roof Drainage Fittings.

Brand Name

FOLLANSBEE FORGE Best Roofing 40-lb. (formerly known as Scott's Extra Coated).

What It Is

FOLLANSBEE FORGE Best Roofing 40-lb. Terne Plate is the purest practical quality, copper content, open hearth forged steel rolled into sheets and then coated with a mixture of pure tin and lead. The coating amounts to 40 lbs. for each 112 sheets 20 x 28 ins. or equivalent area (40 lbs. is the maximum amount that can be applied).

Application

FOLLANSBEE FORGE Best Roofing is supplied in flat sheets for roofing and factory-made roof drainage products. The flat sheets are fabricated by the sheet metal contractor. The usual styles are known as standing seam ("A"); flat seam ("B") and batton seam ("C"). Plates showing progressive steps in construction and application in all details is supplied on request. Ask for free Catalog No. 30-A, sent prepaid.

General Description

Adapted to all climatic conditions; light in weight; has great tensile strength; fire resistant; lightning protection. Not affected by expansion or contraction. Surface adapted to painting.

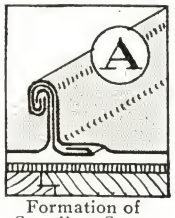
How to Identify Follansbee Forge Best Roofing

Each sheet embossed with registered trade-mark showing name and gauge number (excepting 24-gauge sheets which are stenciled)—FOLLANSBEE FORGE Best Roofing 40-lb. IC. The trade-mark for IC-IX 28, 26 and 24-gauge show, respectively, the symbols denoting thickness.

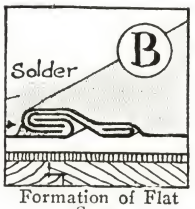
Follansbee Forge
BEST ROOFING
40 lbs.
IC

Color

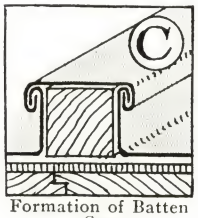
All colors—see "Painting" in Standard Specification herein.



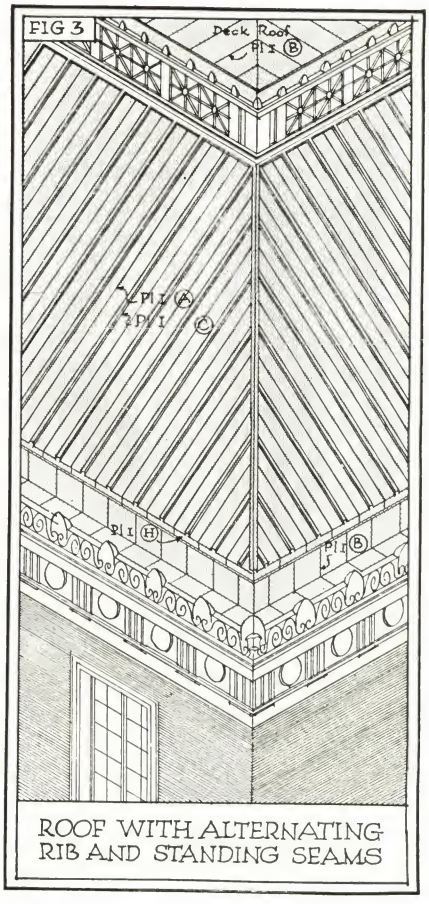
Formation of Standing Seam



Formation of Flat Seam



Formation of Batten Seam



Note: Plates showing progressive steps in construction and application in all details is supplied on request. Ask for free Catalog No. 30-A, sent prepaid.

STANDARD SIZES AND GAUGES, APPROXIMATE WEIGHT, AND PURPOSES FOR WHICH RECOMMENDED

Class of work	Style	Gauge No.	Approximate weight per square foot			Stock sizes
			Gauge No.	Weight ounces	Weight pounds	
Roofing	Standing seam	IC IX 28-gauge	IC	9.028	.564	14x20, 20x28, 14x96, 20x96, 24x96, 28x96, 30x96 in.
	Flat seam	IC IX	IX	11.07	.692	14x20, 20x28 in. (For long sheets see 28-gauge.)
	Batten seam	IX 28 gauge, 26 gauge	28	11.5	.7189	10x96, 14x96, 20x96, 24x96, 28x96, 30x96, 24x96, 20x96, 28x120, 30x120 in.
			26	13.5	.8438	
			24	17.5	1.094	Up to 30x120 in. not carried in stock but made to order in lots of one ton or more per item.
Gutter linings	Flat seam	IX 28-gauge				20x28, 14-20-24-28x96 in.
Eave troughs		26-gauge 24-gauge				10-ft. lengths
Conductor		28-gauge 26-gauge 24-gauge				10-ft. lengths
Flashings		IC IX 28-gauge				14x20, 20x28, 14-20-24-28x96 in.
Valleys		IC IX 28-gauge 26-gauge				14-20-24-28x96 in.

SPECIFICATIONS FOR FOLLANSBEE FORGE BEST ROOFING

General

All roof surfaces of this building shall be covered with FOLLANSBEE FORGE Best Roofing. (Specify IC, IX, No. 28, 26 or 24-gauge as required for all or any part). Each sheet identified with brand name. No substitute for the above brand will be allowed.

Paper Lining

FOLLANSBEE FORGE Best Roofing shall be laid on selected waterproof paper (tar paper and other qualities containing acids prohibited).

Solder

All solder used shall be strictly half-and-half. Rosin only shall be used as a flux for soldering and all rosin must be removed from seams before painting.

Nails

Use two 7/8-in. roofing nails to each cleat. (Do not drive the nails through the sheets. The nails should not go through the sheathing boards!)

Painting

FOLLANSBEE FORGE Best Roofing shall be painted both sides with one coat of imported Spanish oxide of iron (containing not less than 85% sesqui oxide of iron), ground and mixed in pure boiled linseed oil containing not less than 40% open kettle boiled linseed oil. Lower coat to be applied in the shop and thoroughly dry before sheets are laid. First upper coat applied immediately after roofing applied to roof; second or finishing coat three days later. Second coat shall be a lead base paint of any color mixed with open kettle pure boiled linseed oil.

All painting shall be done with hand brush and be evenly applied, and shall be part of the roofing contract. The roofers shall wear rubber shoes and no unnecessary walking over the roof or using the same for storage of other material will be allowed.

Guarantee

All workmanship guaranteed.

Flat Lock Style

When pitch of roof is 3 in. or less to the foot, it is to be laid Flat Lock 20x28-in. sheets, each sheet carefully notched and edged, edges ½ in. Sheets are to be laid on roof, one sheet at a time, the narrow way, and securely attached with cleats. No nails to be driven through the sheets.

Cleats

Each sheet is to be secured to sheathing with four cleats, three on the long side, one on the short side; cleats to be 1½ in. wide and carefully hooked over ½-in. edge and nailed to sheathing with two 7/8-in. roofing nails to each cleat, and cleat to be turned back over nail-head.

Seams

The seams are to be thoroughly and smoothly hammered down with wooden mallet and carefully soldered with large coppers, using not less than 6 lbs. of solder to each square of roofing.

Standing Seam Style

When there is sufficient pitch the roof is to be laid Standing Seam using 20 x 28, or 14, 20, 24, 28 or 30 x 96-in. sheets, courses applied in the narrow way, the ends to be locked with ½-in. seams and carefully soldered. The courses are to be joined with double locked Standing Seams secured to sheathing with cleats 8-in. centers, using two 7/8-in. roofing nails to each cleat. The edges for Standing Seam shall be turned up 1¼ and 1½-in., the Double Lock Standing Seam to be 1 in. when completed.

Valleys and Gutters

All valleys and gutters shall be applied Flat Lock, sheets laid the narrow way, and of sufficient pitch to prevent any water standing therein.

Flashings

For Flashings FOLLANSBEE FORGE Best Roofing to be turned up not less than 6 ins. at chimneys and fire walls and to be cap flashed 4 ins., cap flashings to extend into brickwork 1 in. and to be firmly wedged in with wedges not over 15 ins. apart. Fill openings in brickwork with portland cement.

Applying Follansbee Forge Best Roofing Long Sheets

J. MERRILL RICHARDS

JOSHUA MERRILL

LEAD COATING DIVISION

of

BOSTON GALVANIZING WORKS

ESTABLISHED 1886

119 West First Street
BOSTON, MASS.

Products

This company manufactures "B/G" Lead Coated Copper Sheets for Roofing, Flashing, Skylights, Gutters and Leaders for architectural construction which requires greater resistance to discoloration than is afforded by ordinary sheet metal construction.

Commercial *Hot-Dip* Galvanizing.

For "Unity" Skylights and Magnalite Diffusing Glass, see J. Merrill Richards in Manufacturers' Index.

Advantages of Lead Coated Surfaces

Pure lead is the least chemically active of any of the low-priced metals. It is substantially unaffected by any of the common acids or alkalis, especially in such concentrations as are met with in building structures. It is also resistant to decomposition by electrolysis which results when dissimilar metals (not in chemical combination or alloyed with each other) are brought into contact, especially in the presence of moisture. Pure lead is extremely ductile at atmospheric temperatures and will sustain great abuse and distortion without rupture. This makes it an ideal material for use as a barrier to moisture and dampness where there is a possibility of movement of the supporting material due to settlement or deflection. Because of lead's lack of strength, stiffness and tendency to "creep" its use alone is limited. These features, however, are overcome by "B/G" Lead Coated Copper Sheets.

The lack of elasticity of lead makes it a sound absorber rather than a reflector as is the case with most metal. Its use is therefore desirable where the resonance of other metal would be objectionable.

The use of "B/G" lead coated copper is highly desirable in locations having an acidic atmosphere caused from within, or by the burning of oil and solid fuels in the neighborhood. It weathers to a true dull lead color which blends with most any type of architecture and will neither stain nor discolor stone, concrete or paint.

"B/G" Lead Coated Copper Sheets

A "B/G" Lead Coated Copper Sheet has all the good qualities of the lead combined with those of copper, and our method of manufacture produces such perfect adhesion between the two metals that the two become a unit. It will last the life of a building.

Flashings

"B/G" Lead Coated Copper Sheets provide a perfect material for roof flashings, roof coverings, scuppers, spouts, gutters and leaders, on either fireproof or frame buildings.

Sheet Metal Skylights

Skylights manufactured with "B/G" Lead Coated Copper Sheets will be more permanent. They are particularly economical over rooms containing electric batteries, plating baths, chemical laboratories, dyehouses or other equipment which emits acid fumes, or in other locations subject to corrosive influences from within.

Manufacturing Facilities

The Lead Coating Division of the Boston Galvanizing Works has complete facilities in both equipment and in technical and skilled personnel for the manufacture of all lead coated copper products.

Specifications

All exposed and through-wall flashings and sheet metal work as designated on plans shall be "B/G" Lead Coated Copper Sheets as furnished by the Lead Coating Division of the Boston Galvanizing Works, South Boston, Massachusetts. Sheets shall be coated evenly on each surface with pure lead. The lead coating shall weigh between 12 and 16 lbs. per 100 sq. ft. Each commercial sheet shall bear the name of "B/G."

Distribution

"B/G" Lead Coated Copper Sheets are furnished by all leading roofers and sheet metal workers everywhere.

LYON, CONKLIN & CO. INC.

Manufacturers of Lyonore Metal Products

WASHINGTON, D. C. BALTIMORE, MD.

Products

LYONORE METAL GALVANIZED SHEETS, CONDUCTOR PIPE, EAVES TROUGH, GALVANIZED and TIN ROOFING.

Lyonore Metal, an Alloy—Description and Uses

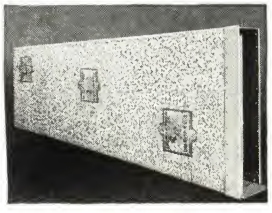
Metal, constantly exposed to the gases and matter held in suspension in the atmosphere is subject at all times to electrolysis, the cause of rust, corrosion or disintegration.

Lyonore Metal is an alloy made according to a formula (the exclusive property of this company) which offers in a practical sheet metal extremely high resistance to corrosion. Its elements are of such character and so proportioned that this alloy is not unduly influenced by electrolysis. It outlasts ordinary sheet metal many times.

Lyonore Metal Galvanized Sheets

Lyonore Metal has been specified and used for ventilating ducts, smokestacks and breechings, elevator shaft linings and for all sheet metal purposes in the finest office buildings, hotels and institutions along the Atlantic Seaboard.

For positive identification, this trade mark is stenciled on every sheet of Lyonore Metal three times diagonally lengthwise.



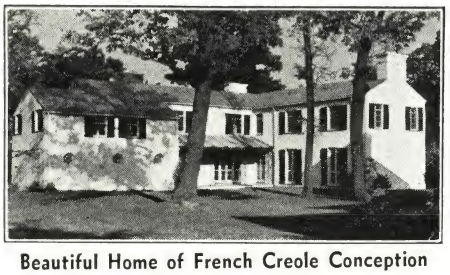
Standard Specifications for Ventilating Ducts and Dust Collectors—All duct work shall be of galvanized Lyonore Metal, chromium-nickel alloy, of weights and gauges noted and shall be formed with the trade-mark (as here shown) on the outside so that it can be seen on each section. All work to be done in accordance with the Standard Specifications of the National Association of Sheet Metal Contractors.

(Specify gauge of sheets for duct sizes as follows:)

16-in. diameter and smaller.....No. 26 gauge
17 to 30-in. diameter.....No. 24 gauge
31 to 40-in. diameter.....No. 22 gauge
41 to 60-in. diameter.....No. 20 gauge
61-in. and over diameter.....No. 18 gauge

Corrugated Sheets

Lyonore Metal is furnished in galvanized corrugated sheets in all standard gauges. Standard corrugations are 5/8, 1¼, 2, 2½, 3 and 5 in. Standard lengths are 5, 6, 7, 8, 9, 10 and 12 ft. Covering width is 24 in. Can also be furnished in Pressed Standing Seam, V-crimped, Weatherboard Siding, Beaded Ceiling, Brick and Stone Siding, etc.



Beautiful Home of French Creole Conception
Designed by PALMER & LAMDIN
Roof of LYON BRAND Tin

Baltimore Trust Building
TAYLOR & FISHER; SMITH & MAY, Architects
REEDER, EISER & AKERS, Consulting Engineers
H. E. CROOK CO., INC., Sheet Metal Contractor

Lyonore Metal Conductor Pipe and Eaves Trough

Conductor Pipe—Made in 10-ft. lengths in six styles: Plain round and square, corrugated round and square, crimped round and square. Ends are deeply crimped to slip easily into place and to bind snugly and tightly when fitted. Furnished in gauges 28, 26 and 24—each length die-stamped, for quick identification, "Lyonore Metal, an alloy."

Eaves Trough—Made in 10-ft. lengths in a wide variety of styles: Single or double bead—slip or lap joint-gauges, 28, 26 and 24—each length plainly die-stamped "Lyonore Metal, an alloy."

Standard Specifications for Sheet Metal Work

All galvanized sheet metal on this building shall be Lyonore Metal of gauges specified for each class of work. Work to be done in accordance with the Standard Specifications of the National Association of Sheet Metal Contractors.

For best results, we recommend that the following gauges be specified for various classes of sheet metal work:

For conductor pipes, hanging gutters, eaves trough.....No. 26 gauge
For cornices and skylights.....No. 24 gauge
For gravel strips and flashings.....No. 26 gauge

For ventilating ducts and dust collectors (inside work) specify gauge number according to size of ducts as follows:

16-in. diameter and smaller.....No. 26 gauge
18-in. diameter.....No. 24 gauge
Larger than 18-in. diameter.....No. 22 gauge
For paneling, moulding and special work.....No. 24 gauge

Lyonore Metal Roofing Tin Plates

LYON BRAND has a Lyonore Metal Base of carefully selected perfect sheets, and carries 40-lb. coating. Coated by the genuine pure palm oil process, with a mixture of pure new tin and new lead, in the proportions of 1 part tin and 3 parts lead, making this a superior tin roofing plate. 1C thickness is generally used for roofing; 1X thickness for valleys and secret gutters.

Standard Specifications for Tin Roofing—(Standing seam, flat seam or ribbed.)

All tin roofing on this building shall be Lyonore Metal Base, Lyon Brand 40-lb. coated, 1C thickness for all roofing, and 1X thickness for valleys and gutters, to be done in accordance with the Standard Specifications of National Association of Sheet Metal Contractors.

HOYT HARDLEAD PRODUCTS

NATIONAL LEAD COMPANY
HOYT HARDLEAD PRODUCTS DIVISION

111 Broadway, NEW YORK, N. Y.

PERMANENT EXHIBITS LOCATED IN THE FOLLOWING CITIES

NEW YORK, N. Y., Architects Samples Corp., 101 Park Avenue
DETROIT, MICH., Architects Exhibit, Inc., Barlum Tower
BOSTON, MASS., Architects Exhibit, Inc., 11 Beacon Street
CLEVELAND, OHIO, Building Arts Exhibit, Bldrs. Exch. Bldg.

Products

HOYT HARDLEAD ROOFING SHEETS; RAIN WATER PIPES; RAIN WATER PIPE HEADS; PIPE BANDS; GUTTERS; SPANDRELS; FINIALS; STATUARY GARDEN ORNAMENTS; ORNAMENTAL HOYT HARDLEAD WORK of every description.

For our pages on Paints, see Manufacturers' Index.

Hoyt Hardlead

Hoyt Hardlead has a much greater tensile strength than soft lead, which permits its use in comparatively thin sheets, making it thoroughly practical and adaptable to modern building construction. It can be stamped, formed or cast in any shape desired. When exposed to the atmosphere it takes on a soft gray, non-staining patina that brings out the true value of adjacent materials and gives a balance to these materials that cannot be obtained with other metals. It will lend dignity and character to any structure where permanence and beauty are desired. It is used for roofing, flashings, cornice coverings and other building purposes where it is practical to use sheet metal.

It is rolled in sheets 24, 30 and 36 in. wide and 96 in. long, weighing 2½, 3, 4, 6 and 8 lb. to the sq. ft. The proper weight of Hoyt Hardlead Sheets depends upon the purpose for which they are to be used. For roofing, cornice coverings and base flashings generally the 3-lb. sheet is recommended, and for cap flashings and batten roofs where the battens are spaced 24 in. or less on centers the 2½-lb. sheet may be used.

Spandrels

Architecturally and economically there are many advantages in the use of Hoyt Hardlead Spandrels. It is possible to obtain in Hoyt Hardlead effects that cannot be duplicated in other materials which in contrast present an extreme severity of line. Softness of line and low relief are characteristics of stamped Hoyt Hardlead.

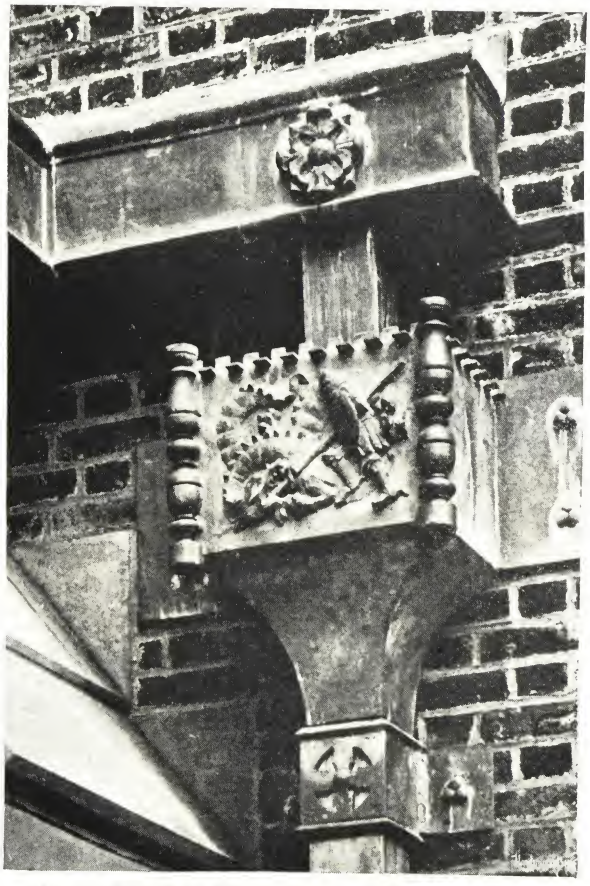
The soft gray color of Hoyt Hardlead is uniform and permanent.

Unlike other metals, Hoyt Hardlead Spandrels require no painting nor other maintenance, and do not stain adjacent masonry.

Catalogue

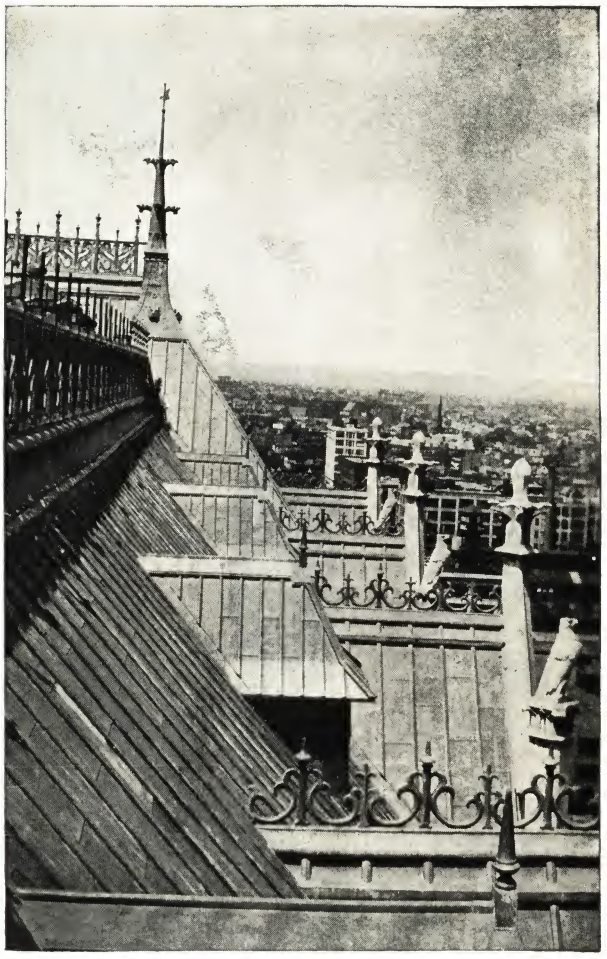
Our catalogue illustrates a complete line of architectural and ornamental Hoyt Hardlead work. This catalogue will be sent to architects on request.

Roof, Rain Water Pipe Heads, Pipe and Gutter, National Cathedral, Mount St. Albans, Washington, D. C.
FROHMAN, ROBB & LITTLE, Boston, Mass., Architects



Special Cast Rain Water Pipe Head, Pipe and Gutter, St. George Chapel, Newport, R. I.
CRAM & FERGUSON, Boston, Mass., Architects

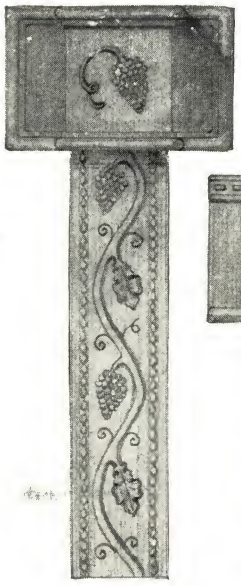
Spandrels, The American Bankers Insurance Company Building, Chicago, Ill.
CHILDS & SMITH, Chicago, Ill., Architects



All Roofs, Flashings, Rain Water Pipes, Gutters, Finials and Crestings, Prudential Life Insurance Co. Building, Newark, N. J.
CASS GILBERT, New York, N. Y., Architect

Bays, Porches, Flashings, Cupolas, Spire, Crestings, Finials, Gutters and Rain Water Pipes, Kings County Hospital, New York, N. Y.
LEROY P. WARD, New York, N. Y., Architect

B-82



L-82
2 in. x 3 in.
3 in. x 4 in.

B-80

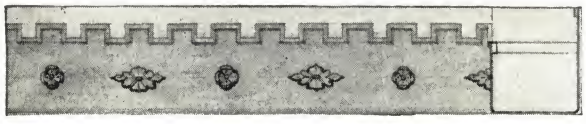
L-80
3 in. and 4 in. dia.

B-84

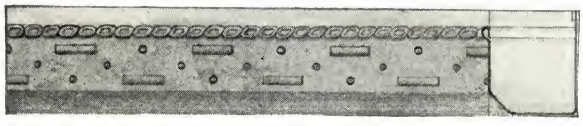
L-84
2 in. x 3 in.
3 in. x 4 in.

Hoyt Hardlead Antique Wrought Finish Ornamental Rain Water Pipe
Made from three-pound sheet

G-41



G-43

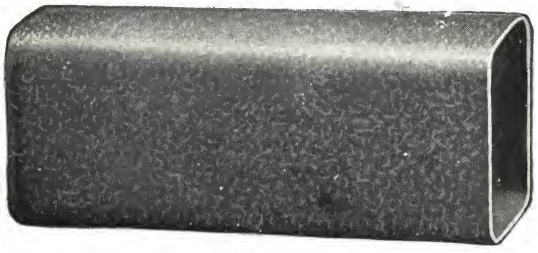


G-45

G-46

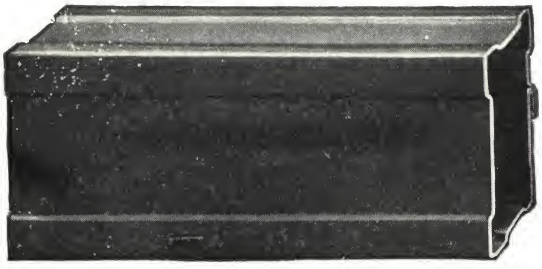
Hoyt Hardlead Antique Wrought Finish Ornamental Gutter
Made from four-pound sheet

We can also execute special designs in accordance with architects' drawings



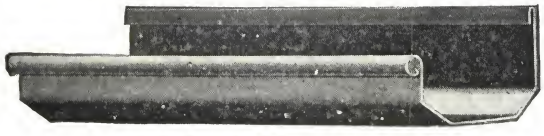
Seamless Rain Water Pipe

Made from Hoyt Hardlead in the following sizes: 2x3 in., 2½x3½ in., 3x4 in., 3½x5 in., 4½x4½ in., 3 in. round, and 4 in. round. It can be furnished smooth or with a rough cast surface as desired



Rolled Sheet Rain Water Pipe

Made from Hoyt Hardlead rolled sheet in the following sizes: 2x2 in., 3½x3½ in., 2½x3¼ in., 2½x4¼ in., 3 in. and 4 in. octagon and 3 in. and 4 in. round and corrugated



Rolled Sheet Gutter

Made from Hoyt Hardlead rolled sheet with reinforced beaded edge in the following sizes: 3 in., 4 in., 5 in. and 6 in., half round and octagon

REPUBLIC STEEL CORPORATION

SUCCESSOR TO CENTRAL ALLOY STEEL CORPORATION

Toncan Copper Mo-lyb-den-um Iron Rust and Corrosion Resisting Sheets

YOUNGSTOWN, OHIO

For Enduro Stainless Steels and Republic Steel Pipe, see Manufacturers' Index

Products

TONCAN IRON SHEETS: Hot Rolled, Annealed, and Galvanized.

TONCAN IRON ROOFING: Roll, V-Crimped, Pressed Standing Seam and Corrugated.

TONCAN IRON SIDING: Corrugated, and Reproductions of Rock Faced Stone, Rock Faced Brick and Lapped Weatherboard.

Also Toncan Iron Corrugated Sheets, straight and curved, for use with concrete work and other special purposes; Toncan Iron Pipe, Plates, Wire, Bolts, Rivets, etc.

REG. U.S. PAT. OFF. TONCAN COPPER Mo-lyb-den-um IRON TRADE-MARK

Advantages

In Toncan Iron the architect finds a most satisfactory solution for the sheet metal problem. It enables him to specify a moderate priced sheet metal of unquestionable durability—a durability proved by many years of use in thousands of structures and in every form of severe sheet metal service.

Description and Uses

Toncan is a carefully made commercially pure iron alloyed with copper and mo-lyb-den-um to obtain the greatest possible resistance to rust and corrosion. Its long life and easy working qualities are a matter of common experience.

Toncan Iron is widely used for expanded metal lath, eaves trough, conductor pipe, ridge roll, valleys, flashing, cornice, balcony, marquise, window frames, skylights, tanks, ventilation, refrigeration—in fact, for every purpose which demands a durable iron.

Identification

The trade-mark shown above is stamped in two or three places on every Toncan Iron sheet and die stamped on eaves trough, conductor pipe, elbows, etc.

Sources of Supply

Jobbers and tinners everywhere sell Toncan Iron sheets and products. On request, we will supply names of manufacturers or dealers who can furnish any special Toncan Iron product you may have in mind.

Specification Data

"All sheet metal work shall be of Toncan Copper Mo-lyb-den-um Iron manufactured by the REPUBLIC STEEL CORPORATION, of Youngstown, Ohio," is a safe specification; for Toncan Iron meets all the requirements of modern sheet metal practice.

For trough and pipe, we recommend No. 26 gauge. For gutter, flashing, valleys, etc., No. 24 or, better still, No. 22 gauge. Roofing may be No. 26, 24 or 22 gauge. The heavier gauges should always be used where corrosive conditions are severe as along the sea coast or in a smoky atmosphere. Further information on Toncan Iron will be supplied promptly.

Roll Roofing

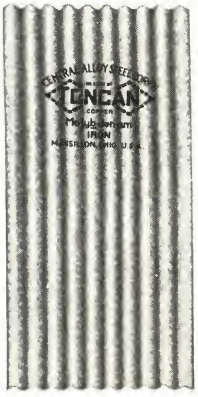
Painted or galvanized. Excellent for low pitched roofs. Covering width, 24 in. Each roll lays 100 sq. ft. on the building

Three V-Crimp Roofing

An attractive form of Toncan Iron roofing, covering width 24 in.; gauges, No. 20 and lighter; also made with 2 and 5 V-form

Expanded Metal Lath

Many architects specify Toncan Iron Lath for all lath work as an extra assurance of lasting service. It should always be used for stucco and other exterior or exposed work.



Corrugated Sheets for Roofing and Siding

Gauges No. 10 and lighter; 1¼ and 2½-in. corrugations are standard

Toncan Iron Conductor Pipe

Round corrugated, square corrugated and plain round conductor pipe. Lengths, 8 and 10 ft. All diameters. Elbows, miters and cut-offs to match

Toncan Iron Eaves Trough

Length, 10 ft. All widths; and gauges Nos. 28, 26 and 24

Toncan Iron Expanded Lath

Made in standard weights of 2.2, 2.5, 3.0 and 3.4 lb. per sq. yd. Sheets, 24x96 in., 9 sheets or 16 sq. yd. per bundle

Corrugated Ridge Roll

2½ or 1¼-in. corrugations. Lengths, 27 and 96 in.

Corrugated End Wall Flashing

Flat side on wall, 2 in. Corrugated apron, 4 in. Lengths, 27 and 96 in.

References

Thousands of installations in all parts of the country are proving the lasting qualities of Toncan Iron. A few are mentioned below. Ask for others.

Arlington Memorial Bridge, Washington, D. C., McKim, Meade & White, New York, N. Y., Architects

Atlantic City Auditorium, Atlantic City, N. J., Lockwood Greene, Inc., Boston, Architects and Engineers

Federal Reserve Bank Building, Cleveland, Ohio, Walker & Weeks, Cleveland, Architects

R. J. Reynolds Tobacco Co. Headquarters, Winston-Salem, N. C., Shreve, Lamb & Harmon, New York, N. Y., Architects

Sterling Law School, Yale University, New Haven, Conn., James Gamble Rogers, New York, N. Y., Architect

Pennsylvania Railway Broad Street Station, Philadelphia, Pa., Graham, Anderson, Probst & White, Chicago, Architects and Engineers

Kansas City Star Building, Kansas City, Mo., Jarvis Hunt & Co., Chicago, Architects

North Station and Manger Hotel, Boston, Mass., Funk & Wilcox, Boston, Architects; Felheimer & Wagner, New York, N. Y., Associate Architects

California Palace of the Legion of Honor, San Francisco, Calif., G. A. Applegarth, San Francisco, Architect

University of Chicago Medical Building, Chicago, Ill., Coolidge & Hodgdon, Chicago, Architects

Carew Tower and Netherland-Plaza Hotel, Cincinnati, Ohio, Walter W. Ahlschlager, Chicago, Architect; Delano & Aldrich, New York, N. Y., Associate Architects

California Palace of the Legion of Honor, San Francisco, Calif.

G. A. APPLEGARTH, Architect

30,000 sq. ft. of Toncan Iron Skylight used here

THE NEWPORT ROLLING MILL CO., INC.

Exclusive Manufacturers of GOHI (Genuine Open Hearth Iron) Rust-resisting Sheets for Roofing, Siding and Accessories

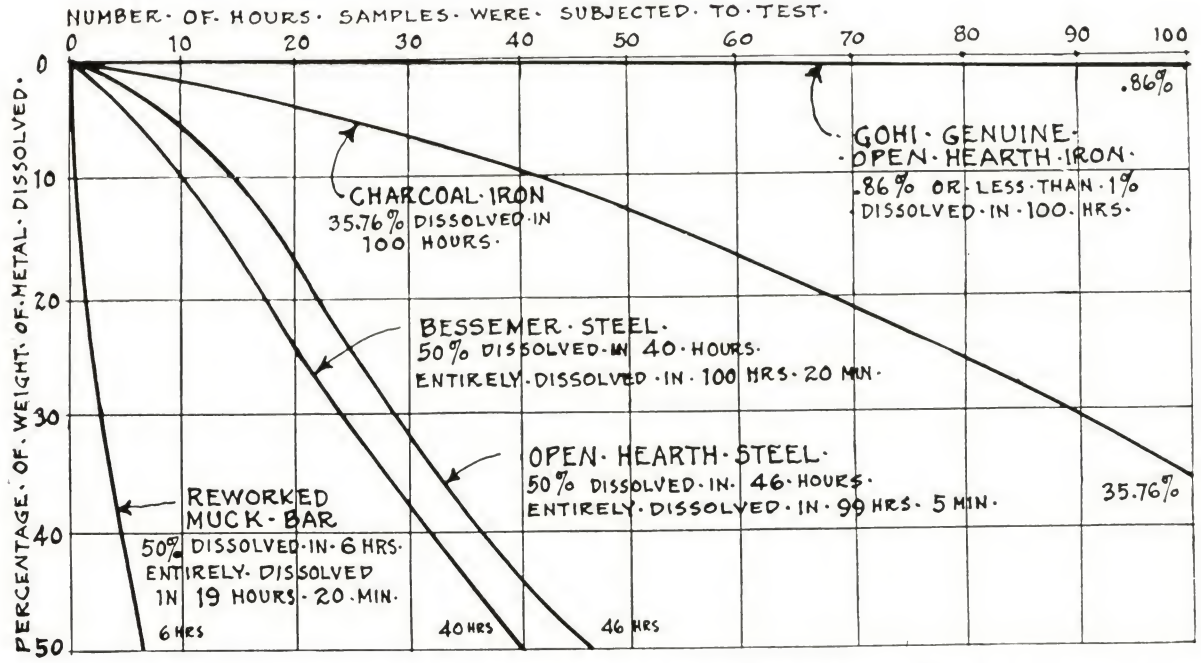
NEWPORT, KY.

Products

GOHI (GENUINE OPEN HEARTH IRON) includes Black and Galvanized Sheets, Plain or Corrugated for:

Corrugated Arches; Corrugated Awnings; Corrugated Ridge Rolls; Pressed Standing Seam Roofing; Plain Roll Roofing; Roll and Cap Roofing; Weatherboard Siding; Beaded Ceiling; Beaded Siding; Brick Siding; Rock Face Brick Siding; Rock Face Stone Siding; Metal Shingles; Plain Ridge Roll; Cornices; Louvres; Eaves Trough; Conductor Pipe; Elbows and Shoes; Mitres; Cut-offs; Skylights and Metal Ceilings.

TRADE-MARK



ACCELERATED CORROSION TEST ON GOHI AND OTHER METALS

An Analysis of Gohi—Pure Iron Copper Alloy

The accelerated corrosion test, a chart of which is reproduced above, illustrates in a striking way the resistance of GOHI—*pure iron copper alloy*. These materials were put into a bath of sulphuric acid and allowed to remain completely immersed for a period of one hundred hours. As may be seen from the chart, only 0.86 per cent of GOHI—Pure Iron Copper Alloy—was consumed in this period, while the only metal which remained at all at the end of the test weighed 35.76 per cent less.

The following analysis of GOHI—Pure Iron Copper Alloy—demonstrates the unusual purity of GOHI.

Carbon, not exceeding	.015
Manganese, not exceeding	.025
Phosphorus, not exceeding	.006
Sulphur, not exceeding	.035
Silicon, not exceeding	.005
Oxygen, not exceeding	.035
Nitrogen, not exceeding	.002
Hydrogen, not exceeding	.002
	.125
Iron, plus copper, by difference	99.875

The copper content in GOHI—Pure Iron Copper Alloy—will show not less than two-tenths (.2) or over three-tenths (.3) of one per cent (1%).

A variation not to exceed four hundredths (.04) of one per cent (1%) in the amount of impurities is allowed to cover the recognized analytical variation between expert chemists.

Why You Should Specify Gohi

GOHI (Genuine Open Hearth Iron) is absolutely uniform in quality, being manufactured from the highest grade of selected materials, thus assuring one of the best rust-resisting metals for any and all conditions. GOHI will give longer life and is more durable. On account of its superior working qualities, labor costs are reduced. Lasting qualities considered, GOHI is more economical than most sheet metal building materials you can specify.

Look for Gohi Trade Mark

There is a GOHI formed product for every need in sheet metal—flat sheets, corrugated sheets, siding, roofing, conductor pipe and accessories.

The GOHI trade-mark on each individual sheet or formed piece of sheet metal is your guide to unquestioned durability. Look for this trade-mark on your sheet metal and be relieved of future worry about troublesome maintenance and costly replacements.

Where to Get Gohi

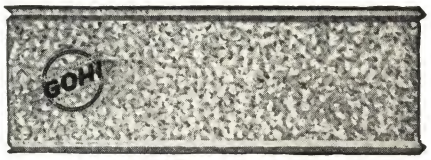
Jobbers, dealers, hardware concerns, etc., everywhere sell GOHI (Genuine Open Hearth Iron) sheets and formed products. On request, we will supply names of distributers who can furnish GOHI in sheets or in the formed products specified above.

Write for Booklet

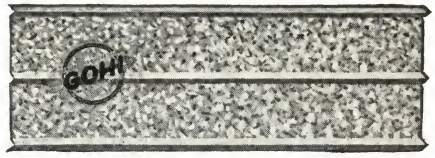
We recently had prepared by a firm of architects, a file folder containing a complete analysis and specifications of GOHI (Genuine Open Hearth Iron). This valuable information should be in the hands of every architect specifying quality sheet metal work. A copy is yours for the asking.

We have also available for your reference, leatherette folders containing sample gauges of GOHI which are mailed free upon request.

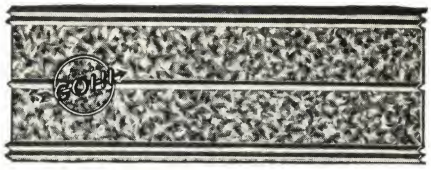
Corrugated Square Conductor Pipe



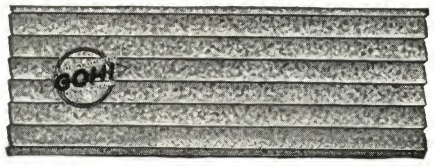
2-V Crimp Roofing



3-V Crimp Roofing



5-V Crimp Roofing

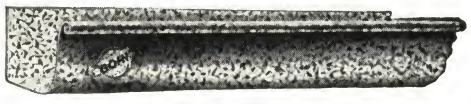


Weatherboard Siding

Corrugated Ridge Roll

Formed Valley

Eaves Trough



O. G. Gutter

Plain Round Conductor Pipe

Corrugated Round Conductor Pipe

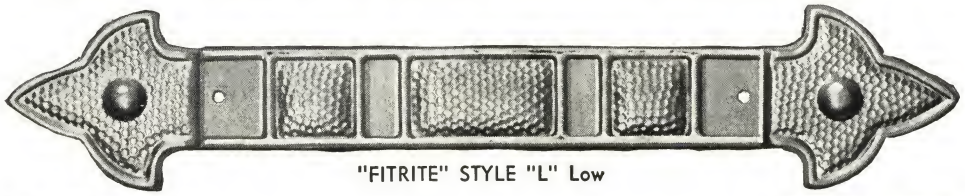
RIVAL STRAP CORP.

308 West 20th Street
NEW YORK, N. Y.

Telephone: CHelsea 3-2400

"FITRITE" AND "RIVAL" ORNAMENTAL CONDUCTOR PIPE STRAPS

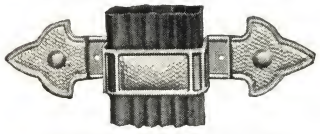
One Piece—Copper or Zinc (Patented July 10, 1928; January 6, 1931)



"FITRITE" STYLE "L" Low

"RIVAL" STLYE "B"

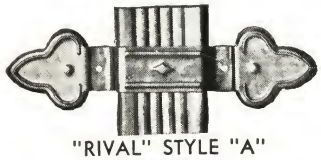
"FITRITE" STYLE "L" Low



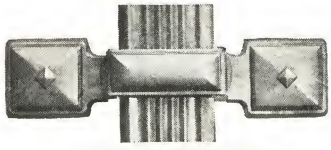
"FITRITE" STYLE "L" Low

"FITRITE" STYLE "H"
(High—3/8" Flange)

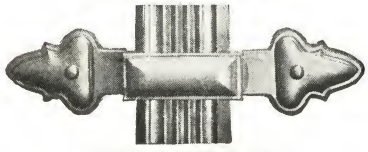
"RIVAL" STYLE "A"



"RIVAL" STYLE "A"



"RIVAL" STYLE "B"



"RIVAL" STYLE "C"

Material

Made in copper for copper leaders and zinc for zinc or galvanized leaders. Can also be furnished in lead-coated copper or zinc.

Style "L" and "A"—Made of heavy gauge metal, strong enough to hold conductor pipe without using hooks.

Style "H", "B", and "C"—Made of 16-oz. copper or 11-gauge zinc.

Sizes

"Fitrite" Style "L" and "Rival" Style "A"—

**2 in.*—For 2-in. round or 2-in. square corrugated pipe (1¾ x 2¼ in.)
3 in.—For 3-in. round or 3-in. square corrugated pipe (2⅜ x 3¼ in.)
4 in.—For 4-in. round or 4-in. square corrugated pipe (2¾ x 4¼ in.)

*2 in. size made in "Fitrite" Style "L" only.

"Fitrite" Style "H" and "Rival" Styles "B" and "C"—

3 in.—For 3-in. square corrugated pipe (2⅜ x 3¼ in.)
4 in.—For 4 in. square corrugated pipe (2¾ x 4¼ in.)

Installation

Styles "L" and "A" to be used without hooks. Styles "H", "B" and "C" can be used with or without hooks. When hooks are used, tinsmith slits edge of strap at desired point, allowing for proper distance from conductor to wall of building.

Features

All style ornamental straps are of one piece, and are shipped flat. They can be bent or formed by hand on the job and require no soldering.

There is a design of strap to meet most every requirement. "Fitrite" Ornamental Straps have hand-hammered effect. All straps are deep-stamped.

Quantity production enables us to offer these straps at low cost. "Fitrite" or "Rival" Ornamental Straps can be used economically wherever a conductor pipe strap is required.

Specification

All leaders or conductor pipes shall be properly fastened to walls with one-piece ornamental conductor pipe straps, "Fitrite" Style "L" or "H" or "Rival" Style "A", "B" or "C" as manufactured by Rival Strap Corp., 308 West 20th Street, New York, N. Y.

Copper straps shall be used for copper leaders.

Zinc straps shall be used for zinc or galvanized leaders.

Lead-coated straps shall be used for lead-coated leaders.

REVERE COPPER AND BRASS INCORPORATED

EXECUTIVE AND GENERAL SALES OFFICES
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CINCINNATI, OHIO, 2616 Carew Tower
MILWAUKEE, WIS., 229 East Wisconsin Avenue

Products

REVERE SHEET, STRIP and ROLL COPPER and REVERE LEADTEX (Lead Coated Copper) for roofing, flashing, conductor pipes and ornamental work.

For Revere Brass Pipe, PR (all-copper) Pipe and Architectural Metals in Sheets, Extruded and Drawn Shapes and Tubes, see Manufacturers' Index.

REVERE SHEET COPPER

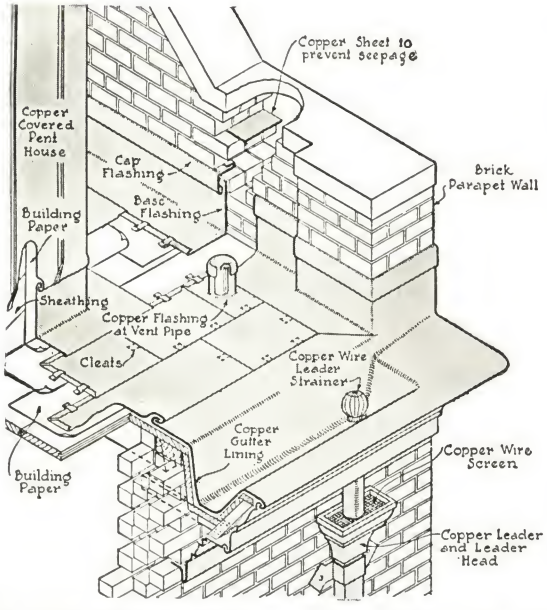
Revere Sheet Copper, with over a century of reputation for quality, is made by Revere Copper and Brass Incorporated, and marketed under the Revere Red, White and Blue Label.

Revere makes every type of sheet copper in use today, including soft and hard copper, lead coated copper, nickel and chromium plated copper, and tinned copper.

Sheet Copper for Roofing

Revere Sheet Copper is the ideal roofing material. Because it cannot rust, and because of the absolute protection it affords under all types of weather conditions, it is also an economical material.

It does not require painting or protective treatment; the first cost is the only cost involved. For these reasons, the ideal roof is one in which copper is used throughout.



However, where the preference of the home owners or style of architecture dictates roofs of other materials—such as slate, shingles, or composition shingles, clay or cement tile—Revere Sheet Copper also plays an important part.

Flashings, valleys, ridges, cornice, gutters, eaves troughs and conductor pipes should be constructed of Revere Sheet Copper to insure maximum protection against weather.

Soft Copper

Soft or (Roofing Temper) Copper should be used for roofing purposes and all flashings regardless of type. This type of copper is particularly suitable for these uses inasmuch as it is easily worked and shaped and stands up well under temperature stresses. There is no place in flashing—or counter flashing—where soft sheets will not serve better than hard copper. The latter does not lend itself so readily to shaping on the job.

Hard Copper

The material of all shaped gutters, eaves troughs, drips, waterbars, leaders, cornices, etc., should be hard (cornice temper) copper. Its stiffness is necessary to maintain the shape, especially against ice and snow loads. As most shapes are of mill manufacture, the process is such that the chance of fracture at the bends is minimized. All manufacturers of gutters, leaders, etc., make them of hard (cornice temper) copper because experiment and experience has proved the practicability of this.

Parallel Edge Strip Copper

Revere Parallel Edge Strip Copper is recommended particularly for conductor pipes of all kinds including gutters, leaders, etc. This product, free from waves and wrinkles and correctly tempered, with edges parallel, is furnished in lengths from 5 to 10 feet and in widths from 6 to 16 inches, which makes for economy in forming. Each strip is stamped "Revere—Standard 16 oz."

Gutter Linings and Cornice Ornaments

Gutter linings and cornice ornaments are exceptions to the above rule concerning the use of soft and hard temper copper. They should be made of soft (roofing temper) copper.

Gutter linings in any length are peculiarly subject to temperature stresses. The continual warping to which the sheets are subjects is likely to cause failure by fatigue at the bends when hard copper is used. Soft copper overcomes this cause of failure.

For ornaments that are stamped from dies, soft copper is superior to hard copper, for the former works more easily and is less liable to fracture.

Specifications

Copper for flashing and roofing shall be Revere standard 16 oz. (20 oz. or other weights) soft (roofing temper) copper and shall be rolled from cakes complying with the A. S. T. M. requirements for Electrolytic copper.

Copper for cornice work, gutters, eaves troughs, downspouts (leaders), shall be Revere Standard 16 oz. (20 oz. or other weights) Hard (Cornice Temper) copper.

Sources of Supply

Revere Sheet Copper is readily and quickly obtained through authorized distributors in all parts of the country.

Literature

We will be pleased to mail you a copy of "Copper Roofing," which has been prepared especially for architects and roofing contractors and "Copper Flashings" a handbook of data on the use of copper as a flashing material with standard details of construction and specifications for sheet copper work.

Samples

Samples of sheet copper in any of the following finishes will be gladly sent to architects upon request—plain soft or hard, nickel plated one side, tinned one side, Leadtex (lead-coated copper).

REVERE LEADTEX

(Lead Coated Copper)

Having the Beautiful Weathering and Protecting Finish of Lead plus the Strength and Wearing Qualities of Pure Copper

The Exceptional Architectural and Artistic Qualities of Leadtex

For hundreds of years lead has been used by architects for many purposes. It has been known and admired for its decorative and easily workable qualities for exterior ornaments, roofs, leaderheads, gutters, flashings, etc. The patina which lead takes, when exposed to the weather, has a soft neutral tone which harmonizes with almost any material and color scheme.

Formerly the cost, softness, and weight of heavy sheet lead and lead castings were its principal drawbacks. Leadtex has overcome these.

What Leadtex Is

Revere Leadtex is Revere Sheet Copper, coated with pure lead. The copper, a rust proof metal in itself is further protected against corrosion and staining by the non-rusting, non-staining coating of lead. This provides the architect with a light, flexible and practically everlasting sheet metal at a minimum of cost.

The Special Advantages of Leadtex

Leadtex possesses the advantages of the old lead work with some important additional features.

The Finish: is similar to lead as far as weathering and lasting qualities are concerned.

Stiffness—On account of the additional strength and stiffness given by the copper, Leadtex can be used in light gauges of metal in the same manner and for the same purposes that copper has always been used.

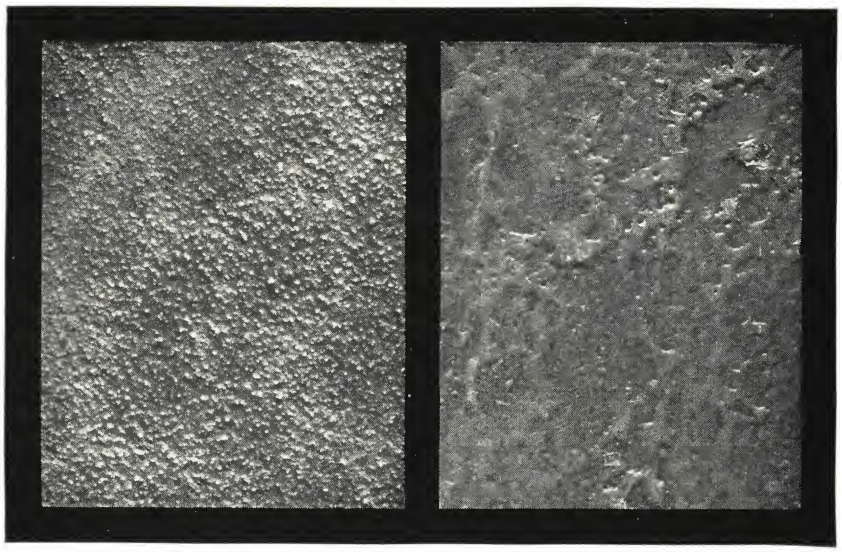
Lightness—Its lightness reduces the weight of construction in many instances such as on roofs, domes, spandrels, and ornamental motifs. This is an important consideration in modern building construction. The use of Leadtex for spandrels is very well illustrated in the accompanying photographs of spandrel panels.

Non-staining—The lead coat on the copper prevents the action of corrosion on the copper which sometimes causes the green staining of other materials with which it is used. This is particularly true if used near salt water or where exposed to the action of sulphur fumes from smoke stacks. It is particularly advisable that Leadtex be used as flashing, if in contact with stone, marble, stucco, or cement work.

Relief and Ornament—The depth of relief as well as delicacy of detail possible with Leadtex is readily appreciated in the accompanying illustrations of spandrels. Leadtex can be formed or stamped in the same manner as is usual with copper without breaking the lead coating.

Cost—The advantages of costing only slightly more than sheet copper makes Leadtex a product of real importance to the architect for many kinds of work on which it was impossible to use lead formerly on account of cost.

These Revere Leadtex Spandrels are Three of the Five Designs Used in 512 Spandrels in William Taylor Hotel, San Francisco, Calif.
They illustrate clearly the depth of relief and the delicacy of detail possible with Leadtex.
Lewis P. Hobart, Architect. Fabricated and installed by Forderer Cornice Works.



The Two Finishes in which Revere Leadtex is Available
Left: Leadtex Extra Heavy.—*Right:* Leadtex Standard and Leadtex Heavy.

Leadtex—Its Various Weights and Types

Leadtex is made with a copper base of any gauge and temper and in three weights of lead coatings. Standard weights of lead coatings are as follows:

Leadtex Standard—Coated with approximately 12 to 15 lbs. per 100 sq. ft. applied to *both sides of the sheet* (6 to 7½ lbs. per side.) This is the minimum weight of lead coating that should be used on the copper sheet for achitectural purposes.

Leadtex Heavy—Coated with approximately 25 to 30 lbs. per 100 sq. ft. on *both sides of the sheet* (12½ to 15 lbs. per side.)

Leadtex Extra Heavy—***Single***—Coated with approximately 25 to 30 lbs. per 100 sq. ft. applied on *one side of sheet only.*

Double—Coated with approximately 40 to 50 lbs. per 100 sq. ft. applied on *both sides of the sheet* (20 to 25 lbs. per side.)

Copper Base—Made in 16-18-20, 24 oz. and heavier soft or hard copper supplied in the foregoing weights of lead coatings.

Types of Finishes Produced

There are two standard types of finishes of Leadtex for flat sheets before forming. While there will be slight variations of the figure in the surface due to the method of manufacturing, the surface will approximate those illustrated. The surface of the Extra Heavy has a slightly more pebbly appearance than that of the Standard Weight.

Suggested Uses for Leadtex

It is suited to all types of buildings in almost any type of architecture. It has been used in the following types of buildings:

Residences	City halls and	Churches
Convention halls	Other public build-	Mausoleums
Office buildings	ings	Hotels

Leadtex can be used in practically any type of building regardless of architectural style. It insures permanence and quality of construction for:

Roofing	Cornices	Leader heads
Flashing	Leaders	Dormers
Eaves trough	Skylights	Ornamental motifs
Curved head dormers	Turrets	Cupolas
	Domes	Gutters
	Spandrels	

Suggested Weights of Leadtex

Specify Leadtex in the same weights and temper ordinarily used for copper, denoting the weight of lead coating as follows:

All ..... shall be 16 oz. (or other weights) hard (or soft) copper base, Standard (or Heavy or Extra Heavy) (single or double face) Revere Leadtex.

Note: 16 oz. copper is ordinarily sufficient for flashings, spandrels, roofing and other sheet metal work. Heavier gauges can be supplied where desired.

Leadtex Readily Obtainable by the Sheet Metal Trade

Leadtex is distributed throughout the country and is readily and quickly obtained by the sheet metal trade through authorized distributors of Revere products.

Samples and Architectural Service

Samples of Leadtex in its various finishes will be gladly sent to any architect.

We will also be very glad to assist architects with any problem they may have in regard to special details or application which may arise. Our nearest office will answer any communications in regard to Leadtex and its uses.

THE O. S. STEWART COMPANY

Manufacturers of Stewart Rustproof Cast Aluminum and Iron Downspout Protectors and Conductor Boots for Sewers

OFFICE AND FACTORY
887 East 67th Street
CLEVELAND, OHIO

LEADING ARCHITECTS AND ENGINEERS SPECIFY STEWART RUSTPROOF DOWNSPOUT PROTECTORS FOR ALL BUILDINGS OF DISTINCTION

Economical

When copper conductor pipes are used with Stewart Rustproof Cast Metal Protectors it is a most *economical and permanent installation.*

Advantages

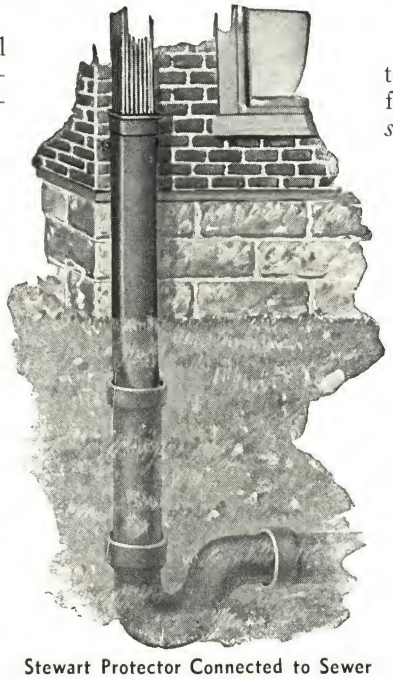
In order to provide against destruction due to corrosive influences and from colliding lawn mowers, ash cans, and like objects it is essential that all outside leaders be of strong substantial section for a sufficient distance above and below grade.

Downspouts are exposed to the most destructive natural elements. Below ground the metal is continuously damp with oxygen which presents a perfect condition for corrosion. Above the line of contact with the earth it is alternately wet and dry in accordance with the weather. Stewart Rustproof Cast Metal Downspout Protectors for sewers and downspouts are made of extra heavy cast aluminum. Aluminum under such conditions is substantially uncorrodable. It is unaffected by rainwater, dampness or to continuous exposure to the elements. It is ductile and strong. The fact that its weight is only one-third that of iron results in a substantial saving in the cost of shipping.

Typical Stewart Protector Installation on Residence

Construction

Stewart Rustproof Cast Metal Downspout Protectors for sewers and downspouts are made with ears and guides to be fastened to the building by means of expansion bolts or lag screws. When anchored to the building they set plumb to the wall and are neat and add much to the appearance of the building. They are made to fit all standard sizes of conductor pipes.



Stewart Protector Connected to Sewer

Do not have conductor pipes come in contact with damp ground. That is what causes them to rust away

An example of downspout that can be protected by the use of a Stewart Rustproof Downspout Protector which will also improve appearance of the building

Notice in the above how neat the Stewart Rustproof Downspout Protector hub fits the conductor pipe

Guaranteed

Stewart Rustproof Downspout Protectors are guaranteed and are noted for *appearance, durability, quality and strength.*

Uses

The hub of the protector is installed above the grade line. It protects both the sewer and downspout and thus eliminates the 80% of sewer stoppages caused by broken sewer pipes and rusted conductor pipes at the grade line, and the washing of sand directly into the traps.

The short protector may be used around residences where there is danger of breaking from lawn mowers, etc. The long protector should be used in driveways and around commercial buildings where there is danger of vehicles coming in contact with the downspouts.

Public Building Equipped with Stewart Protector

Specifications

The contractor shall furnish and install at the foot of each rain water conductor one Stewart Rustproof Downspout Protector of proper size to fit the downspout and to connect with the sewer 6 in. below the grade line. Each protector shall be set plumb with the building and securely anchored to the same. All joints shall be properly cemented or calked.

Do not let crock sewer pipe stick up above the ground. It not only spoils the appearance of your building, but nine out of ten are broken by lawn mowers, etc., causing stopped sewers and damp basements.

If your jobber does not carry Stewart Rustproof Downspout Protectors write to us.

4X5"
4X4"
3X4"
4"
6"
6X6"
4X6"
END VIEW
6"
4X5"
4X5"
4X5"
5"
SIDE VIEW
6"
6"
6"
4"
5"
5"
3X4"
4X5"
2
6"
3X4"
2X3"
3"
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WHEELING METAL & MFG. CO.

Manufacturers of "Leadclad" Roofing Materials and Accessories

HOME OFFICE

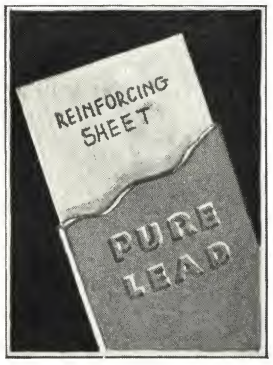
WHEELING, W. VA.

The LEADCLAD PROCESS

REG. U.S. PAT. OFFICE

For centuries lead has been recognized as the one metal available in commercial quantities which would successfully withstand the destructive forces of time and the elements. That the ancients knew and utilized the advantages of lead is proven by the many classic examples of architectural art which have been preserved for us through their leaden roofs.

The Pantheon at Rome is perhaps the oldest, although many other notable examples include St. Mark's Cathedral at Venice, St. Paul's at London and the Paris Opera.



The roofs of these buildings consist of slabs of solid lead, the only form obtainable in that day, which afford the combined requirements of protections and tensile strength. Science has pointed out the fact, however, that lead's protection is provided, not by the thickness of the metal, but by the surface film of carbonate acquired when exposed to the weather. Thus the thick, heavy body is proved wholly unnecessary for protection. For example, St. Paul's Cathedral was roofed with thick slabs of lead several centuries ago. Recent inspection shows that on the steep sections of this roof, the great weight of these slabs has caused a gradual downward flow of the lead so that today the bottom of the slab is much thicker than originally, while the top is thinner, but with all the surface protection intact. If the entire roof could have been of light, thin sheets the same centuries of protection would have been assured and a great economy would have been effected.

Adapting Lead to Modern Requirements

Despite the disadvantages of excessive weight and lack of tensile strength the recognized durability of lead resulted in repeated efforts to adapt its protection to modern needs. Alloys with other metals, while affording protection, did not eliminate the major disadvantages of excessive weight and expense, and it was recognized that the ideal method would be to use some light, strong metal such as steel or copper as a core, encasing it completely in pure lead and fusing the two metals to avoid separation. Working on this theory, numerous attempts were made to produce such a product but it was not until 1912 that a perfect union of *pure lead* with a steel core was accomplished.

Leadclad an Exclusive Process

The discovery, in 1912, of the process of fusing known as "Leadclad" actually provided the only known method whereby steel and *pure lead* are joined without the use of alloys. In this process all electrolitic activity between the two metals is neutralized, forming a perfect bond. The result is a dense, smooth sheet of *pure lead*, reinforced for strength and rigidity, with a core of steel or copper. It provides all the rust resistance and durability of solid lead, yet eliminates entirely the disadvantages of excessive weight and cost.

Nothing But Lead to the Weather

Since the LEADCLAD process involves the use of no alloys, the resulting surface of *pure lead* insures every weather resisting advantage of the solid material. It is rustless, impervious to weather, unaffected by atmospheric conditions. It is not subject to excessive expansion and contraction eliminating the expansion joints necessary where solid metals are used.

A Proven Material

The salt-laden air of our seaboards, particularly disastrous to most metals, has left LEADCLAD materials wholly unaffected even through years of exposure, while in smoky or sulphurous atmospheres their resistance to corrosion has been proved through nearly a generation of use in the manufacturing districts of Pittsburgh, Cleveland, Cincinnati and other industrial centers.

Leadclad Products

LEADCLAD Flat Sheets, all standard gauges and sizes; LEADCLAD Formed Roofings, such as Corrugated, V-Crimp, Roll and Standing Seam; LEADCLAD Leader Heads, Conductor Pipe and Fittings; LEADCLAD Shingles, Spanish Tile, Sidings, Ceilings and Ridge Roll.

Also LEADCLAD Wire, barbed and woven; Highway Guard Cable and Strand; Corrugated Culverts and all accessories for above.

For LEADCLAD Ornamental and Protective Fences, see Manufacturers' Index.

Glendale LEADCLAD Copper fulfills the demand of architects for a finish which will eliminate the discoloration so frequent where copper alone is used. As the name indicates, it is standard copper sheets encased in a heavy coating of *pure lead.*

Glendale LEADCLAD REG. U.S. PAT. OFFICE COPPER

Advantages

The high excellence of Glendale LEADCLAD Copper is due to the method of manufacture under the exclusive LEADCLAD Process. This process actually fuses the *pure lead* jacket to the copper base. No flaking or peeling of the coating is possible. No tin, antimony or other metals are added. Only by the use of absolutely *pure lead* can be secured the proper density of coating and the natural lead color acquired through exposure to weather, and only by the LEADCLAD Process can absolutely *pure lead* be fused to copper. The *pure lead* coating of Glendale LEADCLAD Copper is unaffected by the acids in smoke laden or foggy air. This prevents the staining of stonework, a natural fault of plain copper. The same lead coating blends harmoniously with modern architecture, acquiring a beautiful stone-like appearance with the passage of time.

Uses

Glendale LEADCLAD Copper is made in flat sheets for roofing, in five standard weights of coating and two finishes. These sheets are especially adaptable for cornice, spandrels, domes, spires and decorative metal work.

Glendale LEADCLAD Copper fabricated products include Leader Heads, Leaders, Gutters and all Accessories.

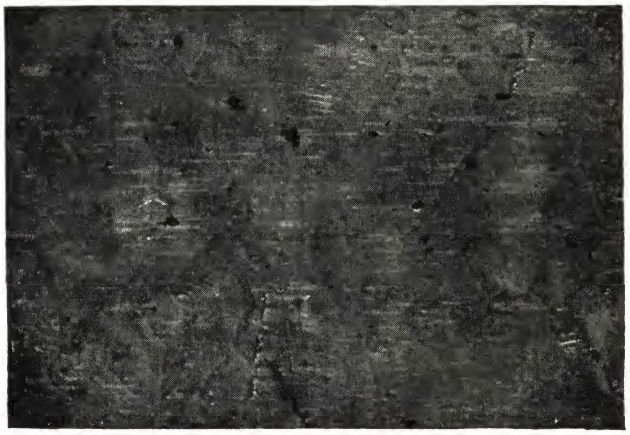
English Cast Finish

Weight

The LEADCLAD Process adds weight and strength to plain copper. When specifying it is well to remember that 14 oz. LEADCLAD Copper is equal in weight and strength to 16 oz. uncoated copper, our standard coating adding 2 to 2½ oz. to the finished weight.

Finishes

Glendale LEADCLAD Copper is furnished in two popular finishes. A smooth gray for general sheet metal work and an English Cast Finish of roughened, antique effect, for use where texture is important. Both are available in all weights and sizes.



Smooth Finish

Description of Finishes

Light—Glendale LEADCLAD "Light", coated with approximately 6 to 8 lbs. per 100 sq. ft. on *both* sides of the sheet (3 to 4 lbs. per side).

Standard—Glendale LEADCLAD "Standard", coated with approximately 12 to 15 lbs. per 100 sq. ft. on *both* sides of the sheet (6 to 7½ lbs. per side).

Heavy—Glendale LEADCLAD "Heavy", coated with approximately 25 to 30 lbs. per 100 sq. ft. applied on *both* sides of the sheet (12½ to 15 lbs. per side).

Extra Heavy—Glendale LEADCLAD "Extra Heavy", coated with approximately 40 to 50 lbs. per 100 sq. ft. applied on *both* sides of the sheet (20 to 25 lbs. per side).

Old English—Glendale LEADCLAD "Old English", semi-rough finish on one side of sheet, other side smooth. Approximately 22 lbs. on rough side, 6 lbs. on smooth side.

LEADCLAD STOCKS IN THESE CITIES

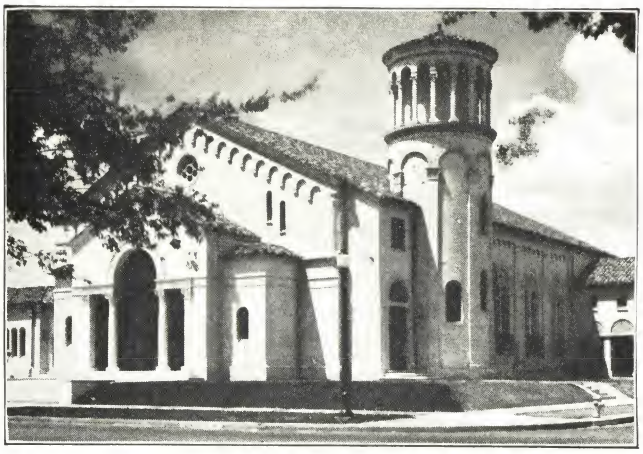
ATLANTA, GA., CHAS. N. WALKER ROOFING CO., 141-3 Houston St., N. E.
BALTIMORE, MD., KAHL-HOLT CO., 111 South Charles St.
BIRMINGHAM, ALA., MANN & NUSS, 2313-15 Fifth Ave., So.
BOSTON, MASS., HERRICK & CO., 47-49 Broad St.
BRIDGEPORT, CONN., PARSONS BROS., 25 E. Washington Ave.
CHATTANOOGA, TENN., TOM SNOW HEATING & ROOFING CO.
CINCINNATI, OHIO, MAXIMENT COMPANY, 615 Carr St.
CLEVELAND, OHIO, J. KINSNER & SON CO., 8710 Blaine Ave.
DALLAS, TEX., NEW PROCESS ROOFING CO., 802-10 Cadiz St.
DENVER, COLO., BUILDING PRODUCTS CORP., 143 Welton St.
DETROIT, MICH., W. J. BURTON CO., 5670 Federal Ave.
ERIE, PA., GUS KRACK & SON CO., 1018 W. 18th St.
HOUSTON, TEX., GENERAL SUPPLY CO., M & M Building
INDIANAPOLIS, IND., TANNER & COMPANY
KNOXVILLE, TENN., HICKS SHEET METAL WORKS, 1204 Grand Ave.
LOS ANGELES, CAL., H. E. MCGOWAN CO., 2464 Enterprise St.
MANSFIELD, OHIO, E. C. LEISY ROOFING CO., 115 Stocking Ave.
MOBILE, ALA., AMERICAN ROOFING & CORNICE WORKS, 7 Conti Ct.
MONTGOMERY, ALA., J. L. WHITE ROOFING CO., 209-11 Bell St.
MUSKOGEE, OKLA., STAR TIN SHOP & HEATING CO., 205 E. Broadway
NEW ORLEANS, LA., BLATTMAN-WEISER CO., 1001-1025 Tanlance St.
NEW YORK, N. Y., KATZMAN & STROBER, 1182 Flushing Ave., Brooklyn, N. Y.
NORRISTOWN, PA., ASBESTOS INSULATING CO., Astor and Main Sts.
PORTLAND, ORE., GEO. L. CHERRY, 201 Worcester Bldg.
RICHMOND, VA., VICTORIA METAL COMPANY
ST. LOUIS, MO., AALCO FURNACE & SUPPLY CO., 405 So. Sarah St.
SAN ANTONIO, TEX., PARKER SHEET METAL CO. INC., 945 Ashby Pl.
SAN FRANCISCO, CAL., CARTER SPECIALTIES CO., 506 Sharon Bldg.
SEATTLE, WASH., CUMMINGS-JOHNSON CO., 1913 Fourth Ave.
TOLEDO, OHIO, FRED CHRISTEN & SON, 714-726 George St.
WASHINGTON, D. C., FRIES, BEALL & SHARP, 734-736 Tenth St., N. W.
YOUNGSTOWN, OHIO, DALZELL-MCCLASKEY CO., 928-940 W. Haven Ave.

GLENDALE LEADCLAD COPPER (Continued)

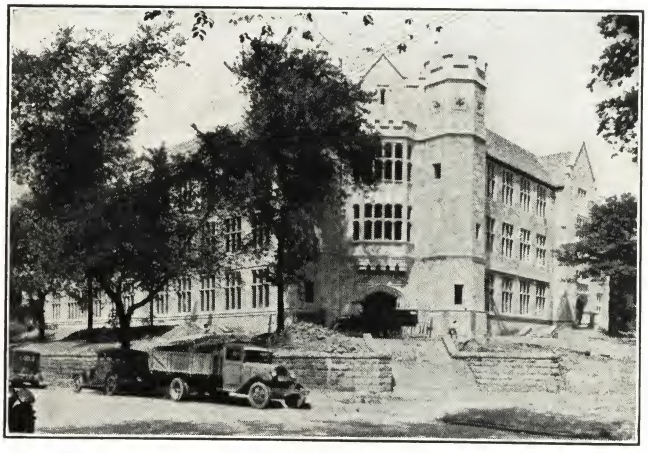
Architects have found in Glendale LEADCLAD Copper everything that could be asked of a sheet metal. Here in one material is combined permanence, adaptability, beauty in color and texture, at a comparatively low cost.

Glendale LEADCLAD Copper lends itself to practically any architectural design. Its surface, being *pure lead*, resists discoloration entirely. It weathers to a soft stone gray and harmonizes perfectly with its surroundings.

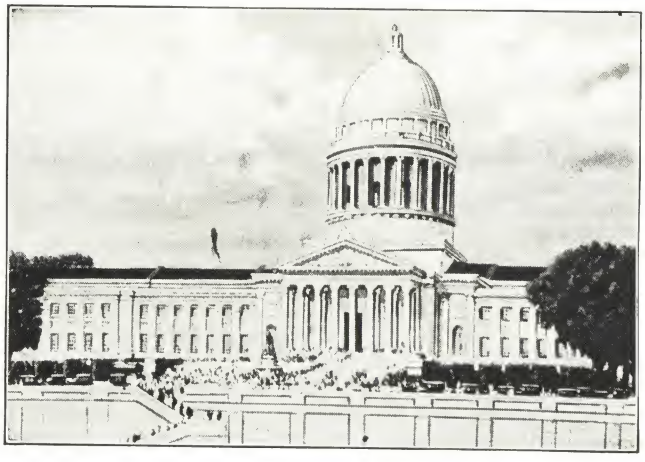
Phillips Hall Dormitory, Bethany College, Bethany, W. Va.
THAYER & SON, Architects, New Castle, Pa.
H. C. SMITH CO., Contractors, McKeesport, Pa.



Church of Christ, Scientist, Dallas, Texas
MARK LEMMON, Architect, Dallas, Texas



Youngstown Y. M. C. A. Schools, Youngstown, Ohio
PAUL BOUCHERLE, Architect
THE GERRITY-PARISH CO., General Contractors
THE DALZELL-MCCLASKEY CO., Sheet Metal Contractors



West Virginia State Capitol, Charleston, W. Va.
CASS GILBERT, Architect, New York, N. Y.
GEO. A. FULLER, INC., General Contractors, New York, N. Y.
E. VAN NOORDEN CO., Sheet Metal Contractors, Boston, Mass.

Specifying Glendale Leadclad Copper

In specifying Glendale LEADCLAD Copper it is suggested that the recommendations of the Copper and Brass Research Association be followed except that the specification should state that copper is to be coated with *pure lead*, the coating to contain no tin, antimony or other metal. Where permissible, a specification by name will insure against substitution.

ADDITIONAL LEADCLAD COPPER INSTALLATIONS

CITY	INSTALLATION	ARCHITECT
White Plains, N. Y.	Bloomingdale Hospital	Grosvenor Atterbury
Washington, Pa.	Edw. J. Markey Residence	Wm. M. Burke
Scarborough, N. Y.	J. B. Clemmons Residence	Chas. E. Birge
New York, N. Y.	No. 2 Beekman Place	Rosario Candela
Manasquan, N. J.	Manasquan High School	Coffin & Coffin
Huntsville, Pa.	Miss Jessie Thomas Sturdevant Estate	Clark Wright Evans
Grove City, Pa.	Grove City College	W. G. Eckles
Chestertown, Md.	Farm Group	Christian F. Rosborg
Katonah Town, N. Y.	Tennis Shelter and Farm Group	Christian F. Rosborg
Columbus, Ohio	Botany and Zoology Building, Ohio State University	Howard Dwight Smith
North Abbington, Pa.	Worthington Scranton Residence	Marion Simms Wyeth and Frederic Rhinlander King

LEADCLAD
REG. U.S. PAT. OFFICE
STEEL

Light, strong, rustless, impervious to acid and fume conditions, LEADCLAD Steel offers the architect or engineer a material unusually well adapted to long life and low upkeep cost. As its name implies, it is a sheet of carefully selected copper-bearing steel, wholly encased in an armor of *pure lead*. Thus it provides all the durability of solid lead, plus the advantages of lightness, rigidity, ductility and low cost. Unpainted, it will, under normal conditions, afford generations of protection, while with occasional painting, it becomes practically everlasting. Available in the forms listed at the bottom of our first page. LEADCLAD Steel has, for the better part of a generation, found favor with architects where the issue of permanence at low cost had to be met.

Standing Seam Roofs

Of the many forms in which LEADCLAD Steel is applicable for roofing, the standing seam or rib type occupies a place of unquestioned importance. LEADCLAD Steel brings to this type not only the easy workability of other metals, but its high resistance to corrosion has proved it a most economical material.

Flat Seam Roofs

For the roof or deck where a flat seam is required, LEADCLAD Steel affords a stormtight, waterproof seam. The *pure lead* surface not only insures generations of protection but, since LEADCLAD Steel is not subject to excessive expansion and contraction, the possibility of leaky seams (where the job is well done) is reduced to a minimum.

Data on Specifying Leadclad Products

Since each type of roof requires different specifications, and the variety of LEADCLAD Products is so wide, it is thought advisable here to present a general specification only, not attempting to cover all types and conditions which might be encountered in actual practice.

All roof surfaces of this building shall be covered with LEADCLAD [Steel] or [Copper] as manufactured by the WHEELING METAL & MFG. Co., Wheeling, W. Va. No substitute for the above shall be permitted. LEADCLAD [Steel] or [Copper] shall be laid over first grade waterproof paper. (Paper saturated with tar or other chemicals should be avoided as the heavy acids, when confined under the roof are sometimes injurious.) Roofers shall wear rubber shoes and no unnecessary walking over the roof or using the same for storage of other material shall be allowed., All workmanship shall be guaranteed for one year.

RECOMMENDED GAUGES OF LEADCLAD (STEEL BASE)

	Residence	Public buildings	Industrial plants
Roofing	26 to 29	24 to 28	18 to 28
Siding	26 to 29	24 to 28	18 to 28
Skylights	24 to 30	20 to 26	20 to 26
Cornices	24 to 28	22 to 28	22 to 26
Ventilators	24 to 28	18 to 26	18 to 26
Conductor	24 to 29	24 to 29	24 to 28
Eaves trough	24 to 28	24 to 28	24 to 26
Ridge roll	26 to 29	26 to 29	18 to 28
Valleys	24 to 29	24 to 28	18 to 28
Flashing	28 to 30	26 to 29	24 to 28

APPROXIMATE THICKNESS AND WEIGHT OF LEADCLAD (STEEL BASE)

Gauge No.	Weight per sq. ft. in lb.	Approximate thickness, in.	Approximate thickness in decimal parts of an in.	Gauge No.	Weight per sq. ft. in lb.	Approximate thickness, in.	Approximate thickness in decimal parts of an in.
30	.76	1/64	.016	24	1.25	1/32	.031
29	.82	3/160	.019	22	1.50	3/80	.036
28	.88	7/320	.021	20	1.96	7/160	.041
26	1.00	1/40	.026	18	2.25	9/160	.54

Specifications should indicate the required gauge and grade of LEADCLAD as shown in the table herewith.

In addition, the architect should include such data as would be required by local conditions and the particular job. Such items will include the preparation of surfaces, weight, lap and nailing of paper or felt; spacing of battens, etc., under carpenter's work; prevention of damage to roof during construction; cleaning of roof after completion and water testing where this is deemed necessary; provision for scaffolding or rigging, hoisting, and similar items dictated by local requirements.

In general it may be stated that LEADCLAD Steel or LEADCLAD Copper may be quickly and readily applied under the usual specification for any sheet metal.

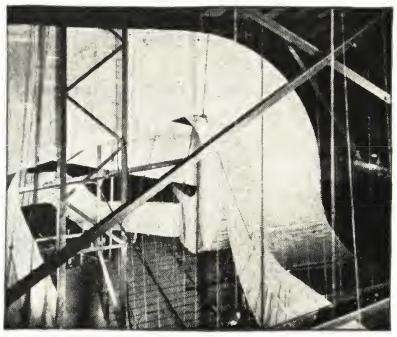
LEADCLAD STEEL INSTALLATIONS

CITY	INSTALLATION	ARCHITECT
Middlebury, Va.	Whitney Stables	Wm. J. Creighton
New York, N. Y.	New York Cornell Medical Center	Coolidge, Shepley, Bulfinch & Abbott
Langley Field, Va.	Paint, Oil and Dope House	Office Q. M. General, War Department
Bristol, Va.	Virginia Intermont College	Clarence B. Kearfott
Cleveland, Ohio	William Telling Residence	John Sherwood Kelly
Erie, Pa.	Lawrence Park School	Cody & Kirby
Erie, Pa.	Central School	Meyer & Johnson
Sandusky, Ohio	Webster Service Station	Harold Parker
Cincinnati, Ohio	Joseph G. Steinkamp Residence	Joseph G. Steinkamp
Rosser, Texas	Valley Farm	Southwestern Engineering Company
Southampton, N. Y.	Playhouse Estate of J. D. Maguire	C. W. Short
Cooperstown, N. Y.	Alfred Corning Clark Gymnasium	Frank P. Whiting
Lloyds Neck, L. I., N. Y.	Robert P. McKay Residence	Burrall, Murray & Hoffman
Various	Paramount Theatres (Ventilating ducts)	G. B. Buchanan

LEADCLAD MINIMIZES NOISE TRANSMISSION IN AIR DUCTS

The growing use of air conditioning in public buildings has directed architects' attention to LEADCLAD from an entirely new angle. One of the difficulties encountered in air ducts has been the tendency to amplify and transmit annoying sound, due to the vibration of the hard coated metal ordinarily used.

In addition to the immunity of LEADCLAD to corrosion and fume conditions, it has been discovered that the *pure lead* coating, softer than zinc or other coating, assists in absorbing sound and minimizing the transmission of noise to other parts of the building.



For this reason a number of architects and engineers choosing sheet metal for ventilating and air conditioning systems are specifying LEADCLAD. They have found this advantage particularly useful in theatrical work since the advent of the talking picture which creates a condition not heretofore met in theatrical design.

One of the large theatre chains, after conclusive tests, now specify LEADCLAD exclusively for this work.

HAND-DIPPED ROOF DRAINAGE PRODUCTS

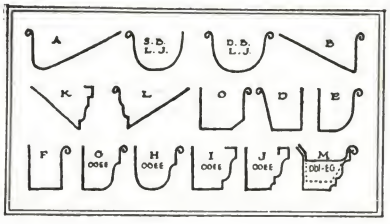
The beautiful, non-staining, natural gray color of LEADCLAD products enhances the appearance of any structure. The time defying qualities of LEADCLAD are particularly valuable in gutters, flashing, conductor and other points where concentration of roof drainage accelerates wear.

LEADCLAD
REG. U.S. PAT. OFFICE

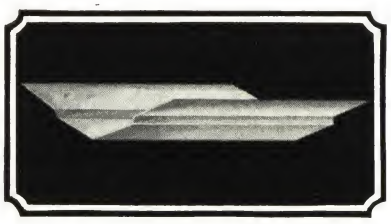
Redipped by the Old Hand Process

LEADCLAD is available in a variety of formed products, all recoated after forming by the old hand-dipping process. This insures an extra heavy coating of lead on all surfaces and seals all seams.

Gutters

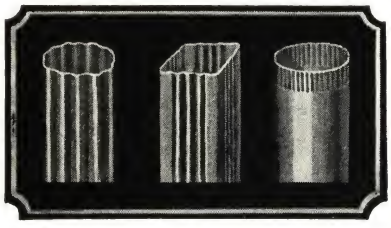


Hand-dipped LEADCLAD and Glendale LEADCLAD Copper Gutters are furnished in box, pole and hanging types. The profile shows the designs of box and hanging gutters always available from stock. Special shapes to order. The soft stone color of LEADCLAD makes it blend well with many types of architecture, particularly those of masonry construction.



Valleys

For the various types of valley commonly formed on the job, standard size sheets of LEADCLAD and Glendale LEADCLAD Copper will be found highly satisfactory for ease of working and durability. Where time and labor are at a premium, factory formed valleys of either metal will effect a substantial saving. They are offered in several styles (one of which is illustrated) and assure the architect a dependable material for use with slate, tile, asbestos, wood and metal roofing. Put up in 10-ft. lengths and available in 18, 20, 22, 24, 26, 28 and 29 gauge.

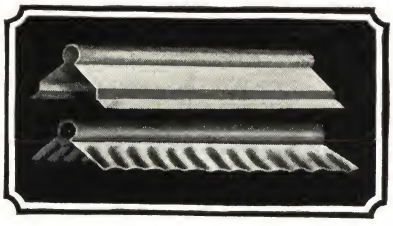


Conductor

Supplied in LEADCLAD and Glendale LEADCLAD Copper in plain round, round corrugated, plain square, square corrugated and polygon shapes. Special styles furnished in any gauge and diameter.

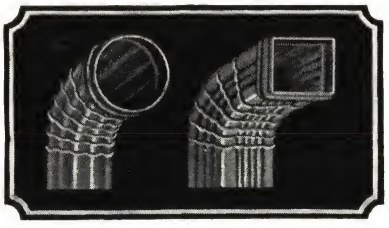
Ridge Rolls

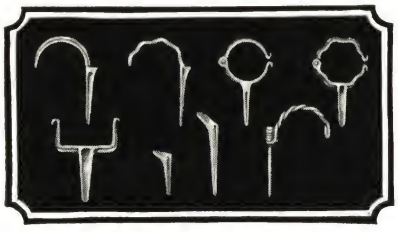
Made in LEADCLAD and Glendale LEADCLAD Copper. Put up in 10-ft. lengths. Available in 18, 20, 22, 24, 26, 28 and 29 gauge. Corrugated and plain ridge with nailing flange are illustrated.



Elbows and Shoes

In all standard sizes and angles. Made in LEADCLAD and Glendale LEADCLAD Copper. Special sizes promptly to order.

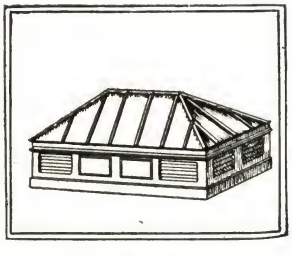




Accessories

A complete line of hangers and straps in both standard and ornamental styles are made for LEADCLAD drainage products. Made of wire, malleable iron, steel or copper, coated with pure lead after forming.

LEADCLAD FOR OTHER PRODUCTS

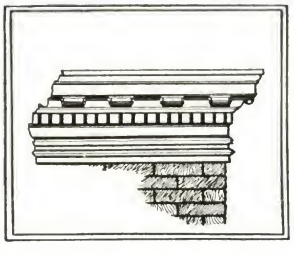


Skylights

A durable, long-lasting metal, resistive to acid fumes is essential in skylight construction. All too often have skylight leaks been the cause of extensive water damage. When formed of LEADCLAD or Glendale LEADCLAD Copper danger of rust is eliminated and a more permanent structure is assured.

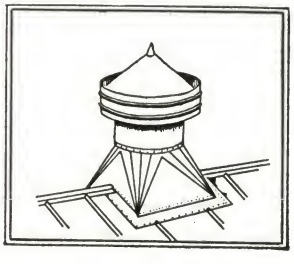
Cornices

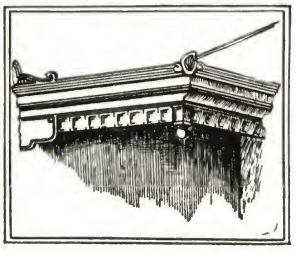
Five factors contribute to the popularity of LEADCLAD for cornice work. First, strength; second, lightness and ease of handling; third, durability, due to its heavy lead jacket; fourth, ductility; fifth, the harmony of the natural soft gray color with the better types of architecture.



Ventilators

Any type or style of ventilator can readily be formed from LEADCLAD or Glendale LEADCLAD Copper. This is especially important for ventilators in industrial plants where acid fumes must be carried off. Fumes which attack even the best of unprotected metals have little or no effect upon the acid-resisting surface of LEADCLAD.





Marquises

Usually, highly ornamental, marquises present a severe test for any metal. LEADCLAD is easily worked and the architect's design can be accurately reproduced without difficulty. Furthermore, LEADCLAD soon takes on a beautiful soft, gray stone-like patina and requires no acid treatment or painting to maintain its appearance.

LEADCLAD LEADER HEADS

Just as the cast or hand wrought lead leader heads were an essential part of the Early English manor house, so modern LEADCLAD leader heads lend a touch of authenticity to American adaptations of English style. LEADCLAD leader heads duplicate faithfully the style, color and texture of some of the most outstanding Early English examples. The same Pure Lead protects them from the elements, protects the building from staining and discoloration, and acquires the beautiful stone-like patina natural to lead.

LEADCLAD leader heads, due to their method of manufacture, are much stronger, infinitely lighter in weight and are available at but a fraction of the cost of cast or wrought lead heads. Hand made, by master craftsmen, of one-piece welded construction, the steel or copper core of LEADCLAD leader heads is sealed permanently against rust and corrosion by the LEADCLAD Process.

The LEADCLAD Process applies an extra thick coating of *pure lead* to both interior and exterior surfaces. This coating is absolutely *pure lead,* no tin, antimony or other metals added.

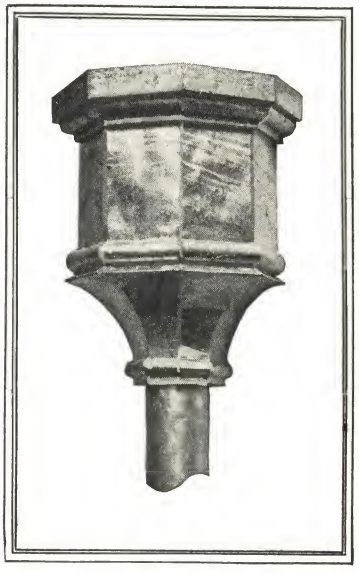
In addition to the regular series pictured below, special designs can be produced from the architect's drawings.

Exeter

Weight 14½ lbs. Width 14½ ins.
Height 25½ ins. Depth 9 ins.

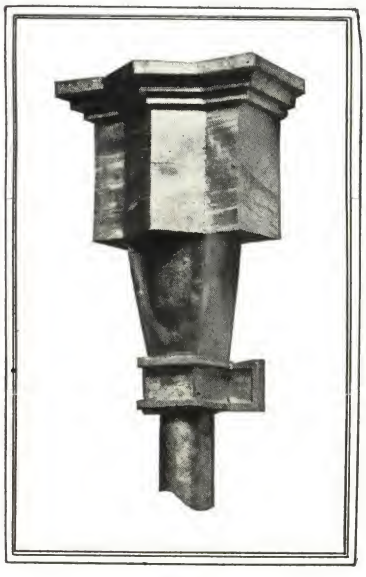
Bristol

Weight 24 lbs. Width 17 ins.
Height 36 ins. Depth 10½ ins.



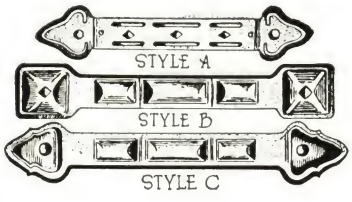
Norwich

Weight 15½ lbs. Width 18 ins.
Height 25½ ins. Depth 12 ins.



York

Weight 17 lbs. Width 18 ins.
Height 31 ins. Depth 8½ ins.



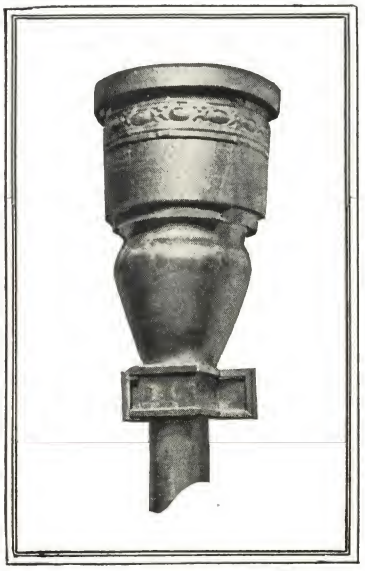
Straps

Style "A" for 2 x 3-in. and 3 x 4-in. square conductor. Can also be used for 3 and 4-in. round conductors.

Style "B" for 2 x 3-in. and 3 x 4-in. square conductor.

Style "C" for 2 x 3-in. and 3 x 4-in. square conductor.

One-piece construction, of LEADCLAD Steel or LEADCLAD Copper in both English cast and smooth finishes. Shipped flat, to be bent and formed by hand on the job.



Carlisle

Weight 15 lbs. Width 14 ins.
Height 30 ins. Depth 8½ ins.

ESTABLISHED 1860

HETZEL ROOFING PRODUCTS CO.

Manufacturers of Roofing Cements and Paints

67 Maine Street, NEWARK, N. J.

CABLE ADDRESS
"Hetzel, Newark"

Products

HETZEL'S ELASTIC ROOF CEMENT for all roofs, glass skylights, coping stones, etc.

HETZEL'S INSULATION CEMENT, "ACOUSTIGLU."

HETZEL'S PLASTIC ROOF COMPOUND and FIBROUS KOTING.

HETZEL'S ELASTIC CALKING COMPOUND.

HETZEL'S PIPE JOINT COMPOUND.

HETZEL'S DAMP RESISTING PAINT for brick walls.

Also Hetzel's Asphalt Paints; Hetzel's "Rub-on" Roofing Paint; Hetzel's Enamel Paint for boiler fronts and steam pipes; Hetzel's Acidproof Paint for metal work, ammonia tanks and gas tanks; Hetzel's Structural Paint for exposed surfaces.

TRADE-MARK

Hetzel's Elastic Roof Cement

Hetzel's elastic roof cement, in use throughout the United States and Europe for many years, is especially valuable for covering and repairing all holes, cracked joints, breaks, or leaks in roofs of all kinds. Used also for pointing around chimneys, skylights, and dormer windows; for repairing coping stones, gutters, wood and stone work which require to be made watertight; for laying and bedding slate and tile roofs.

Asphalt shingles laid in Hetzel's cement will not curl, nor can snow or rain blow under them.

Colors: brown, gray, black, white, green and red. It is also made to order to suit every purpose, and is the only slaters', tinners' and tile roofers' cement.

Hetzel's elastic roof cement is equally well adapted for use on slate, tin, asbestos, glass, wood and metal roofs; is permanent; does not run or loosen from joints or cracks, and is not affected by any extreme of temperature or climatic changes. It does not harden, but preserves its complete elasticity even when exposed to extreme heat, cold, dryness or humidity.

Hetzel's Insulation Cement, "Acoustiglu"

For applying soundproofing and insulating materials to ceilings, floors, walls, oil and gas tanks, etc.

Ready for use—requiring no thinning or heating, nailing or shoring. Even alignment assured as material can be built down to proper level with Hetzel's Cement.

Hetzel's Plastic Roof Compound and Fibrous Koting (Liquid)

Specially prepared compounds for repairing and painting old wood, tin, iron or felt roofing; for repairing leaky chimneys; for waterproofing walls below and above grade, etc.

Hetzel's Elastic Calking Compound

For pointing window frames, hothouses, steel sashes, crevices, cracks in masonry, etc. Remains elastic indefinitely. Will not crack or dry up. Far superior to lead or oakum. Does not contain asphalt or coal tar. Can be painted over with any color. Also made in special consistency for use in guns.

Colors: white, gray, green, black, red and buff.

Pipe Joint Compound (Red, Gray and White)

For joints of gas, steam, water, and air pipes. Will not harden, and prevents joints from rusting. Makes absolutely tight joints which can be disconnected at any time without injury to fittings.

Hetzel's Damp Resisting Paint

A compound black paint for dampproofing foundations and walls above and below grade. When applied to inner side of exterior walls, forms a good dampproof surface for direct application of plaster, rendering plaster stainproof, and saving cost of furring and lathing.

Specifications Hetzel's Elastic Roof Cement

All nailholes and joints between the slates shall be sealed with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J., in such quantities as to hold the slates in position should they break, or the nails rust away. (Fig. 1.)

The joints of all tiles shall be sealed with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J. To prevent leaking, the hip and ridge rolls shall be sealed in a like manner. (Fig. 2.)

All cap flashings shall be carefully pointed up with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J. (Fig. 3.)

The joints of all copings shall be set and sealed with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J. (Fig. 4.)

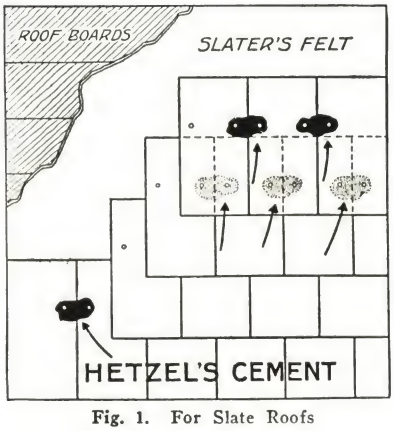


Fig. 1. For Slate Roofs

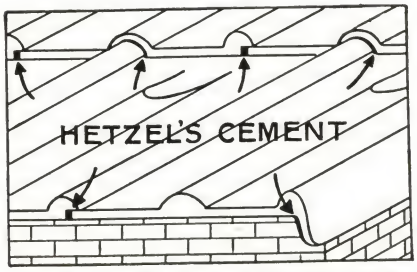


Fig. 2. For Spanish and Flat Tile Roofs

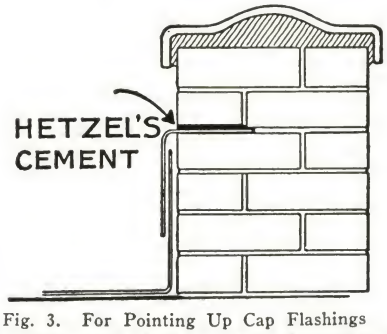


Fig. 3. For Pointing Up Cap Flashings

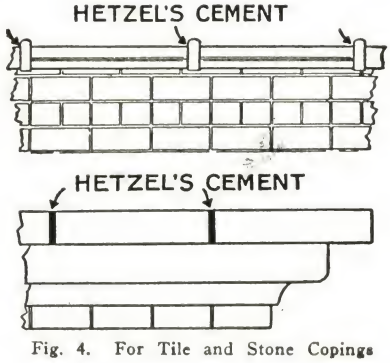


Fig. 4. For Tile and Stone Copings

Applications of Hetzel's Elastic Roof Cement

AMERICAN BAR LOCK CO., INC.

Bar Lock Alglas Skylights for Skylight and Roof Light Construction

36-30 Thirty-eighth Street
LONG ISLAND CITY, N. Y.

BRANCH OFFICES OR REPRESENTATIVES IN PRINCIPAL CITIES

For Bar Lock Sidewalk Lights, see Manufacturers' Index

BAR LOCK ALGLAS SKYLIGHTS

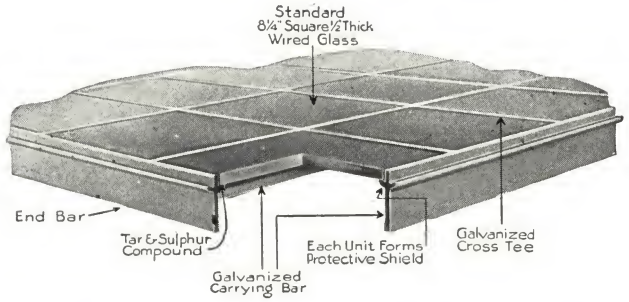
Bar Lock Alglas Roof or Skylight consists of a frame of galvanized rolled steel sections supporting ½ in. thick wire glass 8¼ ins. square.

Maximum Light Penetration

The Bar Lock Alglas construction with its steel supporting ribs has a much greater percentage of glass area than panels of equal size using concrete ribs of equal strength. The depth of the steel ribs being considerably less than those of concrete also reduces proportionately the area of shadow. The glass area is over 90%.

Use of Alglas Skylights

Alglas lights are suitable for any location where a skylight could be utilized to advantage but they are especially designed for roof terraces, balconies or other locations where the roof areas are intended to be used as terraces, promenades or play grounds. Not only can Bar Lock Skylights be used in these latter locations but they can be used in many others where an ordinary skylight would be impracticable due to the ease with which it can be burglarized or to its lack of strength and rigidity.



Construction of Alglas Skylights

Bar Lock Alglas Skylights are constructed of wired glass inserts 8¼ ins. square by ½ in. thick, supported in a frame fabricated from specially rolled steel sections spaced 8⅝ in. each way. The outside bars together with those running in the span direction have a depth of 2½ in. to provide rigidity and strength while those running transversely are 13/16 in. in depth. Both bars are especially rolled. The top portion of the webs form a protective shield around every glass.

Strength and Rigidity

Bar Lock Alglas Skylight construction has sufficient strength and rigidity to support a load of not less than 125 lbs. per sq. ft. over an unsupported span of 8 ft. Increased load intensities can be supported over shorter spans.

Galvanizing Insures Durability

After the entire frame has been completely fabricated and welded, it is pickled and dipped into a bath of molten spelter and provided with a heavy coating of zinc which completely covers every part or portion of the frame.

Glass Easily Placed and Replaced

The glass is protected on its sides by the central web of the steel ribs which extend to the top of the glass. Glass is fixed into place by filling the space between the steel and the glass with Bar Lock Glazing Compound which makes a completely watertight joint and at the same time is elastic enough to allow for the expansion and contraction of the glass with the changes in temperature. If through carelessness or abuse any light of glass should become broken it can be easily replaced by unskilled labor without affecting in any way any of the other lights.

Tested Glass Lights

All Bar Lock Glass lights are properly annealed and tested, to eliminate internal stress or other imperfections or defects which is the cause of cracking and chipping. Glass lights are 8¼ ins. square, are ½ in. thick and have an embedded wire mesh.

Bar Lock Glazing Composition

All Bar Lock glass lights are sealed into the surrounding steel frame by a special mixture which has been developed for the purpose which during any extremes of weather or temperature maintains an impervious and elastic joint.

Expansion Joints

Where it is desired to have a roof light extend for a distance which is too great to be covered by a single panel, two or more panels may be joined together by an expansion joint which is formed by a continuous galvanized steel gutter channel being placed under the adjoining ribs and being bolted thereto by vertical bolts. The space between the adjoining ribs is caulked with oakum and Bar Lock Caulking Compound.

Erection

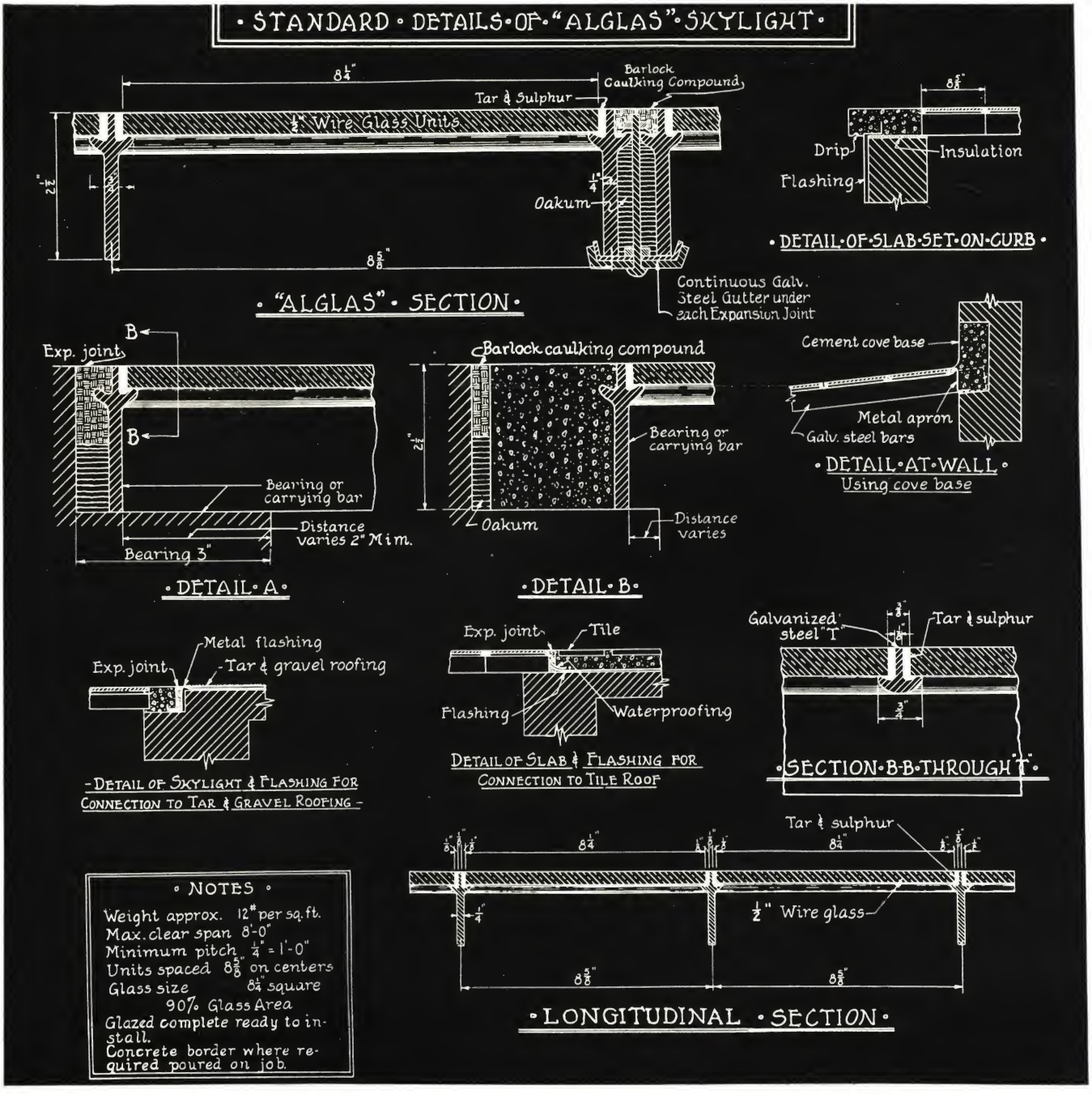
Ordinarily, Bar Lock Alglas Skylight slabs are crated and shipped to the building site to be set in place by the employees of the general contractor. Where desired, however, we shall be glad to furnish and install the construction by our own mechanics anywhere.

Bar Lock Alglas Skylights compete in price with other less desirable forms of construction. We will be glad to quote prices on the receipt of plans and specifications or of a list of the sizes required.

Bar Lock Reinforced Concrete Roof Light Slabs

We shall be glad to quote prices for the delivery only, or for the delivery and erection of our reinforced concrete roof light slabs, the quality of which has been the basis of our reputation in the past. Details furnished on request.

DETAILS OF BAR-LOCK ALGLAS SKYLIGHT CONSTRUCTION



Explanation of Alglas Details

The above drawing shows in complete detail the construction and installation of Alglas Skylight Construction. The Alglas Section at the top shows a section taken across the deep or load carrying ribs. At the right of the section is shown an expansion joint arranged between slab units. The bolted continuous galvanized steel channel forms a weatherproof joint which allows for expansion without subjecting the slabs to undue stress.

The detail of slab set on curb shows the method of flashing a slab set on top of curb surrounding a roof opening.

Detail "A" shows a section through the side of an Alglas skylight slab supported on concrete or masonry haunches where the Alglas slab and the roof surface are at the same level.

Detail "B" shows a section similar to Detail "A", except where a concrete border is required around the skylight it can be installed by us with an expansion joint between the border and roof proper.

The "Detail at Wall" shows a method for forming a connection between the Alglas slab and an intersecting wall. In this case the end of the Alglas slab will be placed in a recess or raglet which will be left in the wall at the time of construction. Subsequent to the setting of the Alglas slab the recess will be filled with concrete and the cove base will be finished in the form shown. A metal flashing or apron will be provided as shown.

Section B-B through T is the section BB as shown on Detail "A" taken through the shallow transverse bars.

Other sections and details on plate are self-explanatory.

SPECIFICATIONS FOR BAR LOCK ALGLAS SKYLIGHTS

Skylights shown on plan shall be Bar Lock Alglas, factory finished type as manufactured by the AMERICAN BAR LOCK CO., INC.

Glass shall be ½ in. thick wired, 8¼ ins. square, to conform with United States Government Standard Simplified Practice.

Glasses are to be spaced on 8⅝-in. centers to give a minimum 90% glass area.

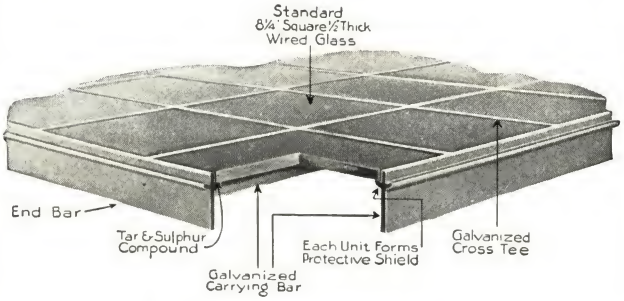
Galvanized frames shall be so constructed to form a protective shield around each glass. The space between the shield and the glass to be glazed with tar and sulphur compound to form an elastic watertight, weatherproof expansion cushion.

Bar Lock Alglas Skylight is easily installed by any contractor, but where desired they will be furnished and installed by our own mechanics anywhere.

A PARTIAL LIST OF RECENT ALGLAS INSTALLATIONS

BUILDING	LOCATION	ARCHITECT	BUILDING	LOCATION	ARCHITECT
Girard Trust Building	Philadelphia, Pa.	McKim, Mead & White	Albany Boys' Academy	Albany, N. Y.	Marcus T. Reynolds
Home for Needy Confederate Women	Richmond, Va.	Lee, Smith & Vandervoort	Nos. 54-58 E. 93rd St.	New York, N. Y.	Walker & Gillette
Fire Alarm Station	Michigan City, Ind.	John Lloyd Wright	Hotel Dempsey	Macon, Ga.	W. L. Stoddart
Hydro Electric Plant	Alloy, W. Va.	Ford, Bacon & Davis	Orrington School	Evanston, Ill.	Childs & Smith
First National Bank	Oklahoma City, Okla.	Weary & Alford	Apartment Building	Allentown, Pa.	Ruhe & Lange
St. Joseph's Orphanage	Richmond, Va.	Carneal, Johnston & Wright	Courthouse	Laramie, Wyoming	William Dubois & William A. Hitchcock
			Store Building	Montgomery, W. Va.	Montgomery & Paterson

Chanin Building, New York
SLOAN AND ROBERTSON, Architects



Bar Lock Alglas Skylight Section

Albany Boys Academy, Albany, N. Y.
MARCUS T. REYNOLDS, Architect

Girard Trust Co., Philadelphia, Pa.
MCKIM, MEAD AND WHITE, Architects

Trade Facilities Building, Brooklyn, N. Y.
RUSSELL G. CORY, Architect

Department of Commerce Building, Washington, D. C.
YORK AND SAWYER, Architects

AMERICAN 3 WAY-LUXFER PRISM CO.

Daylight Engineers

1301-1305 South 55th Court
CICERO, ILL.
(Suburb of Chicago)

55 West 42nd Street
NEW YORK, N. Y.

For our Sidewalk and Vault Lights, Transoms and Ventilators, see Manufacturers' Index

3-WAY DAYLIGHT ROOFING (GLASS GUARANTEED FOR 5 YEARS)

Construction—A roof light construction that is unsurpassed. Gives abundance of light, is fireproof, burglarproof, weatherproof (see details following page). Easily cleaned. Can be walked upon with safety. Designed and constructed for permanence and to eliminate maintenance costs.

A roof light that harmonizes with the architectural lines of the modern structure.

Glass is 8¼ in. square, standard ½-in. wired glass units, 9⅝-in. centers, sealed under special heat treatment with tar and sulphur into heavy cast iron hot galvanized treated shields, protecting the glass from expansion pressure and at the same time permitting easy and instant replacement without skilled help at any time it should be necessary.

Construction has a thickness of 3⅜ in. Weight approximately 30 lb. per sq. ft. (See details following page.)

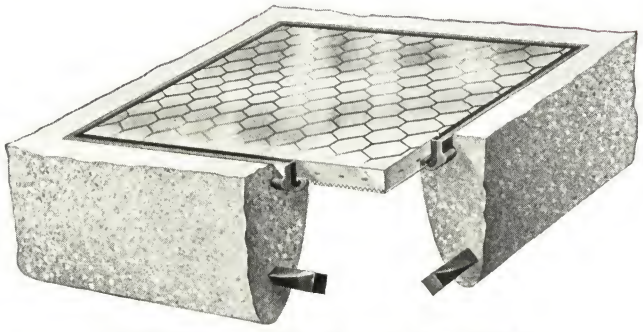
Can be furnished in factory finished slabs.

We recommend installation at building with our own mechanics.

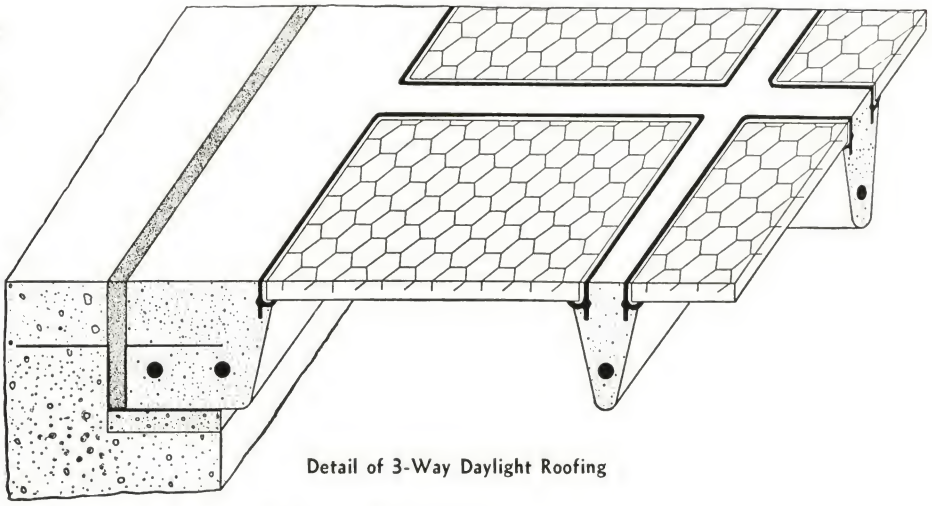
Specifications—Roof Lights where shown to be 3-Way Daylight Roofing Construction, 8¼-in. wire glass units of standard ½-in. wired glass, sealed in cast iron galvanized shields 9⅝-in. centers. Reinforced concrete construction; flashed as shown on plans [set up on curbs as shown on plans]; installed complete by manufacturer.

Glass for Replacement—To be supplied free of charge f.o.b. factory for a period of 5 years.

Use 3-Way Caulking Compound for filler in all joints.



Construction of 3-Way Armored Glass Skylight



Detail of 3-Way Daylight Roofing

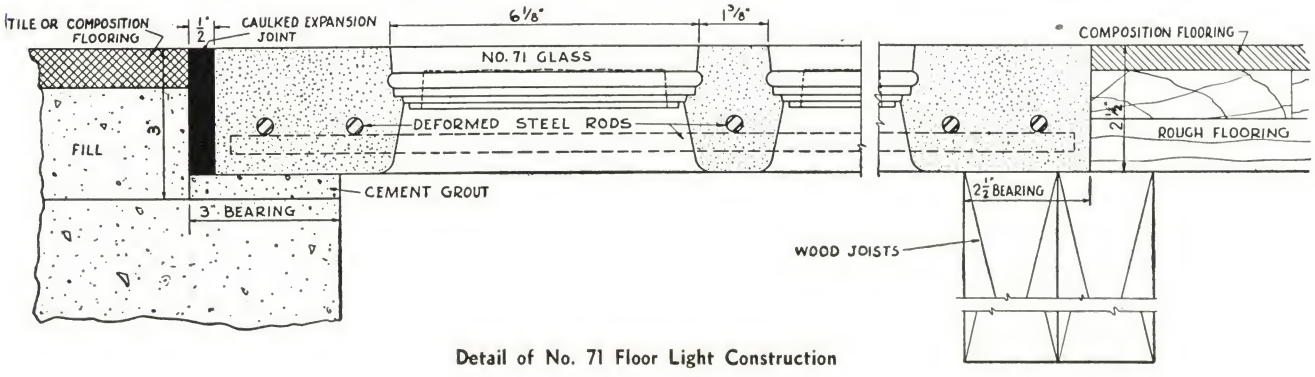
FLOOR LIGHTS

To light corridors, first floors, and the like, can be furnished and finished in color to match.

Glass either 4-in. square Fresnel design, 4¾-in. centers, or 6⅛-in. square, set 7½-in. centers.

Thickness of construction 2½ in.

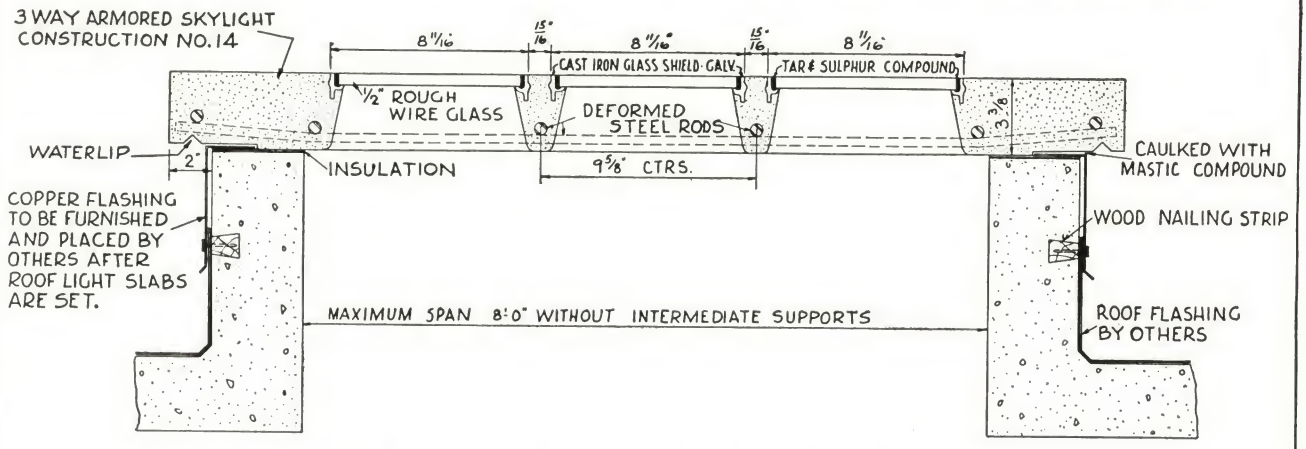
Weight, approximately, 25 lb. per sq. ft.



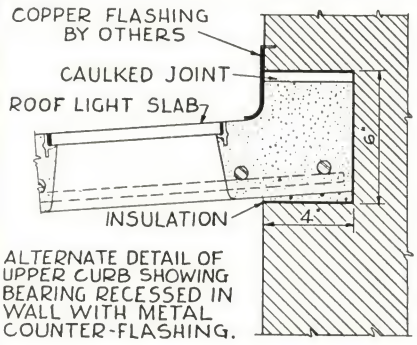
Detail of No. 71 Floor Light Construction

STANDARD DETAILS OF WATERPROOFING AND INSTALLATION METHODS FOR 3 WAY-LUXFER ARMORED GLASS CONSTRUCTION NO. 14 REINFORCED CONCRETE SKYLIGHTS-ROOF LIGHTS

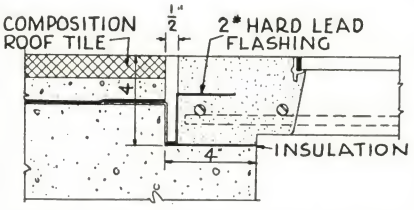
WEIGHT OF DAYLIGHT ROOFING - 30 LBS. PER SQ. FT.



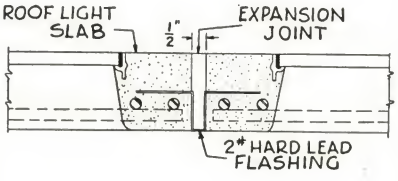
TYPICAL SECTION SHOWING BEARING ON CONCRETE CURBS WITH FLASHING AND COUNTER-FLASHING BY OTHERS



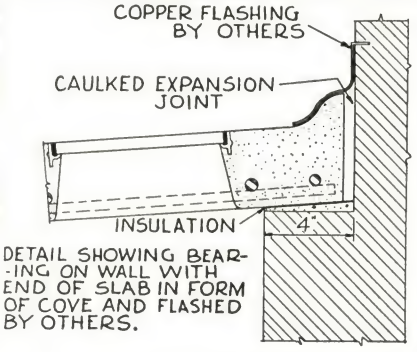
ALTERNATE DETAIL OF UPPER CURB SHOWING BEARING RECESSED IN WALL WITH METAL COUNTER-FLASHING.



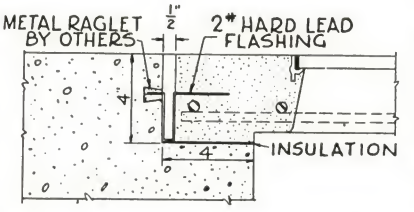
DETAIL SHOWING HARD LEAD FLASHING SET FIRST AND THEN WATER-PROOF-ING MEMBRANE MOPPED ON OVER HARD-LEAD FLASHING.



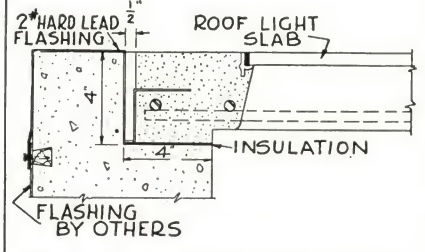
DETAIL THRU EXPANSION JOINT SHOWING HARD LEAD FLASHING AT JOINT BETWEEN TWO ROOF LIGHT SLABS.



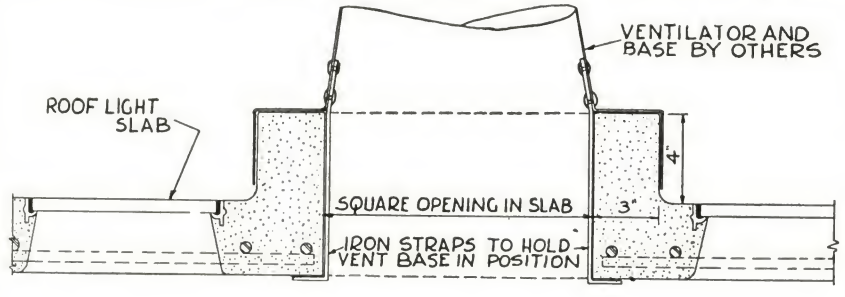
DETAIL SHOWING BEAR-ING ON WALL WITH END OF SLAB IN FORM OF COVE AND FLASHED BY OTHERS.



DETAIL SHOWING HARD LEAD FLASH-ING SECURED BY METAL RAGLET FURNISHED AND INSERTED BY OTHERS



DETAIL SHOW METHOD OF FLASHING ROOF LIGHT SLABS WHERE SLABS DO NOT EXTEND OVER TOP OF CURB.



DETAIL SHOWING CURB BUILT-UP IN ROOF LIGHT SLABS FOR VENTILATOR BASES.

3-WAY Daylight Roofing

AMERICAN
3 WAY-LUXFER PRISM CO.
CHICAGO CICERO, ILL. NEW YORK

P. M. BRUNER GRANITOID CO.

ESTABLISHED 1878

Sidewalk Lights, Floor Lights, Skylights

425-426 Frisco Building
ST. LOUIS, MO.

Bruner Construction

Bruner sidewalk lights, floor lights and skylights conform to recommendations adopted by United States Department of Commerce, Division of Simplified Practice, as per bulletin No. 49.

Standard Sidewalk Light Construction

In this construction there can be no leakage and no breakage of glass from structural or expansion stresses. Glass broken from accident or abuse can easily be repaired without disfiguring the construction in any way.

Specifications—The sidewalk lights shown on plan shall be of two-way reinforced concrete rib construction as shown in P. M. Bruner Granitoid Co.'s Standard Sidewalk Light Bulletin, capable of carrying safe live load of 300 lb. per sq. ft. The glass to be 3½ in. square by ¾ in. thick at supporting edge, set in 4-in. square metal shields with elastic compound. The lenses shall be set 5 in. on center. The ribs shall be 2½ in. deep.

Bearing furnished for this construction should be 3 in. wide by 2¾ in. deep.

The entire construction to be guaranteed waterproof and free of defects for a period of one year. Replacement glass to be furnished free f.o.b. factory for 5 years.

Bruner Skylight Construction (Trade Name, "Transparent Roofing")

We recommend that concrete curbs be formed as part of the reinforced concrete roof. Bruner reinforced concrete skylights being laid over these curbs and projecting beyond with drip formed on under side (as shown), a permanently mechanical watertight job is assured.

Where required, however, this skylight construction can be made flush with roof by setting same in rabbet formed in reinforced concrete and calking with our special waterproof compound.

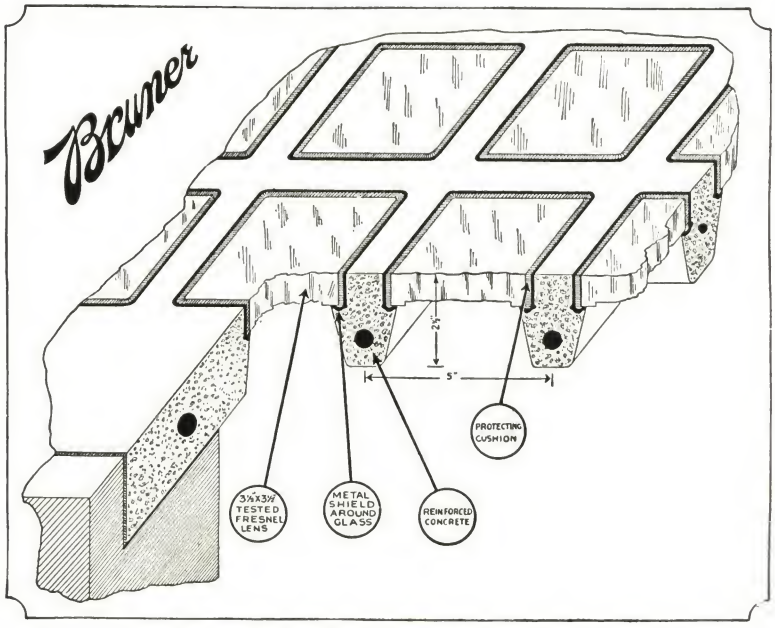
Specifications—The skylights shown on plan shall be of two-way reinforced concrete rib construction as shown in P. M. Bruner Granitoid Co.'s Skylight Bulletin. Glass to be ribbed wire 8¼ in. square, set in metal shields with elastic compound. Ribs shall be 3⅜ in. deep, set 9⅝ in. on centers both ways. The entire construction is to be guaranteed for one year, and replacement glass is to be furnished free of charge for a period of five years.

(Plans should show detail of bearing furnished.)

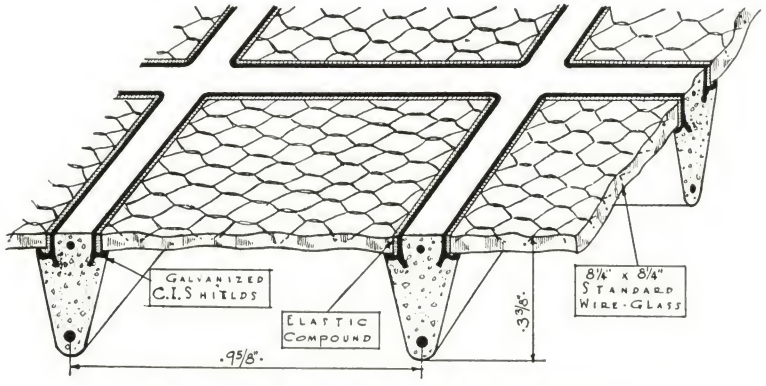
Broad Flexible Service

Bruner sidewalk lights, floor lights and skylights can be constructed in place, or made in panels at our factory and shipped anywhere.

We are at all times ready to give information, make details, or quote prices on our construction.

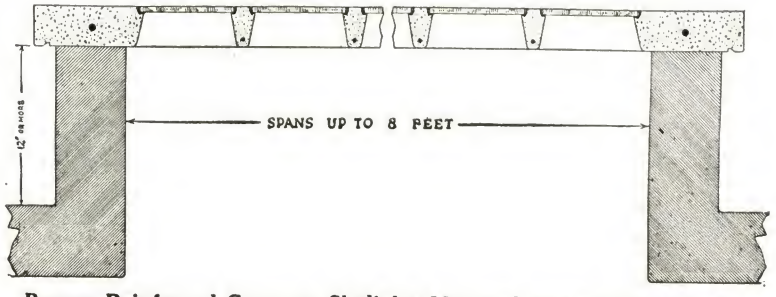


Standard Sidewalk Light Construction



Detail Bruner System Skylight Construction

Spans up to 8 ft. can be made without intermediate beams. Standard construction ribs are on 9⅝-in. centers. Standard wire glass is 8¼x8¼ in. The metal shield and protecting cushion construction is similar to that in the Bruner sidewalk lights



Bruner Reinforced Concrete Skylights Mounted on and Projecting Beyond Concrete Curbs

ESTABLISHED 1905

ALBERT GRAUER & COMPANY

Sidewalk Lights, Skylights, Floor Lights, Marquise Lights

1408 Seventeenth Street
DETROIT, MICH.

REPRESENTATIVES

ATLANTA GA., S. R. Hewitt, 320 Walton Building
BIRMINGHAM, ALA., John H. Wilkinson, 1735 Fifteenth Avenue, So.
BUFFALO, N. Y., Edwin G. Day & Co., Erie County Bank Building
CANTON, OHIO, O. J. Weigand, 1001 Clarendon Avenue, N. W.
CHARLESTON, W. VA., Fireproof Products Co., 216 Professional Building
CINCINNATI, OHIO, Al Levinson Company, 607 American Druggists Building
CLEVELAND, OHIO, John G. McRae, 2660 East Boulevard
COLUMBUS, OHIO, The B. M. Freeman Co., 42 E. Gay Street
DALLAS, TEX., Congleton Company, Inc., 502-3 Construction Building
DAYTON, OHIO, The John G. Pool Co., 494 Ludlow Arcade
DENVER, COLO., Building Products Corporation, 1435 Welton Street
FORT WAYNE, IND., Arc-Con Specialties Co., 1123 So. Clinton Street
GRAND RAPIDS, MICH., Charles Vandervelde, 757 Hawthorne Street, N.E.
GREEN BAY, WIS., Building Specialties Co. of Wisconsin, 1210 Bond Street
HUNTINGTON, W. VA., E. L. Warnick, P. O. Box 1581
HUNTSVILLE, ALA., Aiken & Kendall, Tennessee Valley Bank Building
KNOXVILLE, TENN., Chas. M. Allen Company, 712 So. Gay Street
LIMA, OHIO, Building Accessories Company, 311 W. High Street
LOUISVILLE, KY., Equipment & Supply Company, 420 Baxter Avenue
NASHVILLE, TENN., John Williams Company, 808 Independent Life Building
OMAHA, NEB., Kraus & Trustin, 636 Paxton Block
PHILADELPHIA, PA., R. C. Kratz, 311 Perry Building
PITTSBURGH, PA., Pittsburgh Building Specialties Co., 402 Jones Law Building
PORTSMOUTH, OHIO, Earl C. Hayes & Co., P. O. Box 908
RICHMOND, VA., Lee O. Miller & Co., 209 Builders Exchange
SAGINAW, MICH., Hugh Lee Iron Works, 312 No. Bond Street
ST. PETERSBURG, FLA., E. L. March, 303 Third Avenue, No.
SOUTH BEND, IND., South Bend Building Specialties Co., 232½ So. Michigan Street
TOLEDO, OHIO, Treuhaft Brothers, 1014 Sylvania Avenue
WASHINGTON, D. C., Lally Rohlader Company, Inc., 1756 M Street, N.W.
YORK, PA., C. H. Strayer, 50 W. Philadelphia Street

Products

GRAUER REINFORCED CONCRETE SIDEWALK LIGHTS, SKYLIGHTS, FLOOR LIGHTS, and MARQUISE LIGHTS; for all classes of buildings, tunnels, subways, train sheds, canopies, etc., installed in place or shipped in slabs ready to set.

Also manufacturers of Grauer Cement Floor Finish; Rubber, Linoleum and Cork Tile Floors, Composition Floors, Illuminating Sidewalk Doors, Coalhole Covers and Rings, Sidewalk Ventilators, Bullseye Glasses of every size for repairing sidewalk lights and skylights of any style or manufacture.

For Grauer-Watkins Red Asphalt Floor, Style-Tile Floors and Borders and Graustic Floor, see Manufacturers' Index.

Advanced Design

Grauer daylighting installations for all purposes are built on a scientifically correct design which makes them positively proof against any conditions of weather or use. Only accident or excessive abuse can break them.

New type Grauer Shield Protected Lights eliminate repairs. Plastic cushions (non-leakable) around the glasses protect them from shaling and breakage due to expansion of surrounding concrete.

Grauer SKYLIGHTS FLOOR LIGHTS SIDEWALK LIGHTS GRAUSTIC FLOORS RED ASPHALT FLOORS

With Grauer daylighting equipment buildings are given the great convenience and profitable investment of daylighting throughout, with assured permanent durability. When breakage does occur, due to accident, new glasses are easily installed by unskilled labor at a trifling cost and without showing the repair.

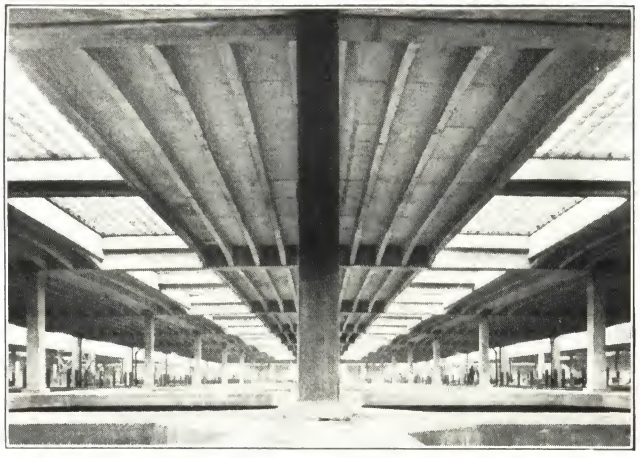
Fully Guaranteed

Grauer Shield Protected Sidewalk Lights are unconditionally guaranteed for one year, to be rustproof, leakproof, and free from defect. Replacement glasses will be supplied free f.o.b. factory for five years.

National Service

This organization is equipped to install Grauer Shield Protected Daylight constructions in any building anywhere. Skilled crews are placed in charge of each installation. Our experience of 25 years in the design and construction of daylighting equipment, assures scientifically correct installation and permanent satisfaction.

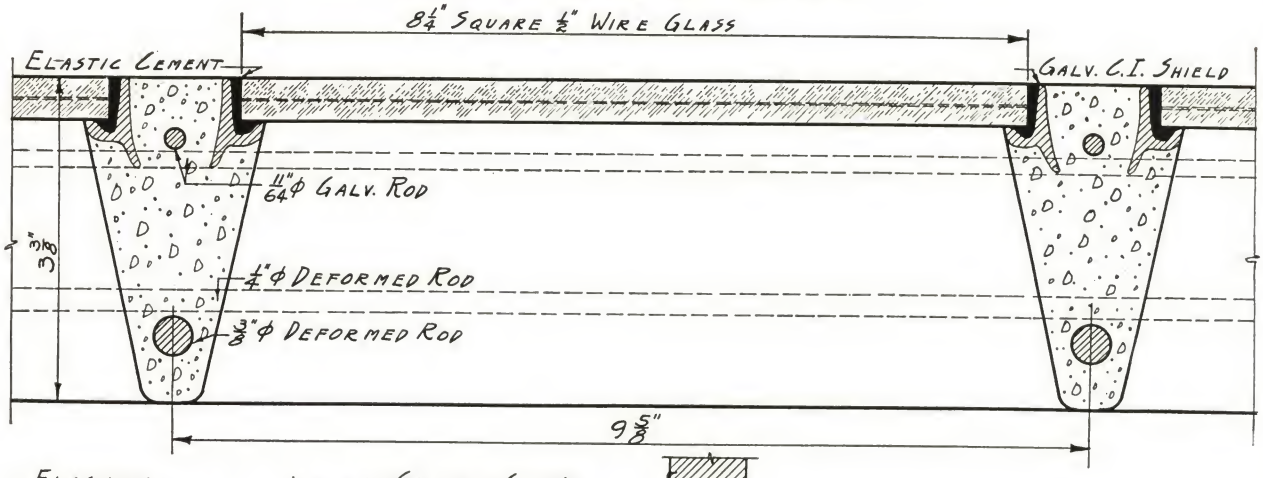
We shall be glad to offer suggestions and make sketches to solve unusual daylighting requirements promptly and cheerfully.

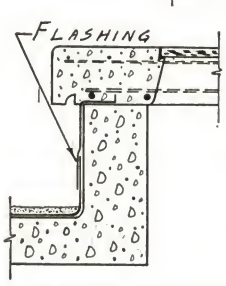


Skylights, Filter Building, Department of Water Supply, City of Detroit
JOHN CO. THORNTON, Architect
GEORGE H. FENKELL, Chief Engineer

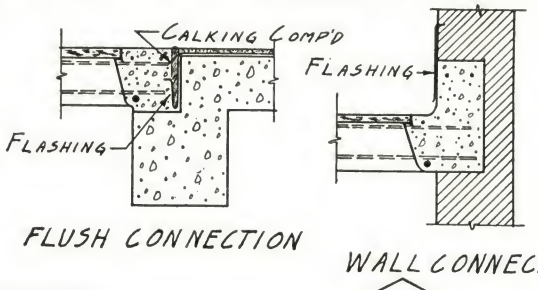
Basement Barber Shop, Pantlind Hotel, Grand Rapids, Mich. Daylighted by Grauer Sidewalk Lights

CONCRETE SKYLIGHT DETAILS



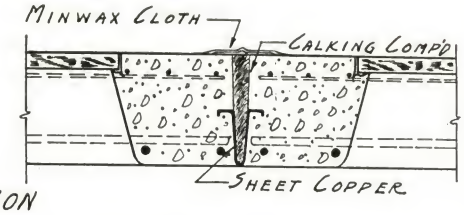


CURB CONNECTION

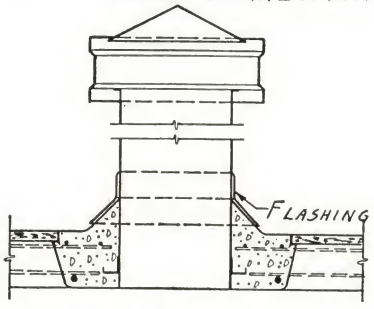


FLUSH CONNECTION

WALL CONNECTION



EXPANSION JOINT



VENTILATOR BASE

Structural Data

Maximum span 8 ft. between supports.

Live load 125 lbs. per sq. ft. over 8-ft. span.

Weight 25 lbs. per sq. ft.

Any type of ventilator installed.

Minimum pitch ⅜ to 12 ins.

Rabbets 3 ins. wide and 4 ins. deep.

Guarantee

This manufacturer shall furnish a written guarantee to maintain the construction against faulty materials and workmanship and any leakage caused by such for a period of one year and for four additional years shall furnish free of cost f.o.b. factory, replacement glass for any units broken by any cause outside of fire.

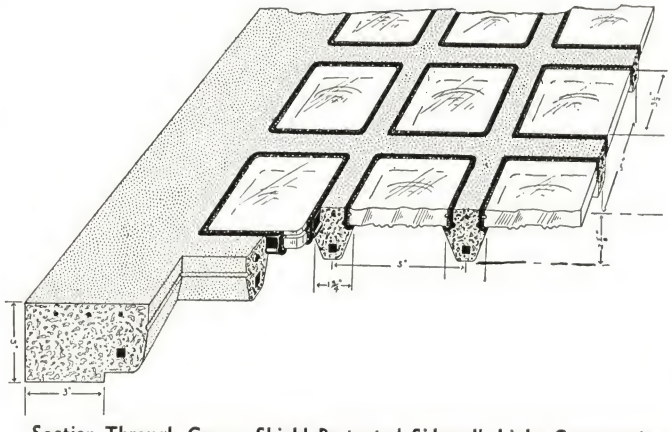
Specifications

Furnish and install where shown Transparent Roofing Skylights, consisting of standardized reinforced concrete and glass construction using 8¼ in. square, ½ in. thick wired glass set into hot dip galvanized cast iron shields with elastic material, and spaced 9⅝ ins. on centers. All in accordance with manufacturer's details and as approved through the services of the Simplified Practice Division of the Department of Commerce, Washington, D. C.

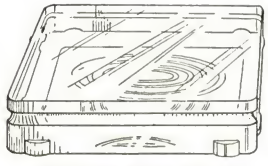
SIDEWALK LIGHT CONSTRUCTION

Specifications

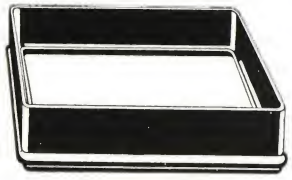
The sidewalk lights shown on plans shall be constructed with carrying members of reinforced concrete. The glass shall be Grauer No. 20, set in rustproofed metal shields with an elastic compound. The design to permit glass replacement with unskilled labor. All glass is to be polariscope tested and guaranteed free of internal strains. The construction shall be capable of carrying a uniformly distributed live load of 300 lbs. per sq. ft. without injury.



Section Through Grauer Shield Protected Sidewalk Light Construction



Diffusing Glass No. 20
3½x3½ ins.



Protecting Shield

Sidewalk Lights

The diagrams on preceding page illustrate the construction of Grauer Shield Protected Sidewalk Lights. This construction carries a load of 300 lbs. per sq. ft. and can be built to carry 1000 lbs.

Glass—The best quality of glass (Grauer No. 20) is used and guaranteed to be properly annealed, each glass having passed polariscope test.

Economy—The saving in electric current alone will pay for Grauer Shield Protected Sidewalk Lights in a short time, usually in one and a half years, the time depending on current rate. The added efficiency of employees or tenants using the basement, their health, comfort, and pleasant working conditions, pay manyfold for the daylight provided. Where basement spaces are daylighted, and used as salesrooms, the increased revenue frequently pays for the entire cost of construction in *less* than one year.

Ready-to-Set-Sidewalk Slabs—Completely built slabs can be supplied on order, to fit specified spaces, when for any reason it is not desired to have our own skilled workmen install daylighting construction.

Floor Lights

Floor lights permit the daylight to do double duty. Light thus admitted to a lower floor, even though diffused through one story, comes from above and is more efficient than light from side windows.

The construction is similar to that of Grauer Sidewalk Lights. The glass is, however, set directly in concrete as the extra expense of shields is unnecessary in interior installations.

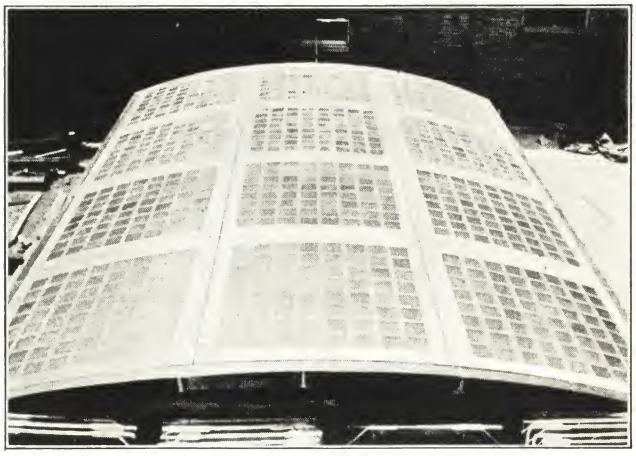
Grauer Floor Lights maintain more weight than an ordinary floor will hold. They are permanently watertight, proof against rust and fire.

The concrete carrying ribs are 3½ ins. in depth and on 6-in. centers both ways. The two styles of glasses are 4¾ ins. square by ¾ in. thick. No. 89 is plain flat; No. 88 is diffusing and ornamental.

Specifications—The floor lights shown on plans shall be constructed of reinforced concrete and glass according to the Grauer System; installed complete in place by the manufacturer's own workmen. The glass shall be diffusing glass No. 88 (plain glass No. 89) 4¾ ins. square, guaranteed free of strain by polariscope test. Spans up to 8 ft. are to be made without intermediate beams, with a guaranteed safe live load of 250 lbs. per sq. ft., with a factor of safety of 4.

The floor lights are not to be installed until after the surrounding floors have been laid complete. The floor light manufacturer is to provide an elastic waterproof expansion joint of approved materials on the four sides of each opening.

The construction and glass is to be guaranteed for a period of one year, and any defects appearing within this period are to be promptly corrected to the satisfaction of and without cost to the owner.



Colonel White School, Dayton, Ohio
BRUCE E. LLOYD, Architect

Marquise Lights

The Grauer skylight construction is admirably suited for use in marquises, and is now being generally utilized for this purpose. Architects, builders and building owners who have had trouble with the constant breaking of the ordinary ¼-in. wire glass formerly used in marquise work, have come to realize the economy and satisfaction of permanently meeting this problem in the first construction. The Grauer System is a most durable product adaptable to work of this character.

PARTIAL LIST GRAUER CONCRETE SKYLIGHT INSTALLATIONS

SQ. FT.	LOCATION	ARCHITECT
1246	Grosse Pointe High School, Grosse Pointe, Mich.	Geo. J. Haas, Detroit
1144	Detroit Edison Co., Detroit, Mich.	Company Engineers
531	Beggs Building, Columbus, Ohio	Miller & Reeves, Columbus
1795	Ohio Fuel Gas Co., Columbus, Ohio	Robt. S. Harsh, Columbus
214	Longfellow Junior High School, Flint, Mich.	Malcomson & Higginbotham, Detroit
140	David McKenzie High School, Detroit, Mich.	Smith, Hinchman & Grylls, Detroit
196	Administration Building, Michigan State College, Lansing, Mich.	Malcomson & Higginbotham, Detroit
377	Cooley High School, Detroit, Mich.	Donaldson & Meier, Detroit
125	Masonic Temple, Portsmouth, Ohio	Albert Pretzinger and Edwin P. Musselman, Dayton
373	Saginaw River Steam Plant, Zilwaukee, Mich.	Company Engineers
682	Colonel White School, Dayton, Ohio	Bruce E. Lloyd, Dayton
355	West High School, Columbus, Ohio	Howard Dwight Smith, Columbus
345	Nardin Park Church, Detroit, Mich.	Stahl & Morison, Detroit
944	Andrew Jackson School, Detroit, Mich.	B. C. Wetzel, Detroit
1226	Reynolds Building, Winston-Salem, N. C.	Shreve & Lamb, New York
140	Lockmoor School, Lockmoor, Mich.	Geo. J. Haas, Detroit
520	Feline House, Detroit Zoo	Donaldson & Meier, Detroit
5977	Detroit Edison Co. (Delray), Detroit, Mich.	Company Engineers
700	Allen Holding Co., Detroit, Mich.	I. M. Lewis, Detroit
384	Fire Department Headquarters, Detroit, Mich.	Hans Gehrke, Detroit
1660	Elizabeth Cleveland School, Detroit, Mich.	Donaldson & Meier, Detroit
1271	Washington Junior High School, Royal Oak, Mich.	Fred'k Madison, Royal Oak
469	Henry Tappan School, Detroit, Mich.	Louis Kamper, Detroit
2254	Southeastern High School, Detroit, Mich.	Malcomson & Higginbotham, Detroit
409	Detroit Edison Co. (Dequindre Coaling Station), Detroit, Mich.	Company Engineers
406	Butler County National Bank, Butler, Pa.	Uffinger, Foster & Bookwalter, Inc., New York
250	Zimmerman School, Flint, Mich.	Malcomson & Higginbotham, Detroit
675	Washington Junior High School, Pontiac, Mich.	Malcomson & Higginbotham, Detroit
308	Lowell Junior High School, Flint, Mich.	Malcomson & Higginbotham, Detroit
231	Edwin Denby School, Detroit, Mich.	Smith, Hinchman & Grylls, Detroit
312	Durfee School, Detroit, Mich.	Malcomson & Higginbotham, Detroit
231	John J. Pershing School, Detroit, Mich.	Smith, Hinchman & Grylls, Detroit
205	McKinley Monument, Canton, Ohio	H. Van Buren Magonigle, New York
3316	Old Merchants National Bank, Battle Creek, Mich.	Weary & Alford, Chicago
438	John J. Pershing School Addition, Detroit, Mich.	Smith, Hinchman & Grylls, Detroit
525	Christopher Columbus School, Detroit, Mich.	J. Ivan Dise, Detroit
349	L. M. Post School, Detroit, Mich.	McGrath & Dohmen, Detroit
943	Chas. E. Chadsey School, Detroit, Mich.	N. Chester Sorenson, Detroit
10407	Filter Plant, Detroit, Mich.	John C. Thornton, Detroit
286	Office and Laboratory Building, Detroit, Mich.	John C. Thornton, Detroit
417	Chemical Building, Detroit, Mich.	John C. Thornton, Detroit
1502	Power Structures, Detroit, Mich.	John C. Thornton, Detroit
4700	Detroit City Gas Co., Detroit, Mich.	Weston & Ellington, Detroit

J. MERRILL RICHARDS

"Unity" Transparent Roofing Skylights, Glass Roofs and Floors

Constructed According to U. S. Simplified Practice Recommendations

119-122 West First Street, BOSTON, MASS.

Products

RICHARDS "UNITY" SKYLIGHTS, GLASS ROOFS and FLOORS.

Also Standardized Sidewalk Lights.

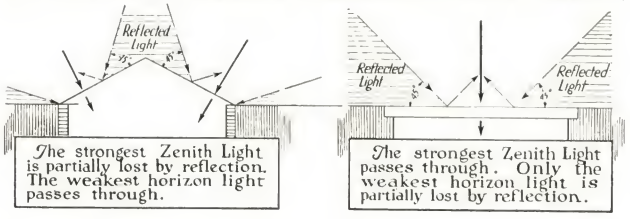
For Magnalite Obscuring-Diffusing Glass, see Glass (Obscuring and Diffusing) in Products Index.

For "B/G" Lead Coated Copper Sheets, see Lead Coating Division of Boston Galvanizing Works in Manufacturers' Index.

"Unity" Skylights

Standardized construction of 8-in. square commercial ½-in. thick wired glass, or Magnalite Diffusing Units, set into hot-dip galvanized cast iron shields with elastic material and supported by a fireproofed reinforced grid.

A Horizontal Skylight Transmits More Light



The strongest Zenith Light is partially lost by reflection. The weakest horizon light passes through.

The strongest Zenith Light passes through. Only the weakest horizon light is partially lost by reflection.

Advantages of "Unity" Skylights

A permanent construction with no structural members exposed. Strong, rigid and rustproof. Shields protect glass from all stresses so that, regardless of climate, glass will not break, except by accident. Can be installed on pitch or practically flat so as not to be visible on skyline. Watertight joints not dependent on calking alone.

Administration Building, Department of Agriculture, Washington, D. C.
RANKIN & KELLOGG, Architects
JAMES A. WETMORE, Supervising Architect

Special Feature

Magnalite Light Diffusing Glass Units furnished at slight additional cost. Ornamental and efficient for distributing light into corners. See Isolux Diagrams published under Magnalite Glass, for which refer to Magnalite Obscuring-Diffusing Glass, see Glass (Obscuring and Diffusing) in Products Index.

Specifications

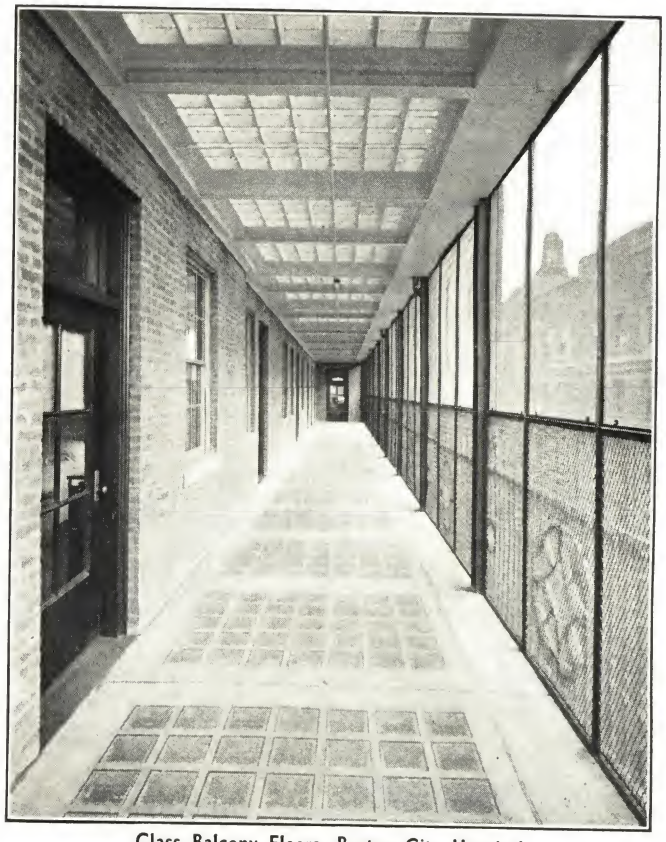
Richards' "Unity" Glass and Concrete Skylight using 8-in. square commercial ½-in. thick wire glass, (Magnalite Light Diffusing Units) set into hot-dip galvanized cast iron shields with elastic material. Built-in metallic waterproof expansion joints to be properly spaced and filled flush with Impervo elastic compound.

Guarantee

This contractor shall furnish a written *guarantee* to maintain the construction against faulty workmanship and defective materials and any leakage caused by such for a period of one year. Replacement glass shall be furnished owner, free of cost f.o.b. factory for four additional years, for units broken by any cause outside of fire.

Service

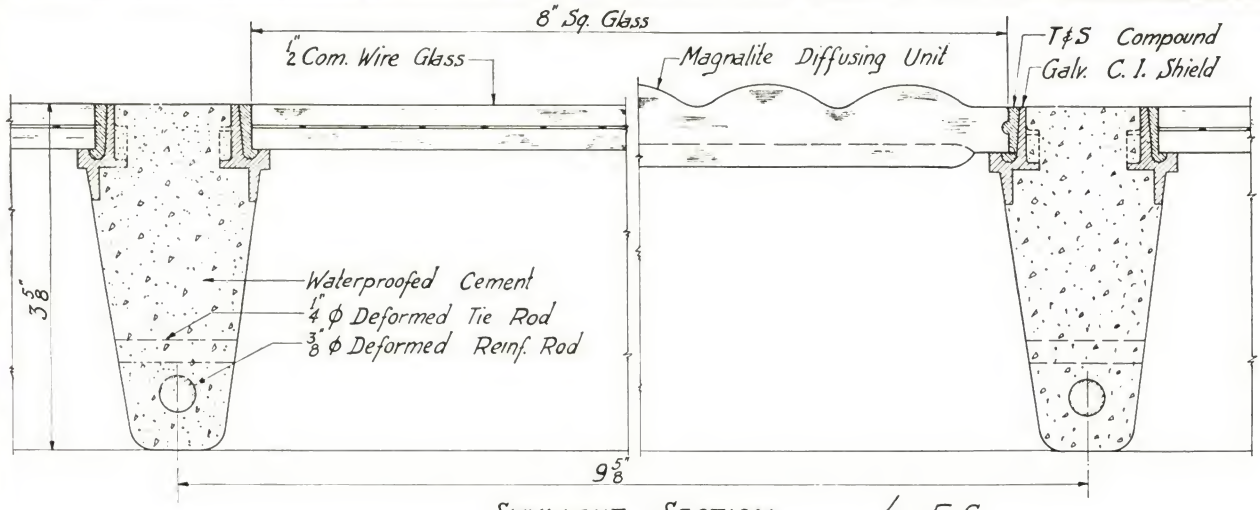
Skilled mechanics sent anywhere to install work.



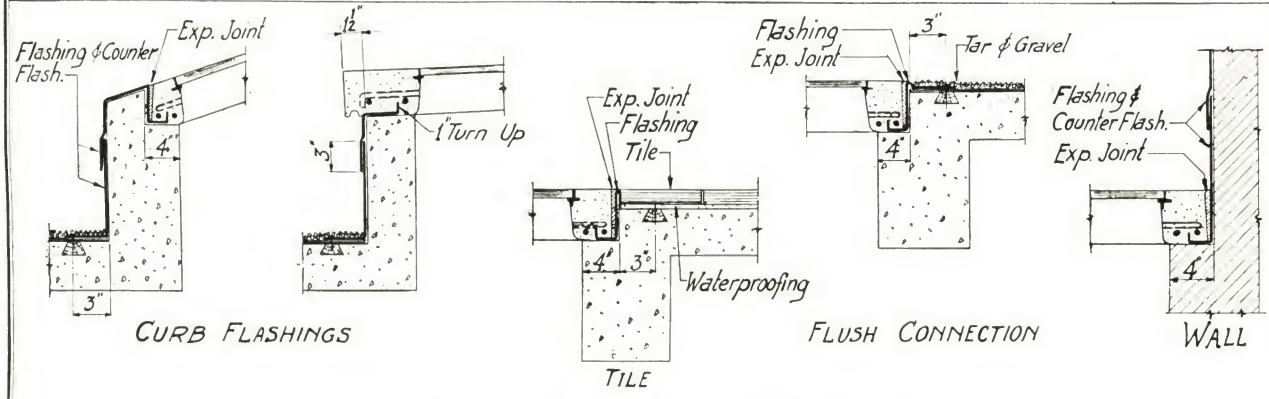
Glass Balcony Floors, Boston City Hospital
JAMES H. RITCHIE ASSOCIATES, Architects

List of Installations

Central Trust Co., Cambridge, Mass.
Faneuil Hall, Boston, Mass.
Harvard Indoor Athletic Building, Cambridge, Mass.
Monks & Johnson
Cram & Ferguson
Coolidge, Shepley, Bulfinch & Abbott
Provident Mutual Life Insurance Building, Philadelphia, Pa.
Union & New Haven Trust Co., New Haven, Conn.
Cram & Ferguson
Cross & Cross



SKYLIGHT SECTION 1/2 F.S.



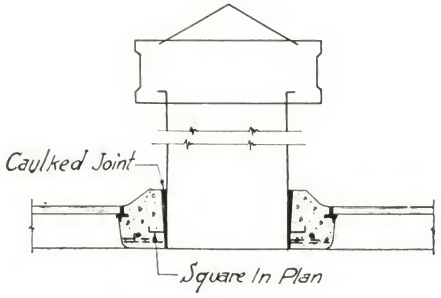
CURB FLASHINGS

TILE

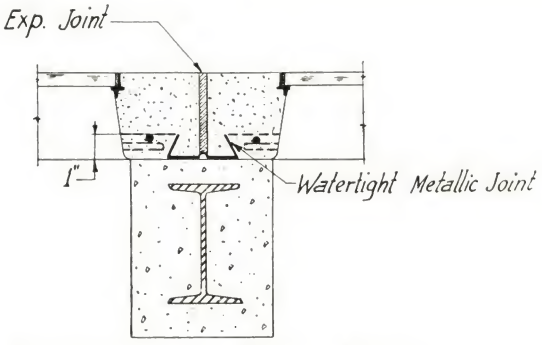
FLUSH CONNECTION

WALL

WATER TIGHT ROOF CONNECTIONS



VENTILATOR BASE



INTERMEDIATE EXP. JOINT

STRUCTURAL DATA

Max. span 8'-6" between supports.
Live load 125 lbs per sq. ft. over 8'-6" span.
Weight 25 lbs per sq. ft.
Any type of ventilator installed.
Minimum pitch 3/8" to 12".
Rabbels 4" wide and 4" deep.

SPECIFICATIONS

Richards' "Unitr" glass and concrete Skylight using 8" square (commercial 1/2" thick wired glass or Magnalite Light Diffusing Units) set into hot dip galvanized Cast Iron Shields with elastic material. Built-in metallic waterproof expansion joints to be properly spaced and filled flush with Impervo elastic compound.

STANDARDIZED CONSTRUCTION	"UNITY" SKYLIGHT DETAILS BY J. MERRILL RICHARDS 119-122 WEST FIRST ST. BOSTON, MASSACHUSETTS	DATE: MAY 1931 REVISED	DRWG. 1

STRUCTURAL GLASS CORPORATION

101 Park Avenue
NEW YORK, N. Y.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

"Structural" Glass Masonry for Walls, Partitions, Windows, Sidewalks, Floors, Ceilings, and Roofs.

"Structural" Vacuum Glass for Insulation.

BUILD WITH DAYLIGHT

Service

Full construction data for standard "Structural" installations supplied on request.

Our Engineers will assist in developing new uses for "Structural" Glass Masonry.

Glass Masonry

Description—Unlike any other type of masonry used in building construction, "Structural" glass masonry does not obstruct light.

Being built of glass, developed in durable structural forms, it offers a direct and straightforward solution for many architectural problems.

For horizontal work, such as sidewalks, floors, ceilings, roofs, etc., "Structural" glass masonry is built with flush type prisms of a special character set in reinforced concrete.

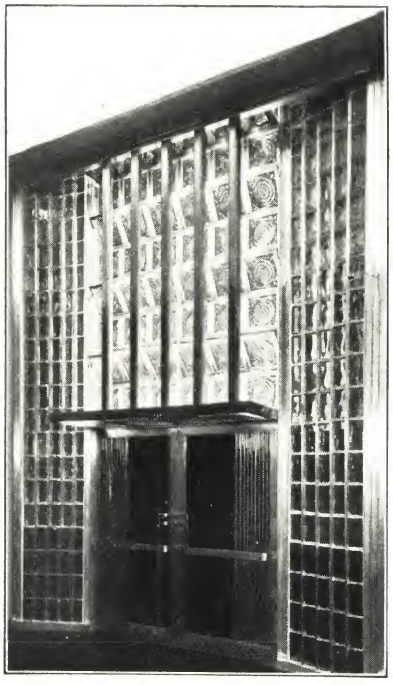
Walls, partitions and windows and similar vertical work are constructed with either prisms, tile, hollow block, vacuum block or solid brick. These are laid up with portland cement in masonry coursing by our skilled union mechanics.

Advantages—"Structural" glass masonry combines lighting with other special advantages.

Properly employed, glass is interesting and expressive.

It is entirely impervious and consequently sanitary. It displays and reveals. In vacuum block form it has high value as insulation against sound, heat or cold.

And, because glass masonry is a complete construction in itself, needing no maintenance, its cost is moderate.



Awarded Gold Medal Architectural & Allied Arts Exposition, New York, 1931

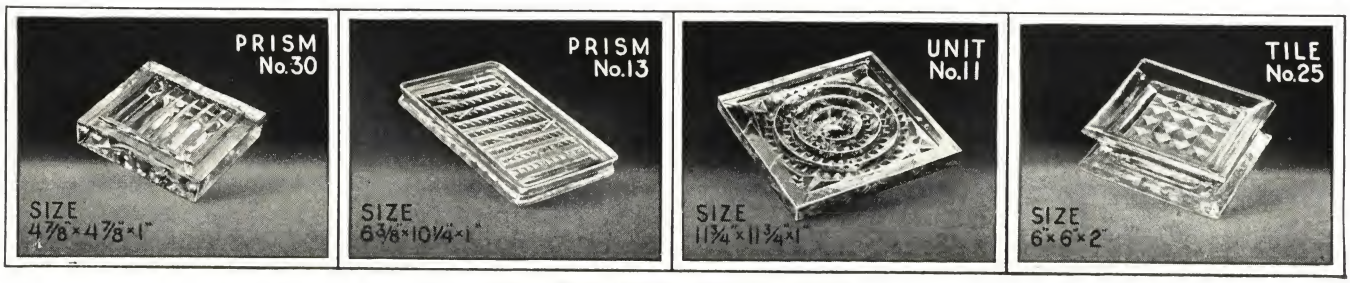
Uses—Wherever lighting is a planning requirement, "Structural" glass masonry merits consideration. It has been successfully used in nearly every type of public or private building, including railroad stations, museums, hospitals, banks, hotels, natatoriums, stores, etc. For the exacting requirements of Industrial work, "Structural" glass masonry is used both for lighting and as insulation of the most sanitary and efficient type. Hangers, storage plants, bakeries, creameries, abbatoirs, etc., are built with walls or partitions of "Structural" glass masonry.

Walls and Partitions

Besides admitting light, a "Structural" glass masonry wall or partition answers other important requirements. These determine whether prism, tile, hollow block, vacuum block or solid brick is best employed.

For lighting chiefly, use prism or tile. Where visibility is a requirement, use hollow block or solid brick. As special protection against fire or breakage, use wire prism or wire hollow block. To insulate against sound, heat or cold, use vacuum block. For interest or display, each "Structural" unit has its own value.

All units are laid up in portland cement and are built solidly against the uprights of door or window openings to provide a rigid and substantial construction.



Some Typical "Structural" Glass Units

Windows

"STRUCTURAL" windows are of the stationary type, with ventilator sections where required. They are built of glass masonry with either prism, tile, hollow block, vacuum block or solid brick.

Since "STRUCTURAL" windows are built into a raglet provided in the masonry opening, they are completely weathertight and are as permanent and durable as the walls themselves. When constructed of wire prism or wire hollow block they are used as fire windows.

Heat losses are negligible and large glazed areas become soundproof when vacuum block with its 90% vacuum is employed.

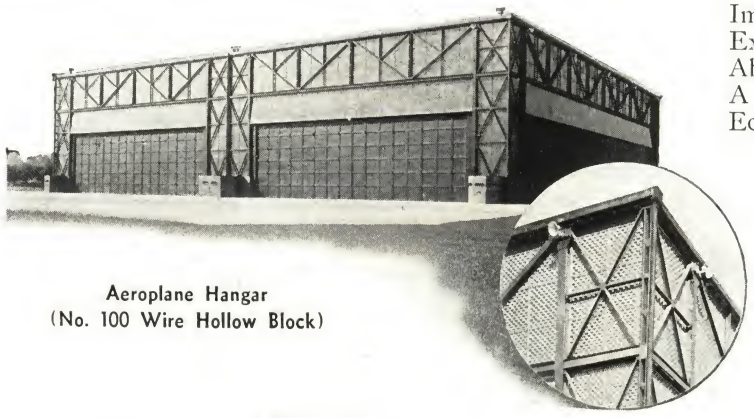
Floors, Ceilings and Roofs

The most direct means of securing daylight through floors, ceilings or roofs is to construct them of glass masonry. "STRUCTURAL" installations have high lighting value (without glare) and are distinctive in appearance because their clear white glass is of heavy (flush type) prism design.

For floors, prism No. 14, size 6⅜x6⅜ in. is used, in a construction similar to that of "STRUCTURAL" sidewalks, except that metal shields are omitted.

For ceilings and roofs, in addition to prism No. 14, prism No. 13, size 6⅜x10¼x1 in., and prism No. 24, size 8¼x8¼ in., are used. Prism No. 13 is also furnished in wire prism.

The roofs of setbacks present valuable lighting opportunities when constructed of "STRUCTURAL" glass masonry, which is guaranteed watertight.



Aeroplane Hangar
(No. 100 Wire Hollow Block)

Sidewalks

Nearly 80% of a "STRUCTURAL" glass masonry sidewalk is glass. This extreme daylight area is gained with prism No. 30, which measures 47⅞x47⅞ in. and is of highest quality white hard pressed glass, a full inch in thickness.

All prisms are set in rustproof metal shields with elastic compound in an approved reinforced concrete construction. "STRUCTURAL" sidewalks are economical in cost and are fully guaranteed.

Ceiling of Laboratory, New School of Social Research, New York, N. Y.
(Prism No. 13)

Vacuum Glass Insulation

By laboratory test, "STRUCTURAL" Vacuum Block is found to reach a 90% vacuum. As insulation it has a value comparable to the familiar vacuum bottle.

"STRUCTURAL" Vacuum Glass Insulation for building construction has the important advantage of being both *glass insulation* and *insulated glass.* It is an achievement which insures:

No condensation problems
Negligible heat loss
Improved temperature control
Exclusion of sound or heat
Absence of dark areas
A fully sanitary surface
Economy in cost

The opportunities it offers in industrial work are unlimited.

Condensed Specification

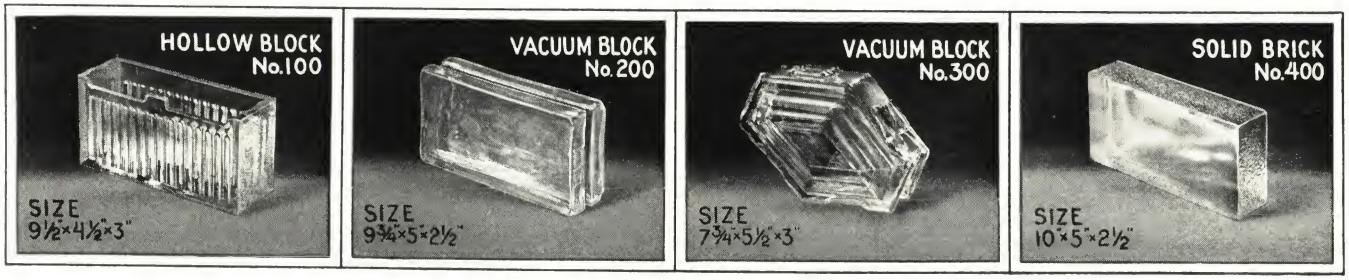
Where indicated on Architect's drawings the [Walls] [Partitions] [Windows] [Sidewalks] [Floors] [Ceilings] [Roofs] shall be constructed of "STRUCTURAL" Glass Masonry which shall be furnished and installed by the STRUCTURAL GLASS CORPORATION, New York, N. Y.

"STRUCTURAL"—(specify type and number of unit) shall be used for—(specify use).

All work shall be fully guaranteed free from all defects for a period of one year after acceptance by the architect.

Further Information

We furnish shop details and complete specifications for all "STRUCTURAL" installations. Inquiries regarding our products, requests for quotations, estimates, special designs, etc., receive prompt attention.



Some Typical "Structural" Glass Units

RICHARDS & KELLY MANUFACTURING CO.

Manufacturers of Prismatic Lights

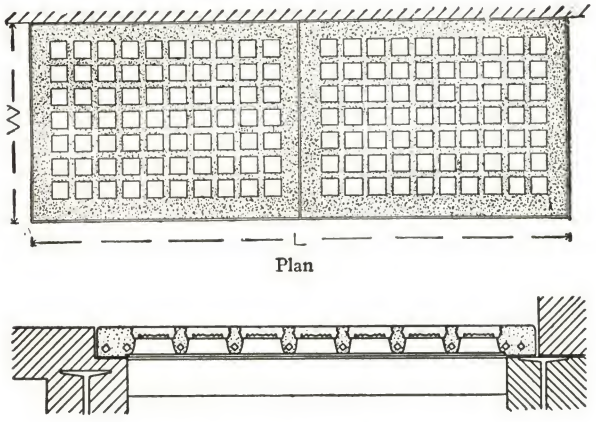
309-311 West Twenty-third Street, CHICAGO, ILL.

Products

REINFORCED CONCRETE SIDEWALK LIGHTS.
REINFORCED CONCRETE FLOOR LIGHTS.
REINFORCED CONCRETE ROOF LIGHTS.
CAST IRON SIDEWALK LIGHT REPAIRS and REPLACEMENTS.
SIDEWALK DOORS.
COALHOLE COVERS.

Reinforced Concrete Sidewalk, Floor and Roof Lights

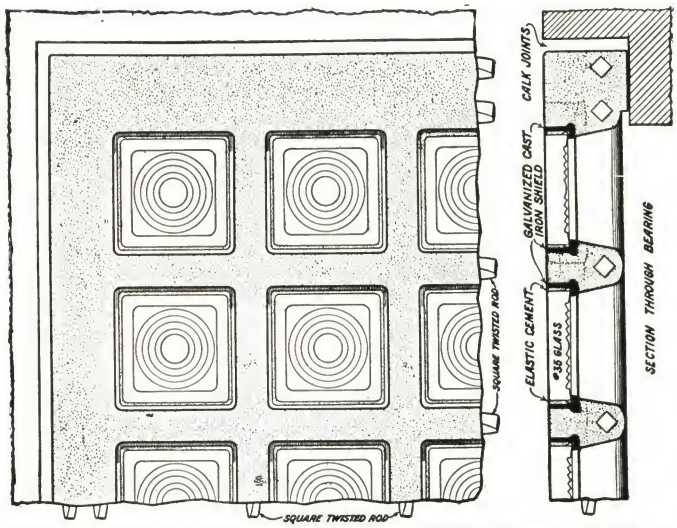
Manufactured in accordance with simplified practice recommendations adopted at Washington, D. C., November 18, 1925, by Sidewalk, Floor and Roof Light manufacturers, distributers and users, acting in conjunction with the Division of Simplified Practice.



Plan

Cross Section

Details Construction of Reinforced Concrete Sidewalk Lights



Detail Showing Galvanized Cast Iron Shield Protected Glass

Glass

For Sidewalk Lights—3½x3½ in. in *galvanized cast iron shields;* 3-in. diameter in *galvanized cast iron shields.*

For Floor Lights—3½x3½ in. in *galvanized cast iron shields;* 4x4 in. and 6⅛x6⅛ in. without shields.

For Roof Lights—8¼x8¼ in. wire glass set in *galvanized cast iron shields.*

Guarantee—We will furnish free of charge f.o.b. our factory any glass broken in our *galvanized cast iron shield* types of construction for a period of five years from date of installation, unless breakage is caused by fire or misuse.

Cast Iron Sidewalk Lights

We have discontinued furnishing cast iron sidewalk lights for new installations, but have patterns and glass for repairs and replacements.

Glass—For concrete setting 2½ and 3 in. in diameters, 3 in. square, 2½x3½ in.

For sulphur setting 1⅝ in. in diameter.

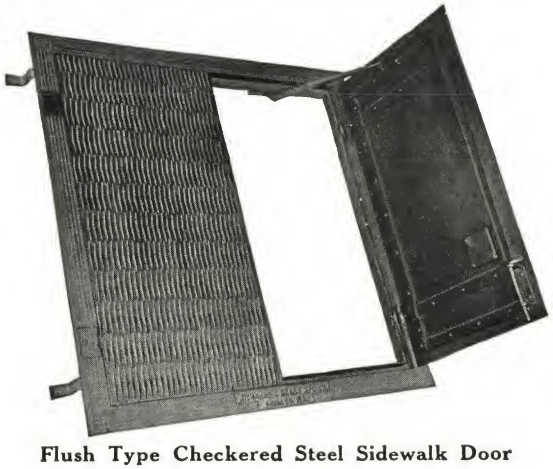
Sidewalk Doors

Manufactured in flush or raised types with checkered steel plate door leaves.

Illuminating doors made in either flush or raised type with 3 in. square glass set in checkered steel plate door leaves.

All doors are fitted with brass hinges, device to hold doors while open, slide bolt to lock from below and anchors to build into concrete. Door leaves can be fitted with striker plates if doors are operated with arch on car platform.

Flush type door frames made either of one piece iron castings or welded steel channel frames with gutter tapped for ¾ in. pipe to carry off water which seeps through joints between doors and frames.



Flush Type Checkered Steel Sidewalk Door

Coalhole Covers and Frames

Sidewalk Type Stock Sizes—16, 18, 20, 24 and 30 in., with or without glass. Special sizes 26, 28 and 36 in.

Driveway Type Stock Sizes—20, 24 and 30-in. diameter; 20x20, 24x24 and 30x30 in.

Quotations and Details

Furnished promptly upon request, prices on sidewalk, floor or roof lights, given either f.o.b. cars or installed at building.

THE G. DROUVÉ COMPANY

Manufacturers of Puttyless Skylights and Sash Operators

TELEPHONE
Bridgeport 5-3161
CABLE
Western Union Code

(Post Office Address)
BRIDGEPORT, CONN.

FACTORY
FAIRFIELD

REPRESENTATIVES
PITTSBURGH, PA., E. K. Geyser, 921 Fulton Building
PHILADELPHIA, PA., G. Drouvé Company, 112 So. 16th Street
GREENVILLE, S. C., J. A. Mac. Rabb
ATLANTA, GA., Applewhite & Lawler Co.

Products

"Anti-Pluvius" Puttyless Skylight, trade-marked and patented.

"Anti-Pluvius" (Non-corrosive) Puttyless Skylight, patented.

"Drou-Ve-Lite" Glass Structure, trade-marked and patented.

"Drou-Ve-Lite" (Non-corrosive) Glass Structure, patented.

Drouvé Continuous Ridge Ventilator, patents pending.

Drouvé Ventilating Turret Sash Construction, patents pending.

Worm and Gear Sash Operator, Torsion Type.

Also manufacturers of "Drou-Ve-Lite" Sawtooth Continuous Ventilating Skylight and the "Drouvé" Double Gutter Ventilators.

A MODERN SKYLIGHT SERVICE FOR EVERY NEED

Manufacturing and Shipping Facilities—Our plant is a modern one-story factory building containing 40,000 sq. ft. of floor space completely equipped with the most modern sheet metal working machinery known to the trade.

This entire plant, one of the largest of its kind in the country, is devoted exclusively to the manufacture of "Anti-Pluvius" Puttyless Skylights, Drou-Ve-Lite Glass Structures, Drou-Ve-Lite Sawtooth Continuous Ventilating Skylights and various types of sash operating devices.

With a siding of the New York, New Haven and Hartford Railroad at our plant we are enabled to make prompt shipments to any part of the country.

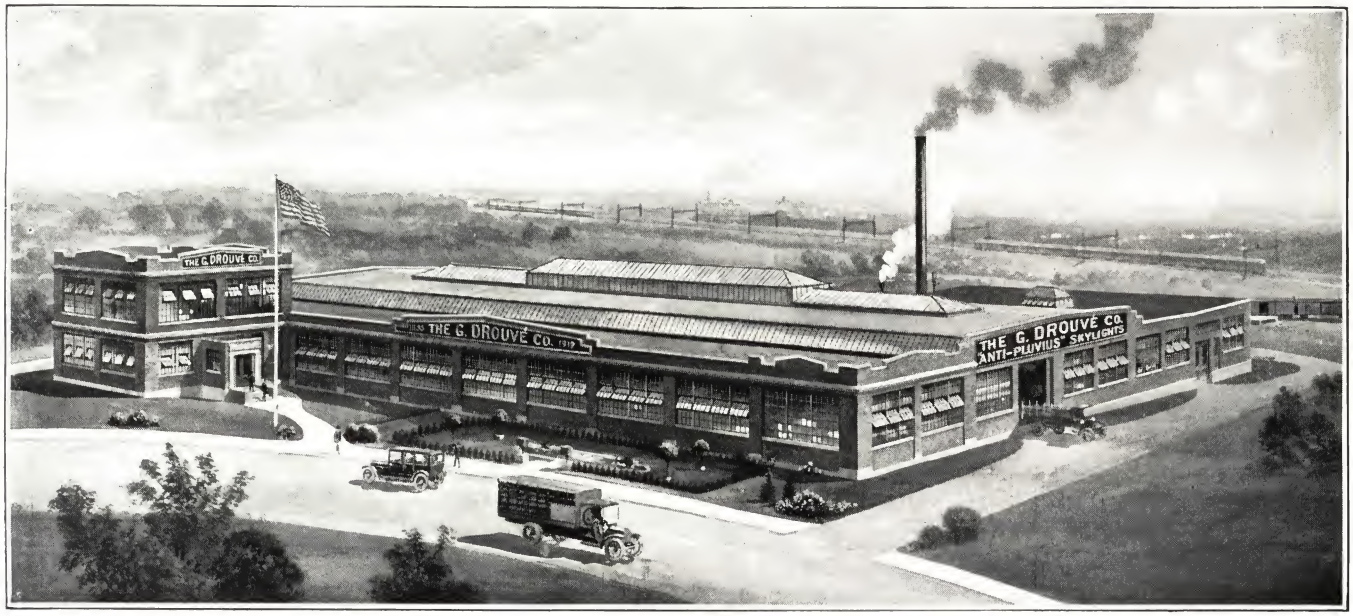
Planning and Consulting Service—An experience of over 40 years in solving skylight problems enables us to offer you practical solutions for your most intricate problems of skylight construction. Our engineering staff is ready to co-operate with you by means of a personal call or by preparing suggestions for use with the architectural drawings, without obligation to you.

Early consultation on skylights often saves on the cost of the building. Frequently it is possible to save considerably by the omission of part of the steel framing of a roof with the use of the "Drou-Ve-Lite" structural type of skylight which is designed especially for long spans and does not require structural reinforcing. At other times, for ordinary conditions, the "Anti-Pluvius" offers a better solution. Sometimes both are used on the same job depending on conditions. For these reasons we are always glad to go over the work under consideration and offer advice as to the type best suited to the work, without charge or obligation on the part of the architect.

Erecting Service—No matter how good a skylight is, if it is not carefully and properly put together there is always the chance that it will leak. This makes the owner dissatisfied with the work of the architect, the builder and the skylight manufacturer.

In order to insure proper and careful erection we maintain a force thoroughly skilled in erecting our skylights. They can be sent to any part of the country as required from our main office or nearest representative.

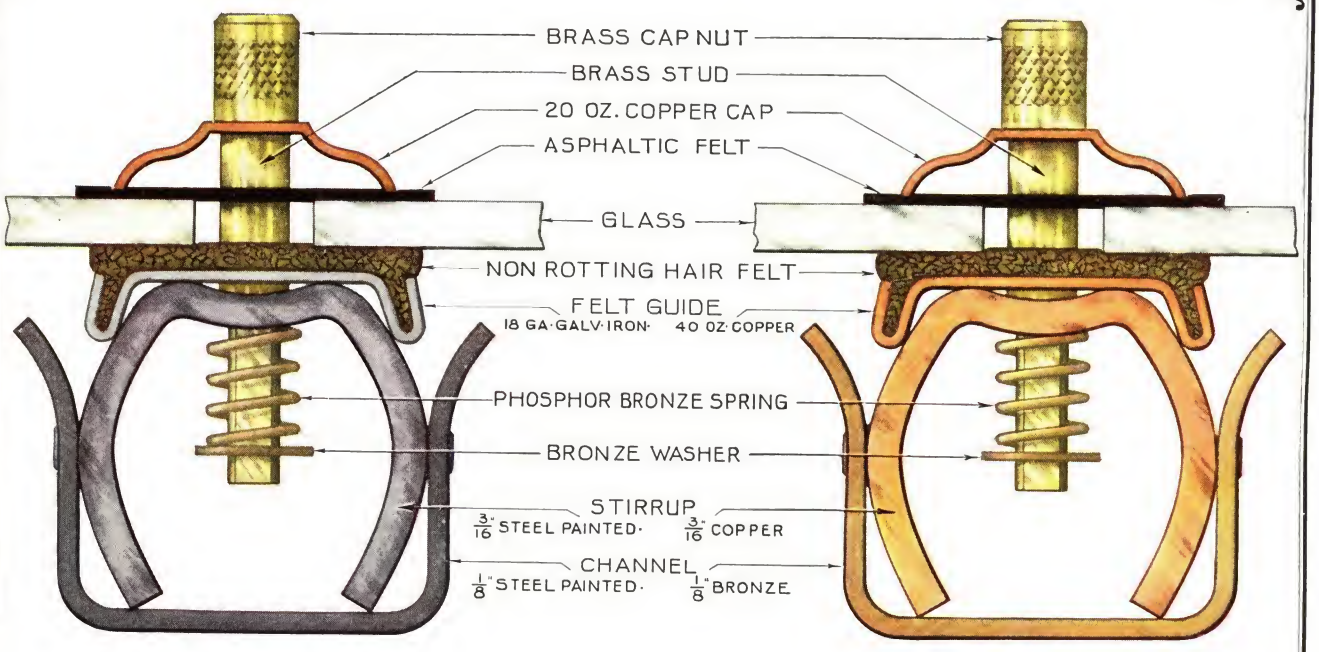
If required we will ship skylights for erection by the local sheet metal contractor.



Forty Thousand Square Feet of Floor Space Devoted Exclusively to the Manufacture of All Products Listed Above

ANTI-PLUVIUS

PUTTYLESS SKYLIGHT



Type A

The above full size illustration shows our regular "Anti-Pluvius" puttyless skylight, Type A construction which was originally placed on the market by us some 40 years ago. Only minor changes, as the result of experience, have been made in this skylight since its original inception. Years of practical experience with this type of puttyless skylight construction under all kinds of ordinary atmospheric conditions has proved that they will give satisfactory service.

The basic principle in this construction is the elimination of condensation forming on the underside of its main supporting bars (channels) so prevalent in a wrongly constructed skylight. This is accomplished by our patented method of isolating the glass and the glass rest from the main supporting bars, permitting of a free circulation of air between the main supporting bars and the glass.

In this construction, it is to be noted that we utilize the main supporting bars as condensation gutters as well as to give ample support for the skylight structure. This gives an exceptionally large condensation gutter due to the depth of the channels without cutting down excessively on the glass area which, in skylights, is always desired in the maximum, the over-all width of the channels at their widest point being only 2½ in.

This skylight, Type A construction, is furnished, so far as materials are concerned, exactly as illustrated above.

More detailed information and specifications for this skylight can be found on pages 3 and 4 following.

Type B

The full size illustration shows our "Anti-Pluvius" *non-corrosive* puttyless skylight, Type B construction. This skylight in design and construction is identical with Type A, the difference being only in the materials used. These are of non-corrosive materials throughout (not a protective process).

This construction is guaranteed absolutely against any form of deterioration for an indefinite length of time. The cost of this construction is surprisingly low considering the fact that it gives a skylight entirely free from any maintenance expense.

This skylight is ideal for use on powerhouses, chemical plants, railroad shops, foundries and buildings near salt water, as it will stand up under the atmospheric conditions existing in such buildings.

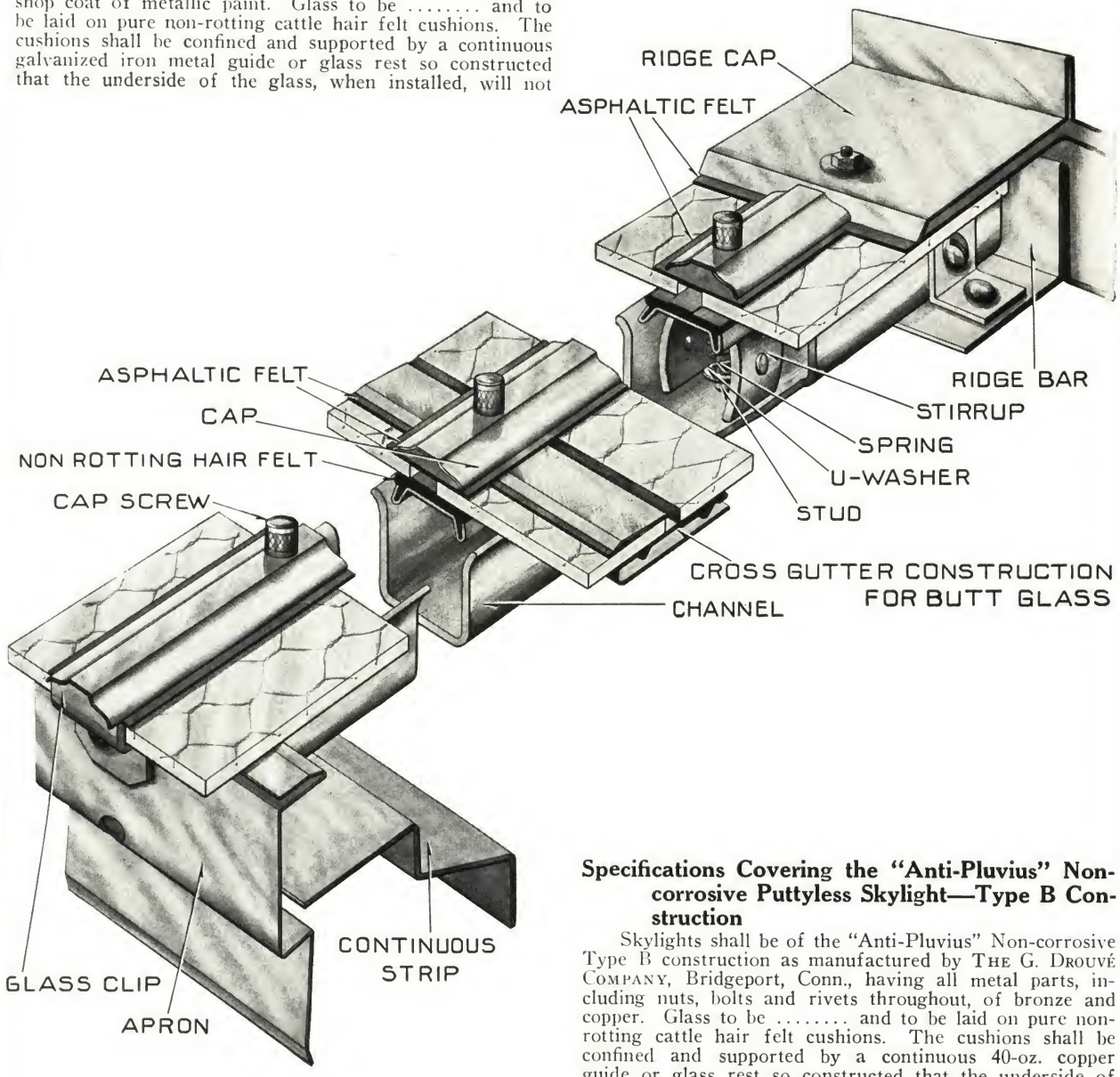
This skylight was originally placed on the market by us for use particularly under unusual atmospheric conditions, such as will be found in the types of buildings named above where they have various atmospheric conditions disastrous to steel. However, it has been a surprise, even to ourselves, the large number of specifications calling for this *non-corrosive* construction for use in libraries, bank buildings, museums, etc., for the reason that this construction is decidedly in keeping with the high grade materials usually incorporated in these types of buildings.

This skylight, Type B construction, is furnished, so far as materials are concerned, exactly as illustrated above. More detailed information and specifications for this skylight can be found on pages 3 and 4 following.

ANTI-PLUVIUS
PUTTYLESS SKYLIGHT

Specifications Covering the Regular "Anti-Pluvius" Puttyless Skylight—Type A Construction

Skylights shall be of the "Anti-Pluvius" Type A construction as manufactured by THE G. DROUVÉ COMPANY, Bridgeport, Conn., having all metal parts which are exposed to the weather of copper. Skylight ribs or main supporting channels to be U-shaped of carbon steel, painted one good shop coat of metallic paint. Glass to be ..... and to be laid on pure non-rotting cattle hair felt cushions. The cushions shall be confined and supported by a continuous galvanized iron metal guide or glass rest so constructed that the underside of the glass, when installed, will not come in contact with any material other than the felt. The glass rest shall be raised above the channels a sufficient distance so that there will be a free circulation of air between the glass and the channels. Skylight studs and caps to be so constructed as to allow for expansion, contraction and vibration by the use of phosphor bronze springs.

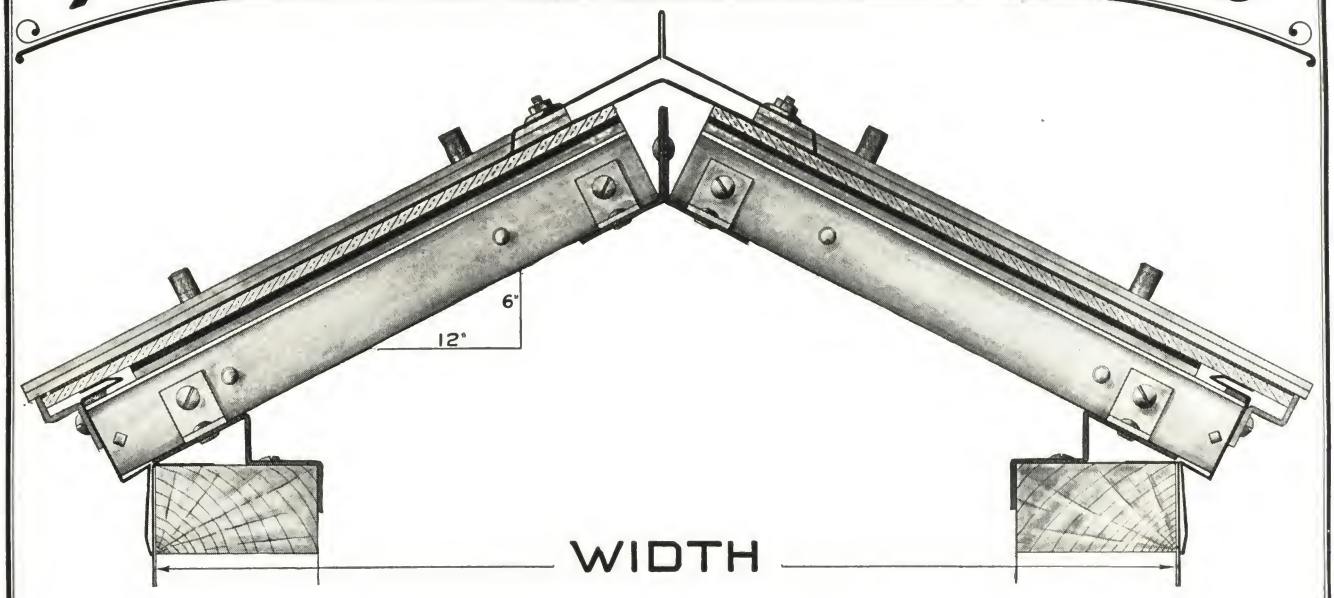


Specifications Covering the "Anti-Pluvius" Non-corrosive Puttyless Skylight—Type B Construction

Skylights shall be of the "Anti-Pluvius" Non-corrosive Type B construction as manufactured by THE G. DROUVÉ COMPANY, Bridgeport, Conn., having all metal parts, including nuts, bolts and rivets throughout, of bronze and copper. Glass to be ..... and to be laid on pure non-rotting cattle hair felt cushions. The cushions shall be confined and supported by a continuous 40-oz. copper guide or glass rest so constructed that the underside of the glass, when installed, will not come in contact with any materials other than the felt. The glass rest shall be raised above the channels a sufficient distance so that there will be a free circulation of air between the glass and the channels. Skylight studs and caps to be so constructed as to allow for expansion, contraction and vibration by the use of phosphor bronze springs.

ANTI-PLUVIUS

PUTTYLESS SKYLIGHT



The above illustration shows a section through our "Anti-Pluvius" puttyless skylight, either Type A or Type B construction. This particular illustration shows the skylight self-supporting; that is, without any structural steel trusses and purlins.

When using our Type A construction, which has steel channels, the width dimension for self-supporting type must not exceed 15 ft. which will give a span or channel length from ridge to eave of approximately 8 ft. 6 in.—the maximum this channel will carry without deflection.

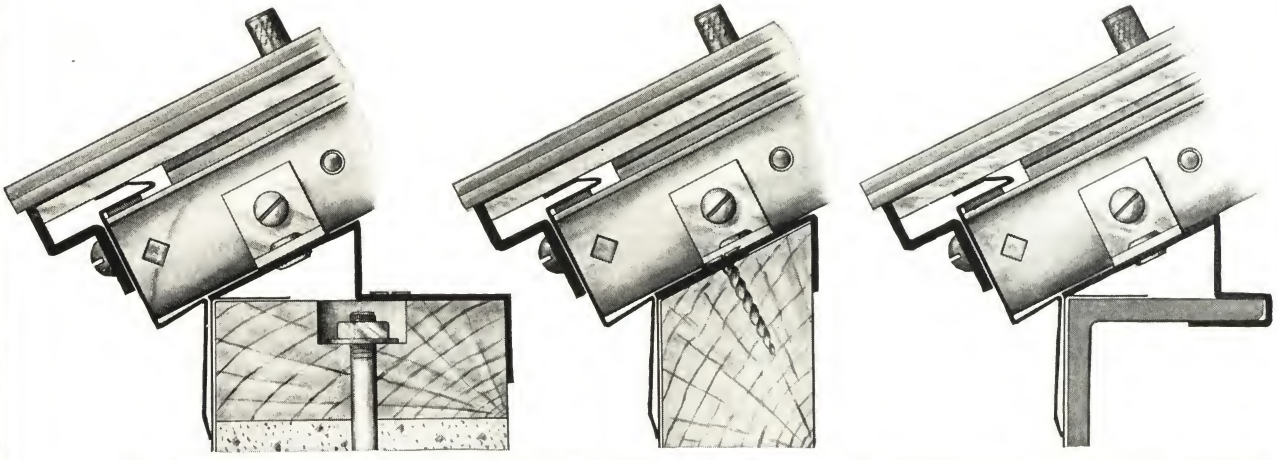
When using our Type B construction, which has bronze channels, the width dimension for self-supporting type must not exceed 13 ft., which will give a span or channel length from ridge to eave of approximately 7 ft. 6 in.—the maximum this channel will carry without deflection.

For widths greater than those mentioned above, structural steel supporting frames furnished by others are necessary.

Regarding the length of skylights, they can be of any length you may desire as our construction is not in any way affected by this.

Our "Anti-Pluvius" puttyless skylight possesses many advantages:

(1) Strength to suit the most exacting requirements.
(2) Positive watertightness.
(3) No sweating of main supporting bars (channels).
(4) Easily adaptable to all types of roof construction.
(5) Admits maximum daylight and casts minimum shadows.
(6) Frames are flexible, and ample allowances are made for expansion and contraction, vibration and wind pressures.



FLAT TOP CURB **BEVEL TOP CURB** **STRUCTURAL STEEL CURB**

The illustrations above show three different types of most generally used skylight curbs.

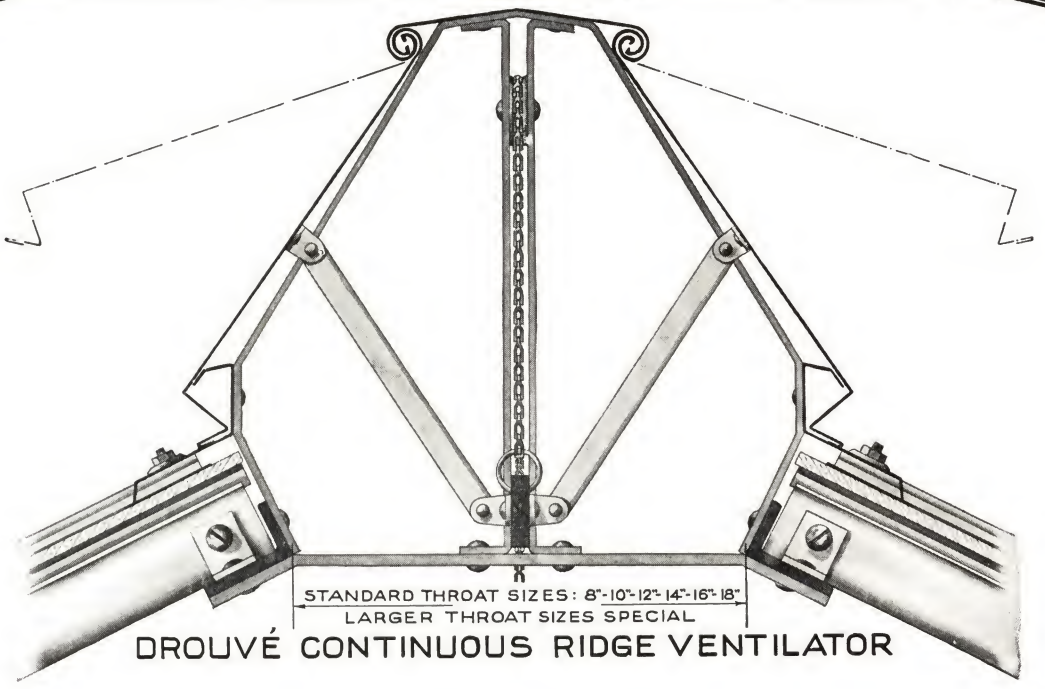
Concrete curbs should have wood plate on top, anchored to the curb as shown. Concrete curbs should not be less than 6 in. in thickness.

Wood curbs can be furnished either with bevel top as shown or flat top and should not be less than 4 in. in thickness.

Structural steel curbs, made either from angles as shown or channels, should have a top leg or flange of not less than 3 in.

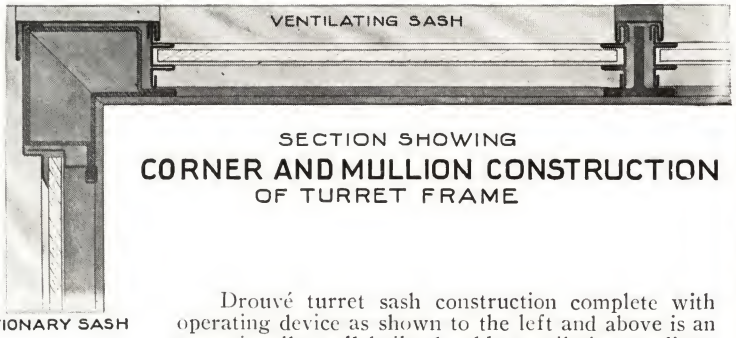
It is understood that the curbs are not a part of the skylight manufacturer's contract. These are always furnished by others. Also, the flashing of these curbs is not a part of the skylight contract but should be done by the roofing or sheet metal contractor.

RIDGE VENTILATOR AND TURRET CONSTRUCTION

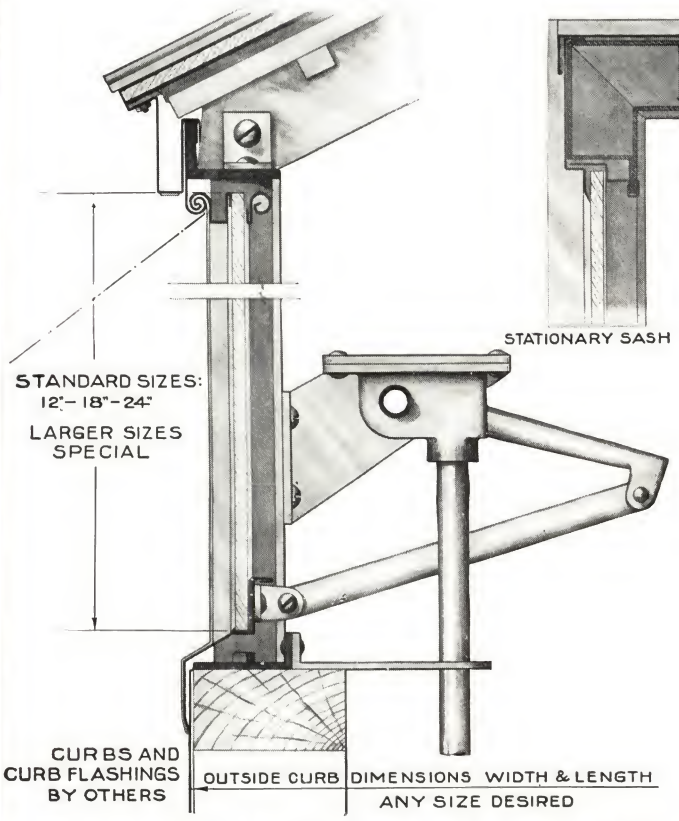


DROUVÉ CONTINUOUS RIDGE VENTILATOR

The above illustration shows a type of ridge ventilator construction that positively will not leak. This particular type can be opened and closed as desired. Operating mechanism for opening and closing is an exceptionally simple device that will work satisfactorily without trouble at all times. Rolled edges of the roof section and opening section interlocking in each other give a continuous hinge and prevent any leakage whatever at this point.



SECTION SHOWING
CORNER AND MULLION CONSTRUCTION
OF TURRET FRAME

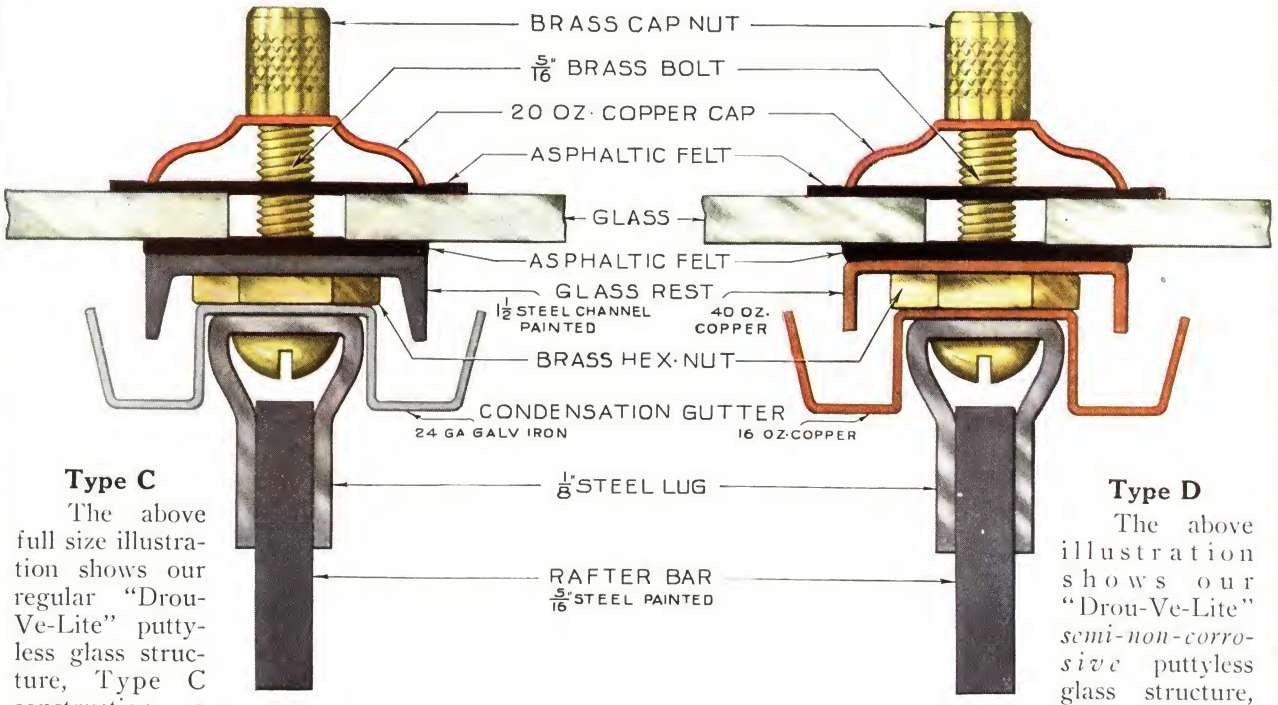


DROUVÉ TURRET VENTILATING SASH CONSTRUCTION

Drouvé turret sash construction complete with operating device as shown to the left and above is an exceptionally well built, durable ventilating medium. Turret sash construction is usually furnished with ventilating sash on the two long sides and stationary sash on the ends. It is also to be remembered that in using the turret sash construction under skylights you are obtaining considerably more light, as glass is used in turrets as well as skylight. The turret frame is made up entirely of structural tees and angles and special steel corner members. These members are all properly painted and exposed to the interior of the building only. All metal in these turrets exposed to the weather is of copper. Suitable operating device for the opening and closing of the turret sash is a part of this construction.

Note: It is not intended in the illustrations of ridge ventilator and turret sash to convey the impression that they are, necessarily, used together as a complete ventilating unit. They are two distinctly separate methods of ventilation. It is sometimes desired to use the ridge ventilator method or to use the turret sash method. It is not necessary to use the two together, although, in cases where maximum ventilation is desired, the combination of the two makes a perfect ventilating medium.

DROU-VE-LITE
GLASS STRUCTURE



Type C

The above full size illustration shows our regular "Drou-Ve-Lite" puttyless glass structure, Type C construction, a very satisfactory heavy duty skylight. It was originally placed on the market by us as a result of a very decided tendency on the part of architects to eliminate as much as possible structural steelwork for the support of the skylight itself. A skylight which is self-supporting, regardless of length of span, effects a considerable saving because it requires no structural steelwork for its support other than that which is a part of the skylight itself.

Another important feature is the freedom from unsightly steel trusses, etc., in the skylight well opening and the consequent elimination of shadows and obstruction of light.

Like our "Anti-Pluvius" construction, the basic principle in this construction is the elimination of condensation forming on the ribs or, as we call them, rafter bars, so prevalent in a wrongly constructed skylight. This is accomplished by our patented method of isolating the condensation gutter from the rafter bars, and glass rest again from the condensation gutters, permitting a free circulation of air between rafter bars and condensation gutters and between condensation gutters and channel shaped glass rest. In this construction the condensation gutters are of ample size to take care of all condensation and yet the over-all width of the condensation gutter, which is the widest point of light obstruction in this skylight, is only 2¼ in.

This skylight, Type C construction, is furnished, so far as materials are concerned, exactly as noted above. More detailed information and specifications for this skylight can be found on pages 7 and 8 following.

Type D

The above illustration shows our "Drou-Ve-Lite" *semi-non-corrosive* puttyless glass structure, Type D construction.

This skylight in design and construction is identical with Type C, the difference being only in the materials used. This type has all sheet metal parts, such as condensation gutters, glass rests, and all metal parts which are exposed to the weather, of copper. These features give non-corrosive materials where they are most needed.

For example, the glass rest will develop condensation due to its direct contact with the glass (felt or other glass rest cushions not being an insulator against this); this condensation, in turn, drops into the condensation gutters which are also of copper. These are the two parts of the skylight exposed to the interior of the building which are continually wet and dry but, nevertheless, being of copper, they are free from corrosion. Also, as stated above, metal exposed to weather, being of copper, is free from corrosion. Rafter bars are of steel, painted, and inasmuch as this construction prevents condensation forming on them, they are always dry and the life of them is indefinitely prolonged. It is also to be noted that the construction of "Drou-Ve-Lite" is such that the rafter bars, like other steelwork in the building, can be very readily and thoroughly painted from time to time without dis-assembling the skylight, a most important feature.

This skylight, Type D construction, is furnished, so far as materials are concerned, exactly as noted above.

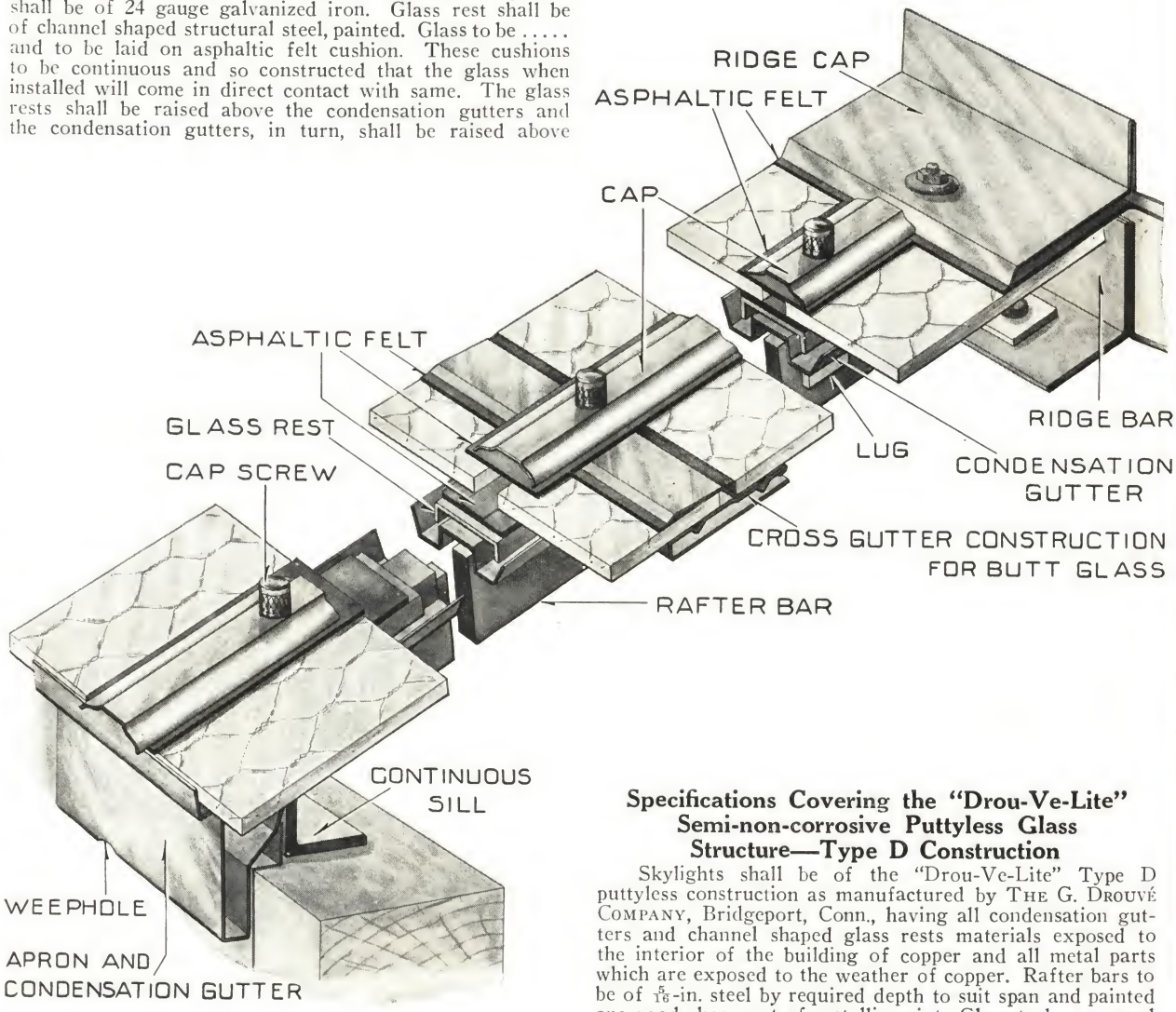
More detailed information and specifications for this skylight can be found on pages 7 and 8 following.

DROU-VE-LITE
GLASS STRUCTURE

Specifications Covering the "Drou-Ve-Lite" Puttyless Glass Structure—Type C Construction

Skylights shall be of the "Drou-Ve-Lite" Type C puttyless construction as manufactured by THE G. DROUVÉ COMPANY, Bridgeport, Conn., having all metal parts which are exposed to the weather of copper. Rafter bars to be of $\frac{5}{16}$-in. steel by required depth to suit span and painted one good shop coat of metallic paint. Condensation gutters shall be of 24 gauge galvanized iron. Glass rest shall be of channel shaped structural steel, painted. Glass to be ..... and to be laid on asphaltic felt cushion. These cushions to be continuous and so constructed that the glass when installed will come in direct contact with same. The glass rests shall be raised above the condensation gutters and the condensation gutters, in turn, shall be raised above the rafter bars a sufficient distance so that there will be a free circulation of air between the rafter bars and the condensation gutters and between the condensation gutters and the glass. Skylight caps will be so constructed as to allow for expansion, contraction and vibration.

Skylights shall be self-supporting without the use of any structural steel other than that steel which is a part of the skylight itself.

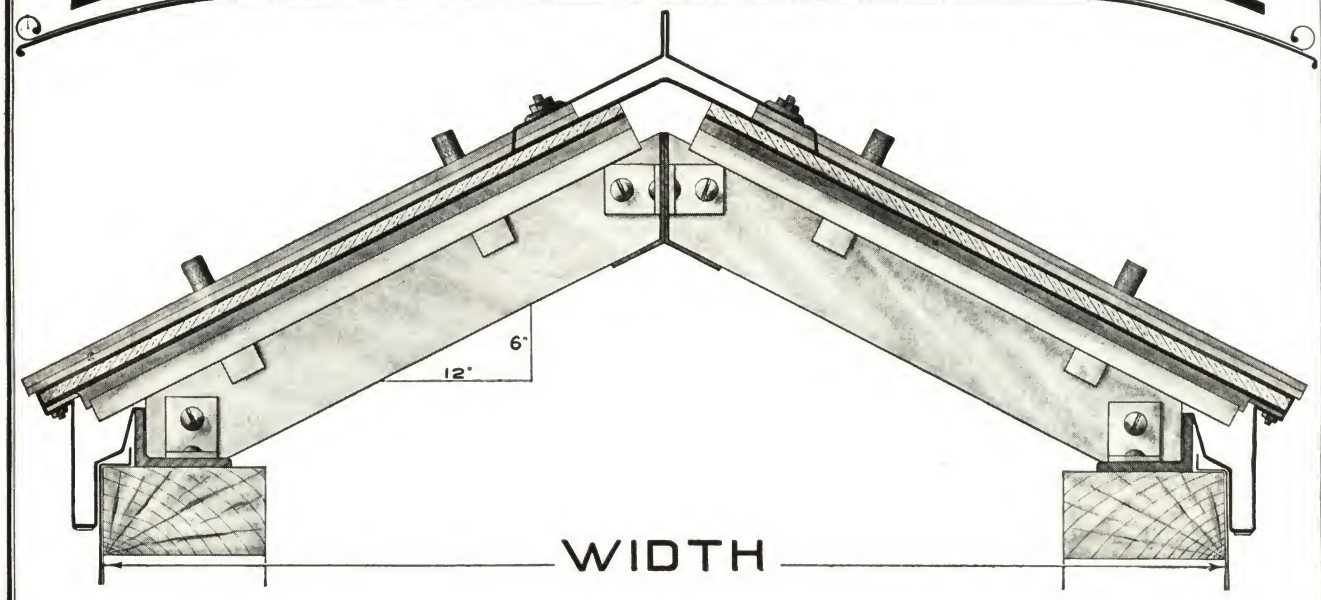


Specifications Covering the "Drou-Ve-Lite" Semi-non-corrosive Puttyless Glass Structure—Type D Construction

Skylights shall be of the "Drou-Ve-Lite" Type D puttyless construction as manufactured by THE G. DROUVÉ COMPANY, Bridgeport, Conn., having all condensation gutters and channel shaped glass rests materials exposed to the interior of the building of copper and all metal parts which are exposed to the weather of copper. Rafter bars to be of $\frac{5}{16}$-in. steel by required depth to suit span and painted one good shop coat of metallic paint. Glass to be .... and to be laid on asphaltic felt cushions, these cushions to be continuous and so constructed that the glass when installed will come in direct contact with same. The glass rests shall be raised above the condensation gutters and the condensation gutters, in turn, shall be raised above the rafter bars a sufficient distance so that there will be a free circulation of air between the rafter bars and the condensation gutters and between the condensation gutters and glass. Skylight caps will be so constructed as to allow for expansion, contraction, and vibration.

Skylights shall be self-supporting without the use of any structural steel other than that steel which is a part of the skylight itself.

DROU-VE-LITE
GLASS STRUCTURE



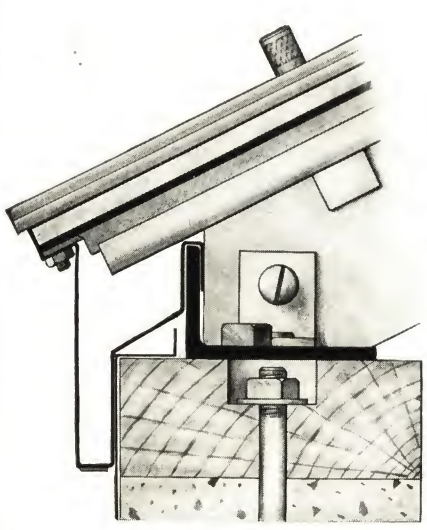
The above illustration shows a section through our "Drou-Ve-Lite" puttyless glass structure, either Type C or Type D construction. This skylight, regardless of width size up to a certain point, requires no structural steel trusses and purlins for its support.

Maximum width dimension with this skylight is 24 ft. Rafter bars in this structure are always $\frac{5}{8}$ in. thick but the depth of same varies to suit required span without deflection. We carry in stock always for use in this skylight $\frac{5}{8}$-in. rafter bars by 2, 2½, 3, 3½ and 4-in. depth. 4-in. depth bars are for skylights with width dimensions from 22 to 24 ft. With this variety in sizes we are in a position to give this skylight with correct size bar to adequately carry spans without any additional structural steel work.

Regarding the length of skylights, they can be of any length desired as our construction is not in any way affected by this.

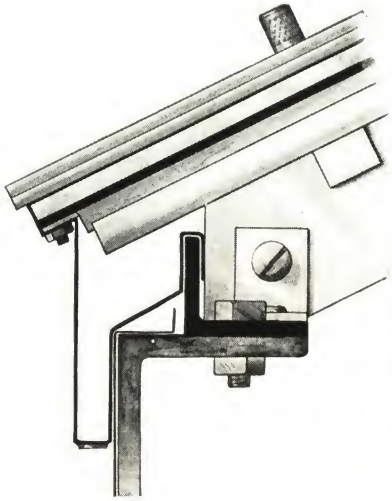
Our "Drou-Ve-Lite" puttyless glass structure possesses many advantages:

(1) This construction is entirely suitable for use over very small openings as well as exceptionally large ones, because the rafter bars are furnished proportionately to the size of the skylight.
(2) Easily adaptable to all types of roof construction.
(3) Positive watertightness.
(4) Sweating of rafter bars is eliminated.
(5) Admits maximum daylight and casts minimum shadows.
(6) Structure is an absolutely rigid unit when in place.



FLAT TOP CURB

BEVEL TOP CURB



STRUCTURAL STEEL CURB

The illustrations above show three different types of most generally used skylight curbs.

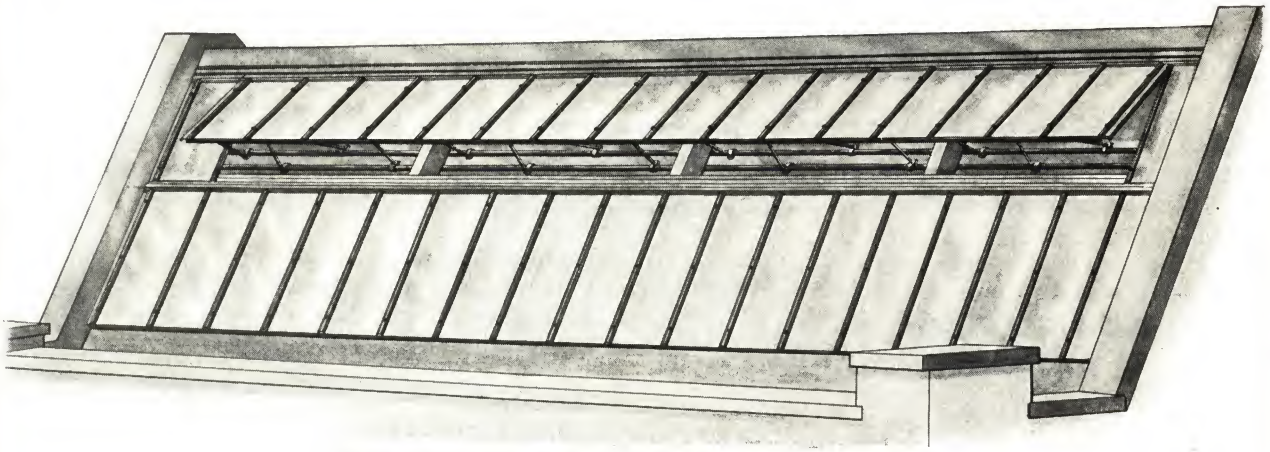
Concrete curbs should have wood plate on top, anchored to the curb as shown. Concrete curbs should not be less than 6 in. in thickness.

Wood curbs can be furnished either with bevel top as shown or flat top and should not be less than 4 in. in thickness.

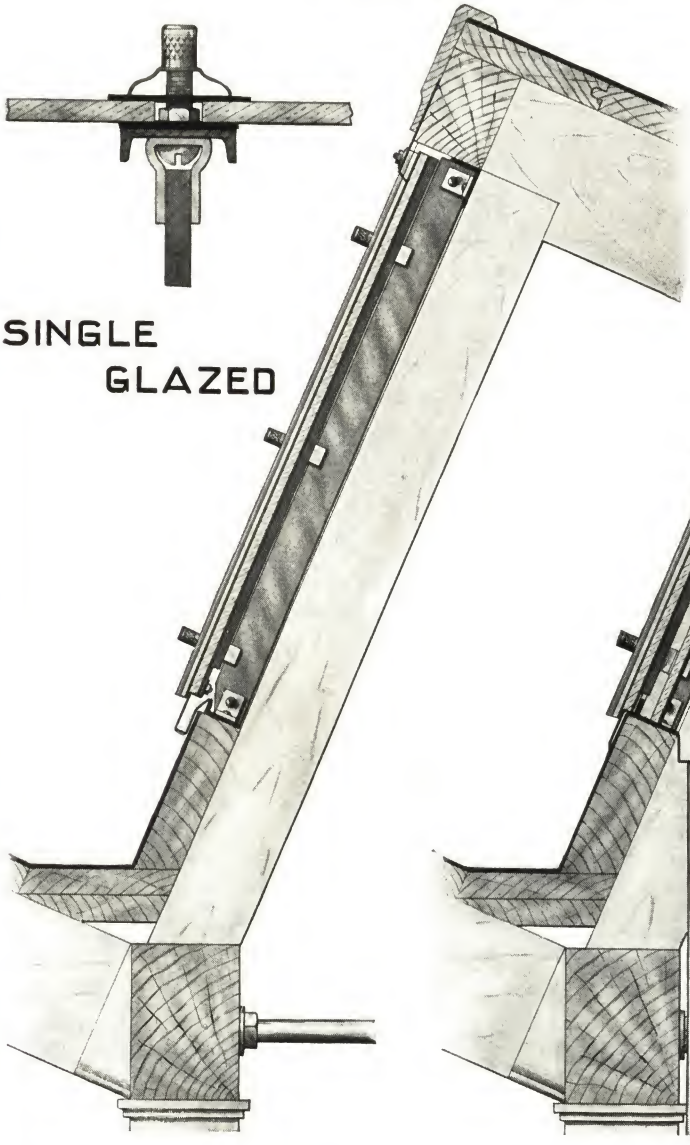
Structural steel curbs, made either from angles as shown or channels, should have a top leg or flange of not less than 3 in.

It is understood that the curbs are not a part of the skylight manufacturer's contract. These are always furnished by others. Also, the flashing of these curbs is not a part of the skylight contract but should be done by the roofing or sheet metal contractor.

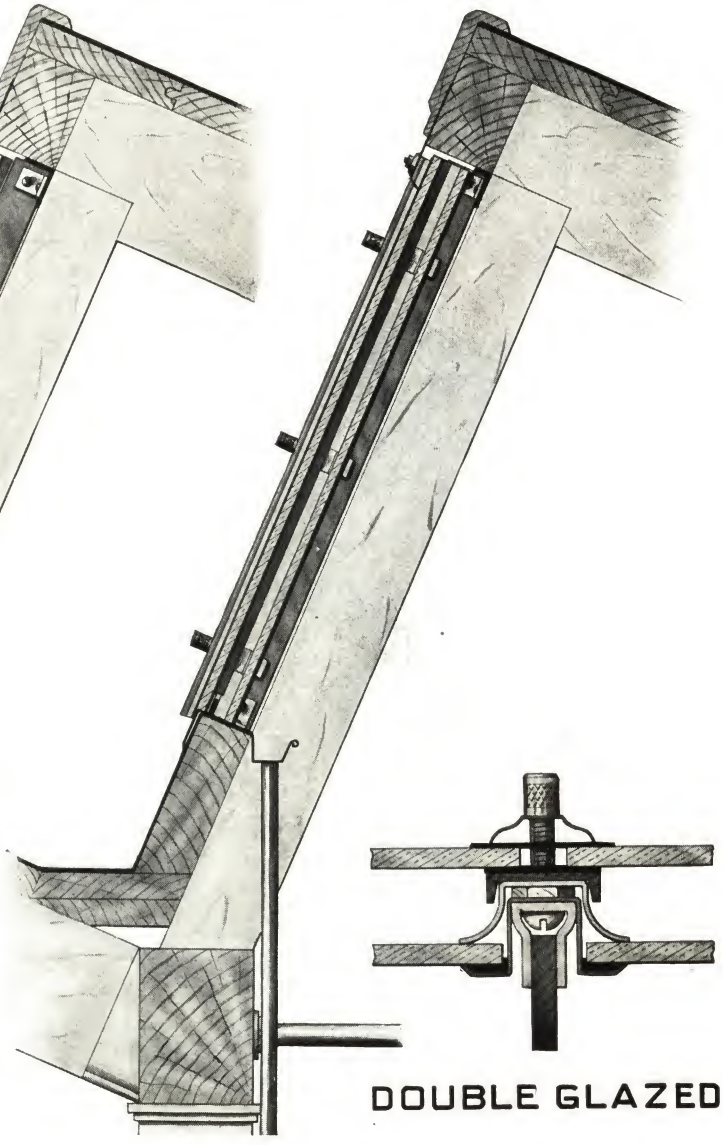
DROU-VE-LITE SAWTOOTH CONSTRUCTION



CONTINUOUS VENTILATING



SINGLE GLAZED



DOUBLE GLAZED

ESTABLISHED 1906

THE T. J. FLYNN METAL WORKS, INC.

Manufacturers of Skylights

TELEPHONES
University 10225-10226

6 Portland Street near Massachusetts Avenue
CAMBRIDGE, MASS.

Products

BUILT-RITE STRUCTURAL SKYLIGHTS; SHEET METAL SKYLIGHTS.

Also Roof Drains, Sheet Metal Work and Ventilators.

Built-Rite
TRADE-MARK

Features of Built-Rite Skylights

A study of the detail will show the many advantages of our design.

Adaptation of Types

For spans of less than 10 ft., sheet metal skylights are recommended. For spans exceeding 10 ft., T-bar skylights are most practical and economical. The salient points of advantage of our glass structure are as follows:

Rafter Bar—The bar is of T-iron, of size proportionate to span. Condensation is carried on independently of structural parts; a most important feature.

Curb—The thrust of the structure is taken by a continuous angle bolted directly to the bars without the use of clips.

General Features

(1) Size and weight of the bar are varied to suit exact conditions of span.

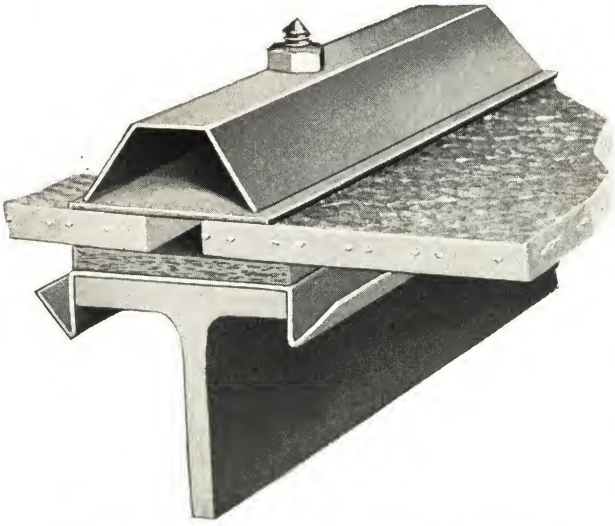
(2) Corrosionproof because condensation is eliminated *independently of the supporting rafters.*

(3) Cushioning of glass. Glass can be cushioned to suit individual preference—either on felt, heavy asphalt paper, or on special formed condensation gutter directly on thin edge of metal.

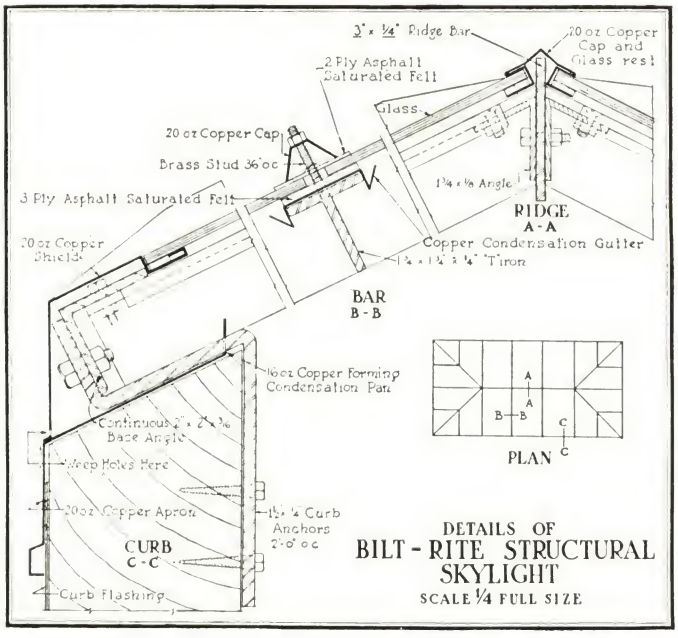
Consulting Service

This service furnished to architects without obligation.

We thoroughly analyze skylight problems, making correct recommendations for perfection of skylights.



Section of Bar, Built-Rite Structural Skylight



A Few Prominent Built-Rite Skylight Installations

BUILDING	LOCATION	BUILDING	LOCATION
U. S. Coast Guard Academy (Gymnasium)	New London, Conn.	Standard Oil Company	Cambridge, Mass.
Boston & Maine R. R. (Car Shops)	Concord, N. H.	Dahlquist Manufacturing Co.	South Boston, Mass.
Amoskeag Mills	Manchester, N. H.	Massachusetts School of Art	Boston, Mass.
Cambridge Hospital	Cambridge, Mass.	Boston Elevated (Fields Corner Terminal)	Boston, Mass.
Municipal Garage	Boston, Mass.	U. S. Post Office	Leominster, Mass.
Stevens High School	Claremont, N. H.	U. S. Post Office	Newburyport, Mass.

GENERAL SHEET METAL WORKS, INC.

Manufacturers of Cibulas Puttyless Skylights, Ventilators and Turrets

BRIDGEPORT, CONN.

NEW YORK OFFICE: 489 Fifth Avenue, Wm. J. Callahan, Mgr.

REPRESENTATIVES IN PRINCIPAL CITIES

CIBULAS PUTTYLESS SKYLIGHTS FOR SHORT AND LONG SPANS
(PATENTED)

No Water—No Ice—No Trouble

Cibulas Puttyless Skylights are built to take care of practically any condition of installation of any reasonable length of span. They are made in two different types. One type for short spans as shown below, without reinforcement, the other for spans of practically any length, reinforced with a special rolled steel channel made in varying lengths of legs to take the span.

They are also made in copper, aluminum and copper bearing galvanized iron. They are furnished with or without ventilation for hip, turret, sawtooth, double pitch, single pitch and marquise skylights. They are glazed with either ribbed or rough, plain or wire glass, or actinic glass. When desired, our engineers will furnish complete detail drawings and estimates without obligating the architect.

A list of installations will be gladly sent on request.

CIBULAS SKYLIGHTS FOR SHORT SPANS—NON-FREEZING, PUTTYLESS

Skylights for Straight Spans up to 10 ft. and for Hip Type Spans up to 16 ft.

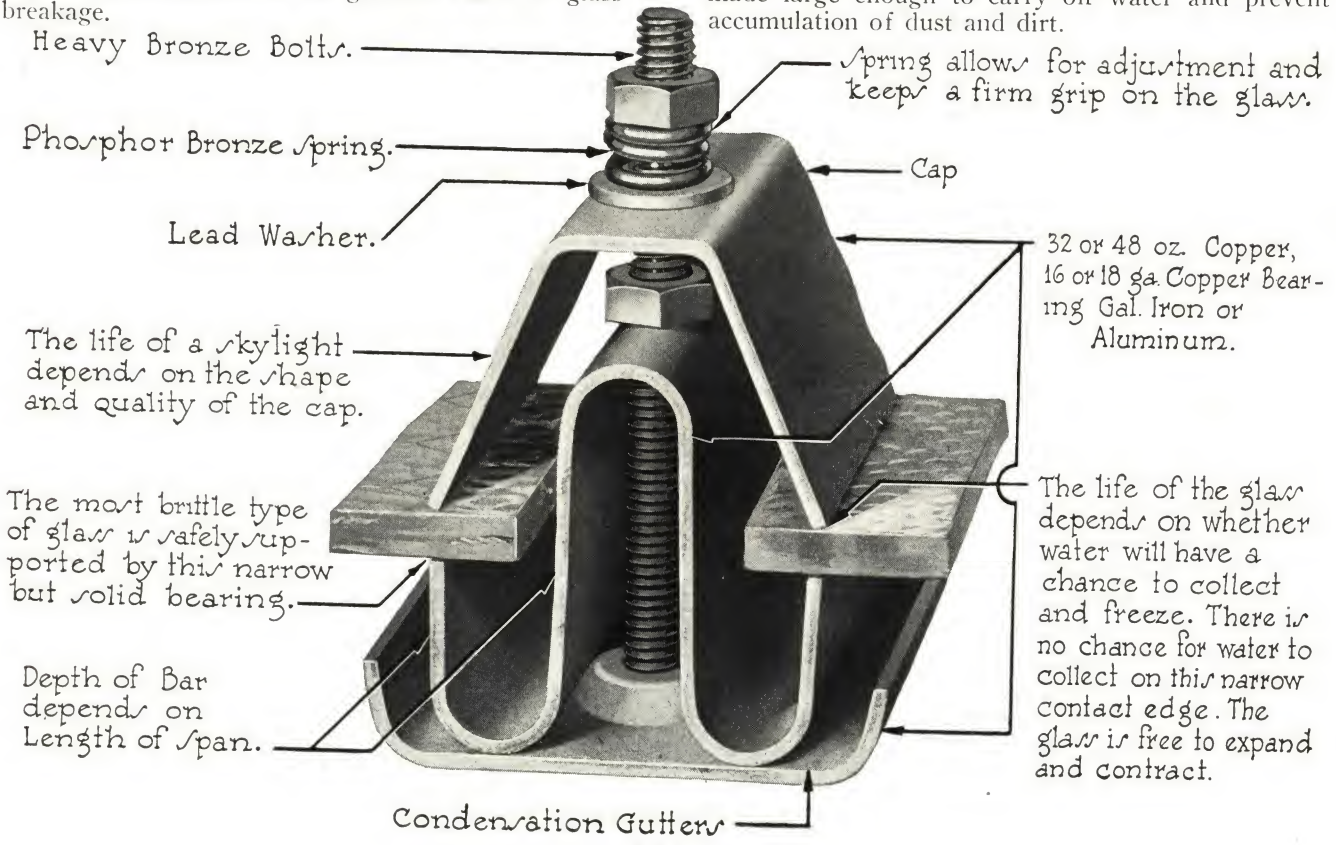
This skylight is the type we recommend for all ordinary spans. It has been tested for years and has a record of the highest character. The breakage of glass is reduced to a minimum through the elimination of possible collection of water and its freezing. There is no chance for capillary attraction of water due to the thin but firm bearing of the metal. The glass is free to expand and contract at all times. The freezing of water on skylights and the inability of the glass to expand and contract is the greatest cause of glass breakage.

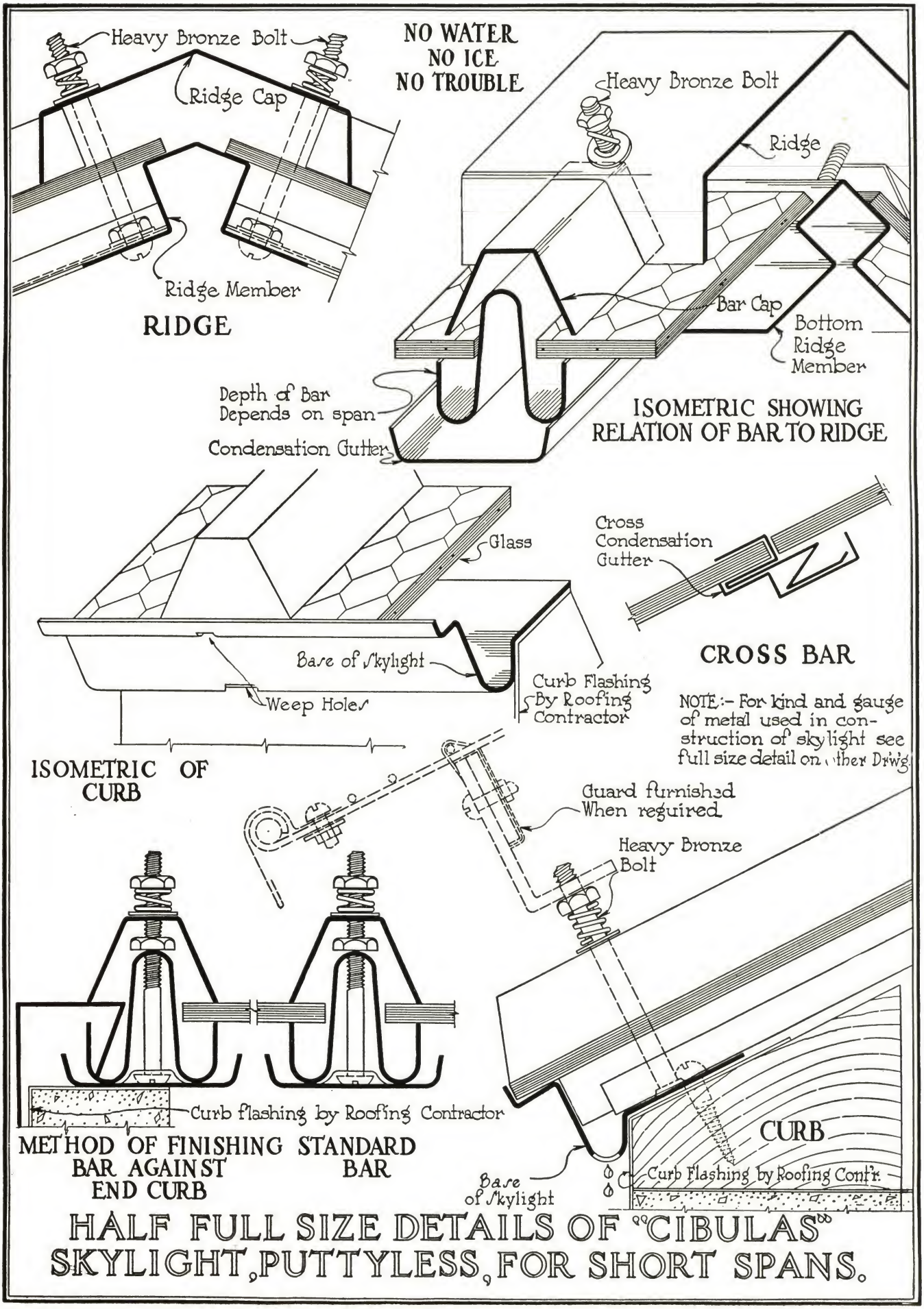
Special Features

The skylight bar as shown below is made of heavy gauge, non-corrosive metals, No. 18 or 16 gauge copper, aluminum or galvanized copper bearing iron as desired or specified. It is designed for each job to support 35 or 40 lb. per sq. ft. to take care of snow or wind loads, the depth of the bars varying with the span.

These bars are perfectly weathertight.

They dispose of all condensation. Gutters are made large enough to carry off water and prevent accumulation of dust and dirt.





HALF FULL SIZE DETAILS OF "CIBULAS" SKYLIGHT, PUTTYLESS, FOR SHORT SPANS.

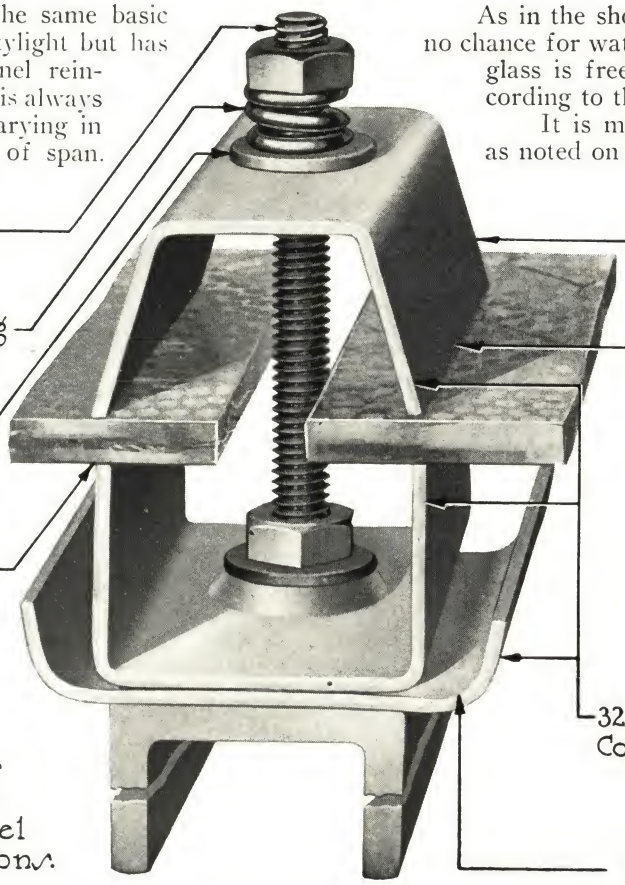
CIBULAS STRUCTURAL SKYLIGHTS FOR ANY SPANS—NON-FREEZING, PUTTYLESS

No Water—No Ice—No Trouble

This skylight is built on the same basic principles as our short span skylight but has the advantage of a steel channel reinforcement. The bar section itself is always standard, the channel section varying in depth according to the length of span.

As in the short span skylight bar there is no chance for water to collect and freeze. The glass is free to expand and contract according to the temperature.

It is made of non-corrosive metals, as noted on the drawing.



SUGGESTED SPECIFICATIONS FOR "CIBULAS" PUTTYLESS SKYLIGHTS AND TURRETS

Furnish and erect where shown on plans "Cibulas" Puttyless Skylights and Turrets as manufactured by the GENERAL SHEET METAL WORKS, INC., of Bridgeport, Conn. All parts to be of No. 18 gauge rust-resisting metal throughout, assembled with $\frac{5}{8}$-in. bronze bolts and nuts and phosphor bronze springs to take care of expansion and contraction. No packing of any kind to be used in connection with the glazing. Skylights shall be glazed with ribbed or rough plain glass, or ribbed or rough wire glass.

For copper-trimmed construction, use the above specifications with the exception of caps to be 18-oz. copper and all parts not exposed to the weather to be painted one shop coat of first class metal protective paint.

For all copper construction, use 48-oz. copper for supporting members and 18-oz. copper for the caps.

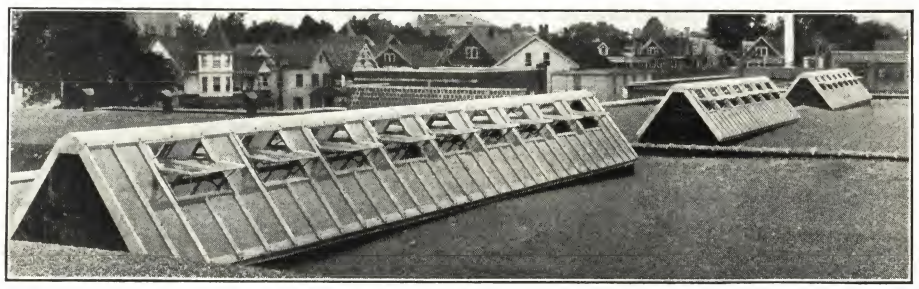
For all aluminum construction use aluminum $\frac{1}{8}$ in. thick throughout, assembled with $\frac{5}{8}$-in. aluminum bolts and nuts. The springs to be of phosphor bronze.

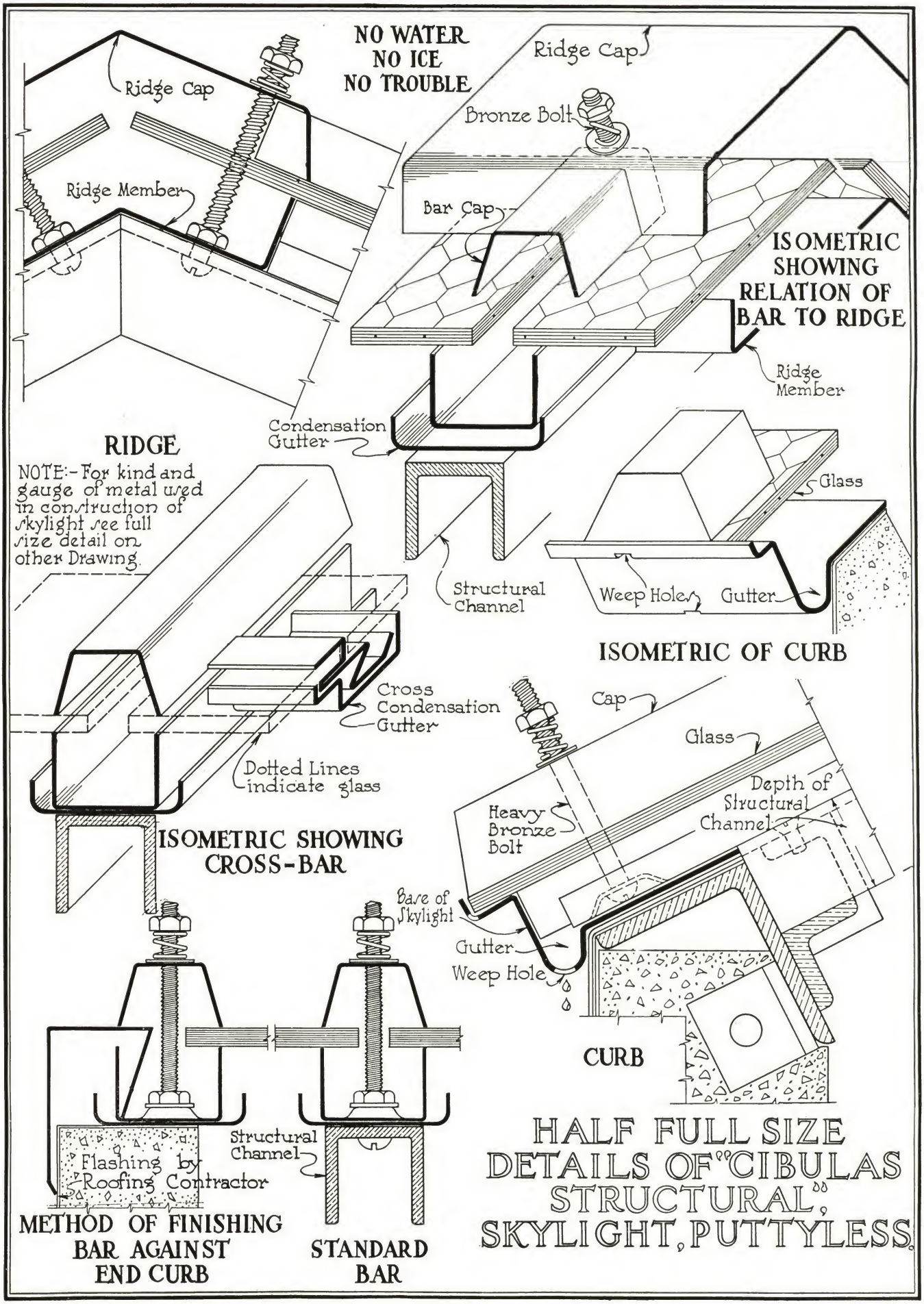
CIBULAS "AIR-LIGHT" SKYLIGHTS

For Lighting and Ventilating Large Areas

Special Features

1. Made of heavy gauge galvanized iron, copper and aluminum.
2. Puttyless construction.
3. Provided with condensation gutters.
4. No chance for snow to lay on to shut out light.
5. Will last two to three times longer than the ordinary skylight.
6. Maintenance expense eliminated.
7. Most ventilation can be obtained.
8. Break between sash helps air circulation.
9. No peak pocket for smoke or foul air to collect.
10. Vent sections high from roof minimizing dust and dirt from sweeping in.
11. Pressed steel operating device with phosphor bronze joints.
12. Easy to operate.
13. Takes 10 pulls or 10 seconds to operate.
14. Counterbalanced sash makes for ease in operation.
15. Once installed, no further worry or expense.




NO WATER
NO ICE
NO TROUBLE
Ridge Cap
Ridge Member
RIDGE
NOTE:-For kind and gauge of metal used in construction of skylight see full size detail on other Drawing.
Ridge Cap
Bronze Bolt
Bar Cap
ISOMETRIC SHOWING RELATION OF BAR TO RIDGE
Ridge Member
Condensation Gutter
Structural Channel
Glass
Weep Hole
Gutter
ISOMETRIC OF CURB
Cross Condensation Gutter
Dotted Lines indicate glass
ISOMETRIC SHOWING CROSS-BAR
Cap
Glass
Depth of Structural Channel
Heavy Bronze Bolt
Base of Skylight
Gutter
Weep Hole
CURB
Structural Channel
Flashing by Roofing Contractor
METHOD OF FINISHING BAR AGAINST END CURB
STANDARD BAR
HALF FULL SIZE DETAILS OF "CIBULAS STRUCTURAL" SKYLIGHT, PUTTYLESS.

"CIBULAS" PUTTYLESS TURRETS

After much experimenting, the GENERAL SHEET METAL WORKS, INC. have succeeded in developing a puttyless turret which is enduring and, to all practical purposes, faultless. Here are some of the many good features of this construction:

Heavy gauge galvanized iron, aluminum or copper.

Two to three times heavier metal than ordinary construction, thus can be built larger without structural steel framing.

Rain and weather proof. No putty, packing or solder used.

Center pivoted sash, counterbalanced.

Greatest amount of ventilation.

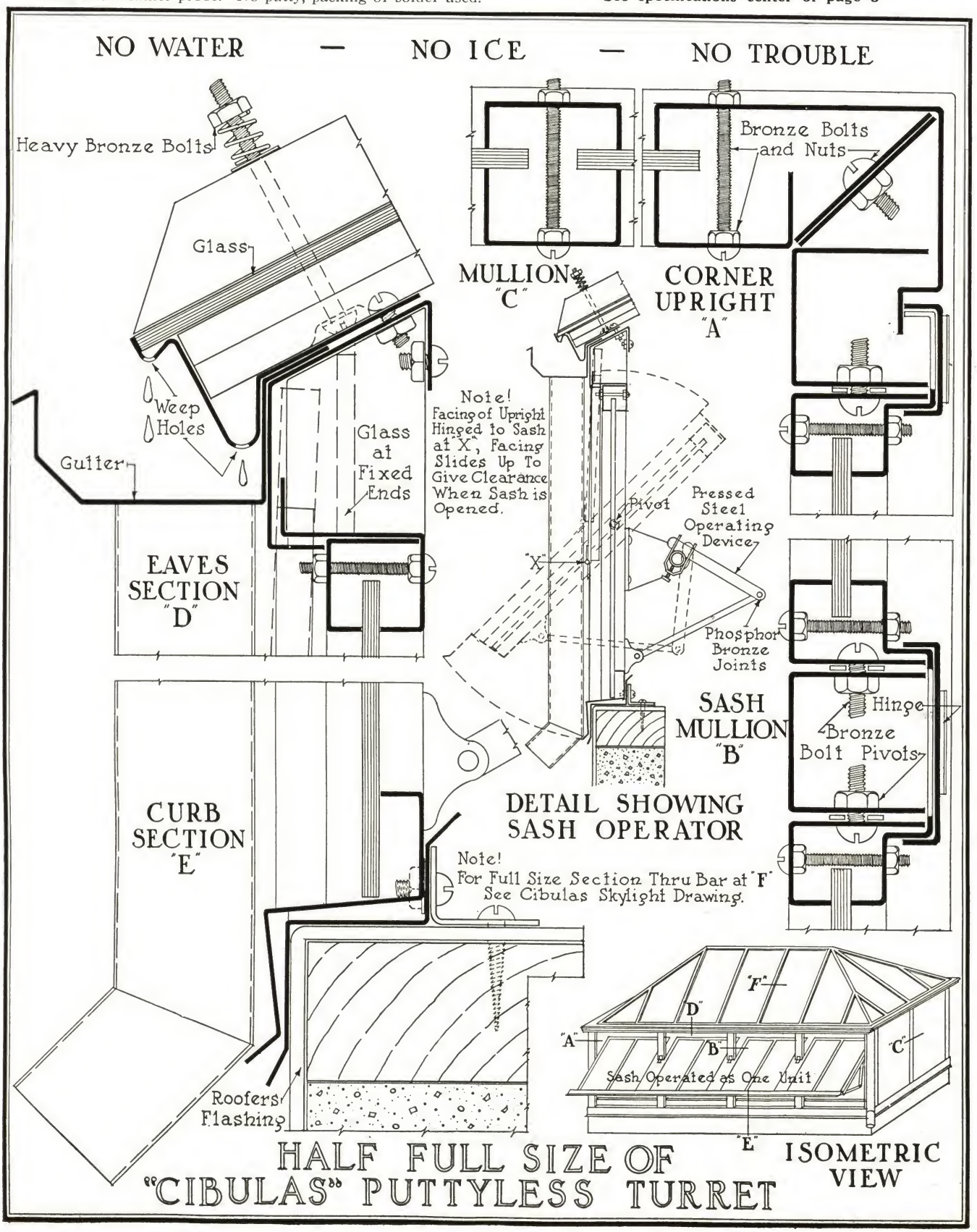
Can be controlled from minimum to maximum ventilation.

Easy in operation, opens in ten seconds.

Principal parts of operating device of pressed steel.

Movable joints of operating device have phosphor bronze bushings.

See specifications center of page 3



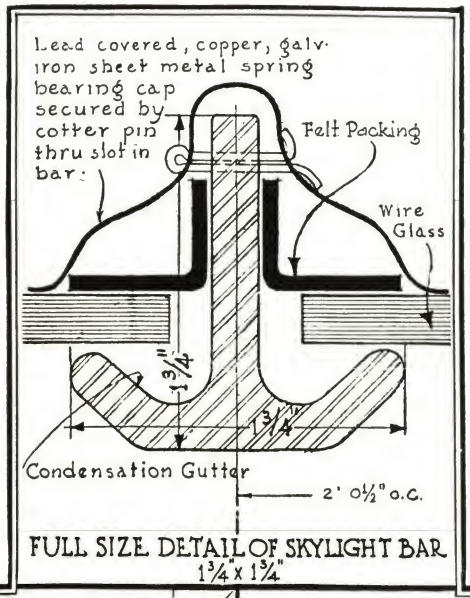
THE HOWIE COMPANY, INC.

9011 Central Avenue, DETROIT, MICH.

Products

PEERLESS SKYLIGHTS.

Also manufacturers of Fireproof Windows, Tin Clad and Metal Covered Doors, approved by Underwriters' Laboratories, Inc.; Copper and Bronze Doors, Architectural Sheet Metal Work.



FULL SIZE DETAIL OF SKYLIGHT BAR 1¾" x 1¾"

Peerless Skylight, Sawtooth and Marquise Constructions

These are designed to provide a weatherproof and dustproof skylight construction and one guaranteed against any and all possible glass breakage due to vibration, or through expansion and contraction due to temperature changes.

Specifications for Peerless Skylight and Marquise

Intent—This specification together with the accompanying drawings and details is intended to provide for all labor and material required for the completion and erection of all skylights as shown or mentioned.

Work by Others—All steel framing, wood curbs, nailing strips, gutters and roof flashings, shall be provided for under another contract, unless otherwise specified.

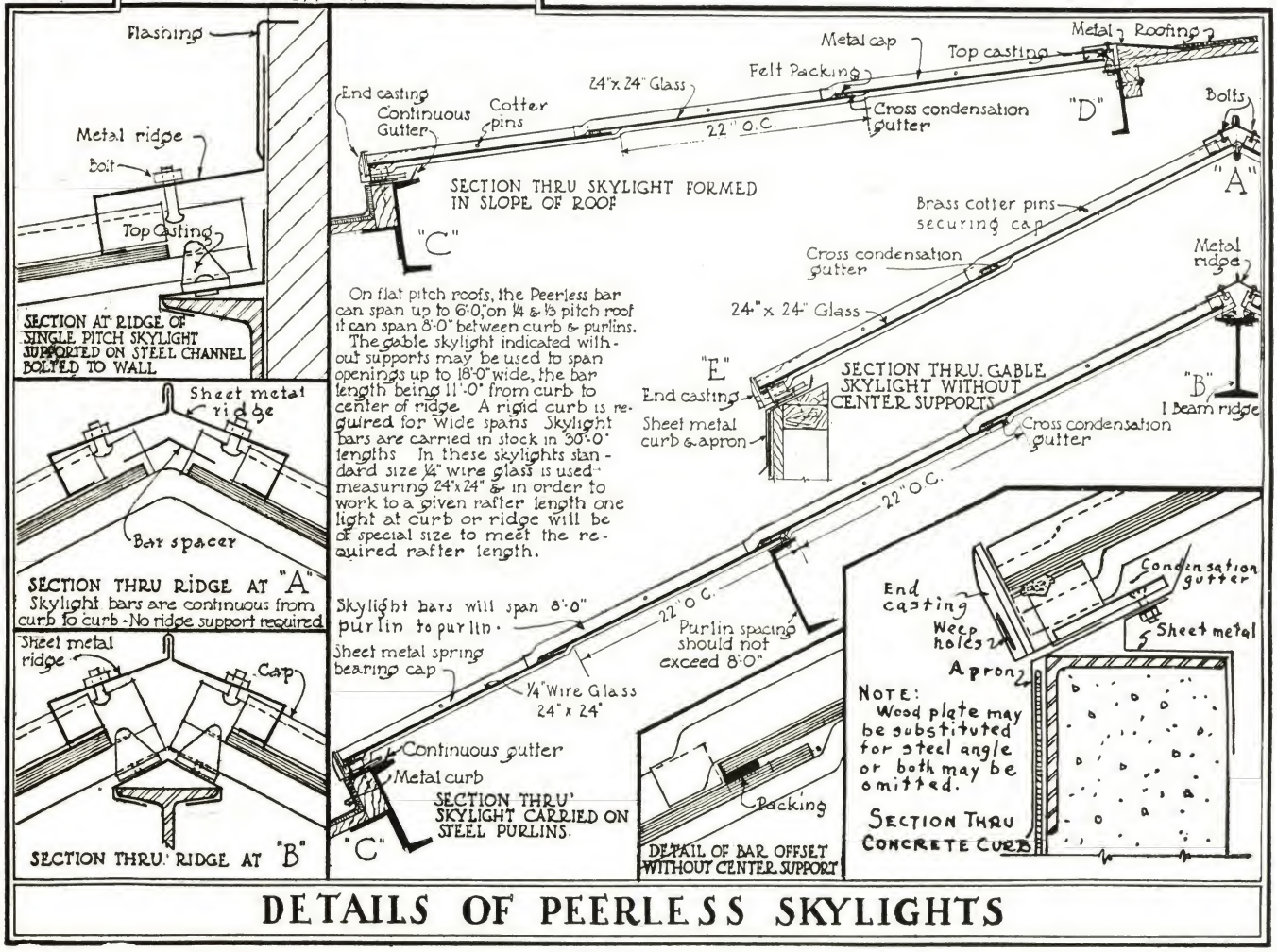
Work Required—Provide and install all skylights as shown or indicated on drawings. All skylights shall be "Peerless" skylight construction as manufactured by THE HOWIE COMPANY, INC., Detroit, Mich., complete as shown by their standard details, and adapted to the construction of the building.

All sheet metal trimming shall be of No. 24 gauge galvanized iron [or 16 oz. cold rolled copper] [or No. 11 zinc].

Glazing—All skylights to be glazed with best quality ¼-in. rough wire glass not to exceed 24 in. in width. All glass to be left whole and clean at completion of the work.

Painting—All metal work in connection with skylight, except copper or zinc, shall be painted; also paint all skylight bars with 1 good coat of approved paint.

Guarantee—This contractor is to furnish a written guarantee for 5 years.



DETAILS OF PEERLESS SKYLIGHTS

AUGUST KUHNLA, INC.

Manufacturers of Skylights

TELEPHONE
Williamsburgh 5-3230, 31

10 to 20 Lorimer Street
BROOKLYN, N. Y.

ESTABLISHED OVER
HALF A CENTURY

Member of N. Y. Building Trades Employers' Association

Products

"KuPe" Automatic Stage Ventilators; "KuPe" Automatic Ventilating Skylights.

Also "KuPe" Better Standard Non-automatic Skylights.

KuPe
TRADE-MARK

When Specifying

Architects in specifying should mention skylight number to avoid misunderstanding in type desired.

Catalogue

Supplementary illustrated sheet for complete list of automatic and non-automatic skylights mailed on request.

Patents

"KuPe" Automatic Skylights and Ventilators are protected under various U. S. Letters Patent and the trade-mark "KuPe" is registered. Any infringement of patent or trade-mark rights, either in whole or in part, will be prosecuted.

Guarantee

All genuine "KuPe" products bear the trade-mark "KuPe", signifying excellence of workmanship and material assured by the long creditable reputation of a reliable manufacturer.

Estimates

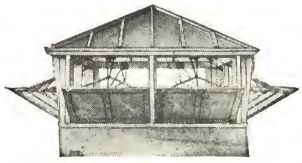
Price lists are not available for general distribution, owing to fluctuation of material prices, etc. Quotations made upon application for specific jobs will be found extremely reasonable, considering the high grade product and service offered.

Inquiries

When writing, please mention job, location and architect in order to facilitate proper filing and closer estimating.

"KuPe" Standard Automatic Stage Ventilator No. 67

For Theatres, Schools, Auditoriums, etc.



"KuPe" Standard Automatic Stage Ventilator No. 67
(Patented)

A combined ventilator and weatherproof skylight. It consists of a metal frame with hipped glass roof, and sides provided with bottom hinged metal shutters. Flexible bronze cable equipped with fusible links passes over brass pulleys and connects the top of each shutter to a main rope which extends down to the stage floor. This main rope is also provided with fusible links. Under ordinary conditions the shutters are hand operated, but in times of emergency the shutters may be quickly opened by cutting the rope; in case of fire the operation of the shutters is effected either individually or simultaneously by the melting of said fusible links.

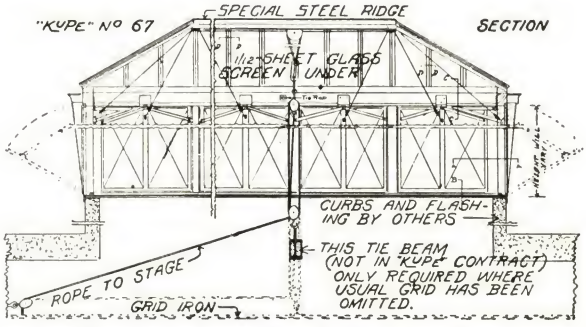
This is a scientifically constructed, efficient, self-opening ventilator, proof against obstruction by ice or snow, and positive in action under all conditions.

Construction and Installation—We manufacture and install these ventilators to any dimension, complete, glazed with ½-in. sheet glass and equipped with woven wire screen under the glass. We use standard gauges of galvanized steel (or copper) and the shutter hinge plates and pins are of brass.

Indorsement—Approved by the Board of Fire Underwriters, Departments of Labor, city officials, architects and owners.

Installations—Prominent theatres, high schools, parochial schools, public auditoriums, Masonic temples, etc., throughout the country, are now equipped with the "KuPe" Stage Ventilator; list of these installations will be gladly furnished on application. For immediate reference a partial list of recent installations follows:

Building and Location	Architect
Loew's Triboro Theatre, New York, N. Y.	Thomas W. Lamb
Warner Bros. Theatre, Erie, Pa.	C. W. & G. L. Rapp
Mississippi Theatre, Davenport, Iowa	A. S. Graven, Inc.
Capitol Theatre, Aberdeen, S. D.	Kenneth M. Fullerton
Auditorium-University of N. C., Chapel Hill, N. C.	Atwood & Nash
Consistory Cathedral, Collingswood, N. J.	W. W. Sharpley
Elks Home Auditorium, Danbury, Conn.	Ph. N. Sunderland
George F. Baker High School, Tuxedo Park, N. Y.	Guilbert & Betelle
Thos. Jefferson Senior High School, San Antonio, Tex.	Adams & Adams
Senior High School, Lynn, Mass.	Sanborn & Weed
Battle Hill School, White Plains, N. Y.	Starrett & Van Vleck
Lew Wallace School, Gary, Ind.	Wm. B. Ittner, Inc.



"KuPe" Standard Automatic Stage Ventilator No. 67
(Patented)

Note: Shutter openings will vary in height to conform with area of skylight shaft.

Outline Specification for "KuPe" Stage Ventilator

The ventilator skylight over the stage shall be a "KuPe" No. 67 Combined Ventilator and Skylight as manufactured by August Kuhnla, Inc., of 10-20 Lorimer Street, Brooklyn, N. Y., automatic in case of fire and adjustable by hand for ordinary purposes.

All metal shall be of No. 24 galvanized iron (or 16-oz. C. R. copper).

The sides of ventilator shall have well constructed corners and mullions with openings fitted with metal ventilating doors. The doors shall be hinged at bottom with brass hinges and shall swing out, leaving an absolutely unobstructed passage for gases, smoke and foul air.

Connecting the upper part of each door with the head jamb there shall be a combined jack knife bracket and check arm arrangement to act as a lever in thrusting doors outward, and at the same time preventing the doors from opening beyond a certain point, as well as holding same rigid against wind when open.

The doors shall be operated by flexible cable running over brass wheel pulleys attached to fusible links, which in turn shall be controlled by a main rope or set of ropes that shall be carried down to a point where they can be conveniently operated from the floor.

The roof of ventilator skylight shall be of hip design, with heavy bars and condensation gutters, glazed with plain sheet glass, and shall have wire guards placed under same.

All shall be made and installed subject to the approval of the Board of Fire Underwriters and departments having jurisdiction over same.

NATIONAL VENTILATING COMPANY

Manufacturers of Puttyless Skylights

GENERAL OFFICE AND FACTORY
10-15 46th Avenue
LONG ISLAND CITY, N. Y.

TELEPHONE
STillwell 4-5733, 5734

Products

MULTI-UNIT PUTTYLESS SKYLIGHTS.

Also manufacturers of Side Lights, Operating Sash, and National Ventilating Devices; all kinds of Sheet Metal Products; Drawing and Stamping.

Adaptability

Skylights for railway terminals, power stations, machineshops, factories, foundries, libraries, museums, art galleries, and all other buildings whereon permanent watertight skylights of large area are required.

Advantages and Distinctive Features

Referring to Fig. 4 on following page, the bar and upper lights are supported in a fixed manner by the purlin thereunder; while the lower bar, supporting the lower lights, is secured by the same purlin in a loose manner, permitting it to expand freely.

This construction, being repeated at each purlin, permits movement all in same direction, due to expansion, contraction, or vibration (along the slope of the skylight) of the cap, glass and bar of each unit or tier of glass, independently of every other unit or tier.

Along the longitudinal line of the skylight the steel frame of the building and the entire length of the glass are each taken as separate units, and the difference, nearly 100%, in the expansion and contraction of these materials (glass and steel) is likewise thoroughly taken care of by the copper spreader clips shown in transverse section at supporting bar (Fig. 2). These spreader clips are placed over each cap bolt, spaced about 10 in. along each skylight bar, and incidentally they serve also to better secure in place the brass bolts for holding the caps.

The cap is strong and yet resilient. Its upper half is of an inverted "U" shape, which provides strength and rigidity; while the lower half, especially at the lower extremities, is resilient, so as to conform thoroughly, when secured in position, to the surface of the glass.

All gutters and parts that are non-accessible, without removing the glass, are of non-corrodible material. The entire top of the bar is covered with 8-oz. copper, the same being applied while the last coat of bar-paint is still wet; and a flexible bearing for the glass is formed, which adjusts itself to any warps or irregularity of the glass along its bearing line.

The company is equipped to cover the bottom of the bar also. Both the top and bottom bar covers are made by special dies and both fit the bar snugly.

No packing or filling substance of any kind is required, and no material is used other than glass and metal.

Standard Specification, Multi-unit System Puttyless Skylights

All curb and roof flashings shall be included under heading "Sheet Metal Work." They must be well connected, ready to receive the skylight work, and must include all necessary counter flashing, well secured to roof flashings and made water-tight.

The skylights shall be of the puttyless type, of a design to allow for free expansion and contraction, or movement due to vibration, of the glass and supporting bars in line with the pitch of roof, *all in the same direction.*

Each light of glass shall be entirely independent of every other light, so that one light does not support another; and the glass shall be held laterally in a manner to prevent its coming in contact with any rigid part.

The bearing for the glass shall be flexible, so as to adjust itself to any warps or irregularities of the glass along its bearing line.

The caps shall be spring bearing, in order to thoroughly conform along the lines of contact, when secured in position, to the surface of the glass.

All bar gutters shall be of copper and all exposed parts other than sheet metal shall be of brass.

The supporting bars shall be of rolled steel, and shall be held in a loose manner at the upper end and in a fixed manner at the lower end.

Packing, filling substance of whatever kind, or material other than glass and metal shall not be used.

All skylight sheet metal work shall be [copper] [zinc] [galvanized iron].

The glass shall be ⅜ in. thick [wire] [plain] [ribbed].

Adopted by Leading Railroads

The Pennsylvania Railroad Company, after carefully examining all other types of puttyless skylights in actual service, adopted the construction herein shown and described for its new New York & Long Island Railroad Passenger Station, 31st to 33d Streets and 7th and 8th Avenues, New York City, on which building this company completed, over 15 years ago, the erection of 83,000 sq. ft. of skylight, embracing nearly every known variety, such as hipped, ridge, flat, barrel-roof, sawtooth with bowed ridges, circular, elliptical, etc., all constructed with flat glass.

The Central Railroad of New Jersey adopted this system of skylights for its new terminal at Jersey City, N. J., where 116,000 sq. ft. of this construction has been installed.

Fig. 1. Group of Multi-unit Skylights Over Concourse of Pennsylvania Terminal, New York, N. Y.

Area of this group, about 50,000 sq. ft. Total area on the terminal, 83,000 sq. ft.

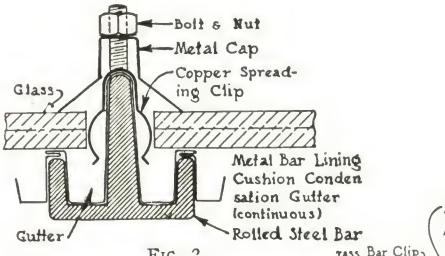


FIG. 2

Half Sized Transverse Section at Skylight Supporting Bar
(Patents applied for)

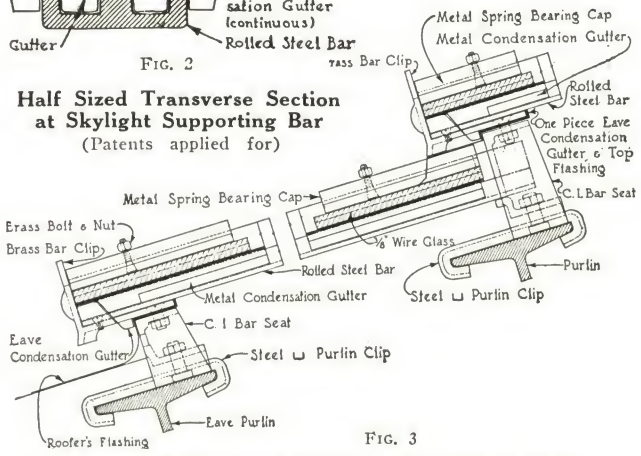


FIG. 3

Reduced Scale Cross Section from Eave to Next Purlin Above
(Patents applied for)
Construction shown on the right side is repeated at each purlin between the eave and the ridge
Scale, 2 in. equals 1 ft.

The New York Central Railroad Co. also has this construction on its new Grand Central Terminal at 42nd Street, New York City; on its New York City Power House at 50th Street and Lexington Avenue; Power Stations at Yonkers and Port Morris, N. Y.; Boiler Shops at West Albany, N. Y., Reed & Stem, Architects, and for their new Passenger Station at Utica, N. Y., Stem & Fellheimer, Architects.

Result of Thorough Investigation

The system of skylight construction described here is the result of experience and investigations made by the NATIONAL VENTILATING COMPANY in this line over a period of nearly 20 years.

All efforts during this time have been directed to producing, not the cheapest, but the best construction. As to skylights, true economy does not consist in buying the cheapest.

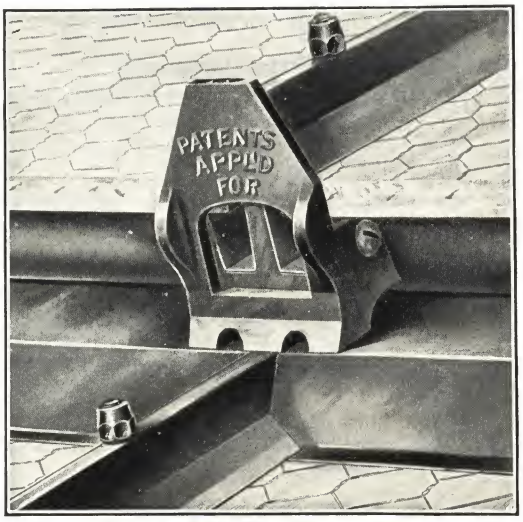


Fig. 4. Half Sized Perspective
Showing exterior view over each purlin between the eave and the ridge

Public Buildings and Other Notable Installations

The following are a few, among many, installations made by this company during the past 24 years; in some cases replacing other work with the new and improved system above described. They include building, location and architect.

New Library Building, Bar Harbor, Me., Delano & Aldrich
Sun Parlor for E. Parmalee Prentice, New York, N. Y., Delano & Aldrich
International Paper Co. Mills at Niagara Falls, Palmer and Fort Edward, N. Y., and Rumford Falls and Chisholm, Me
Maryland Institute, Baltimore, Md., Pell & Corbett
Auditorium Building, Springfield, Mass., Pell & Corbett
Municipal Building, Springfield, Mass., Pell & Corbett
New York Edison Co. Waterside Power Station, New York, N. Y.
U. S. Navy Yards at Norfolk, Va., Charlestown, Mass., Brooklyn, N. Y., Pensacola, Fla., and Washington, D. C.
Brooklyn Rapid Transit Co. Shops, Maspeth, N. Y.
American Steel & Wire Co. Mill, Worcester, Mass.
Terminal Passenger Station, Norfolk, Va., Reed & Stem
New York Stock Exchange Building, New York, N. Y.
New U. S. Post office, New York, N. Y., McKim, Mead & White
New Municipal Building, New York, N. Y., McKim, Mead & White
Munsey Building, Washington, D. C., McKim, Mead & White
Brockton Library, Brockton, Mass.
New York, Westchester & Boston R. R., Quaker Ridge Station, New Rochelle, N. Y., and 180th Street Station, Bronx, N. Y., Stem & Fellheimer.
United Electric Light & Power Co. Powerhouse, 201st Street Station, New York, N. Y.
Institute of Arts and Sciences, Brooklyn, N. Y., McKim, Mead & White
The Beaver Companies' Mill, Thorold, Ont., Canada
Museum of Fine Arts, Minneapolis, Minn., McKim, Mead & White
Administration Building, Balboa, Canal Zone, Panama
Metropolitan Museum of Art Building, Sections "J" and "K," New York, N. Y., McKim, Mead & White
Robert Brewster's Enclosed Tennis Court at Mount Kisco, New York, Walter D. Blair
Enclosed Pastime Tennis Court, Long Island City, N. Y., Walter D. Blair
Ford Motor Co. Service Building, Long Island City, N. Y.
Union Passenger Station, Macon, Ga., Alfred Fellheimer
John J. Raskob's Residence, Claymont, Del., McClure & Harper
Buffalo General Electric Co., 1917 River Station Extension, Black Rock, N. Y., Stone & Webster, Engineers
American Tobacco Co. Building, Brooklyn, N. Y., Francisco & Jacobus
American Can Co. Building, Brooklyn, N. Y., N. M. Loney
U. S. Naval Operating Base, Hampton Roads, Va.
National City Bank, New York, N. Y.
Trenton Bank Building, Trenton, N. J., Dennison & Hirons
Commodore Hotel, New York, N. Y., Warren & Wetmore
Amherst College Library, Amherst, Mass., McKim, Mead & White
Standard Oil Company, Devoe Works, Long Island City, N. Y.
Kwang Tung Electric Supply Co. Building, Canton, China
U. S. Assay Building, New York, N. Y.
Westinghouse Electric Co. Warehouse, Essington, Pa.
S. W. Straus Building, New York, N. Y., Warren & Wetmore
Continental Can Co., Jersey City, N. J., Francisco & Jacobus
Empire City Bank, New York, N. Y., Trowbridge & Livingston
New York Telephone Co., 6 Central Exchange Buildings, McKenzie, Voorhees & Gmelin
S. W. Straus & Co. Building, Chicago, Ill., Graham, Anderson, Probst & White
Paterson Paper Parchment Co., Edgerly, Pa., Abbott, Merkt & Co.
Federal Sugar Refining Co., Yonkers, N. Y., Dwight P. Robinson Co.
Tryon Art Gallery, Northampton, Mass., Frederick L. Ackerman
Fine Arts Building, Geo. Peabody College, Nashville, Tenn., McKim, Mead & White
Kleinberger Art Gallery, 12 East 54th Street, New York, N. Y., Harry Allen Jacobs
International Motor Co., Long Island City, White Plains, Rochester and Albany, N. Y., and Camden, N. J., Faile & Seelye

W. F. OVERLY & SONS

Architectural Sheet Metal Work

GREENSBURG, PA.

OFFICES

BUFFALO, N. Y. PITTSBURGH, PA. ERIE, PA. GREENSBURG, PA.

Products

GOODWIN AUTOMATIC STAGE VENTILATORS and PUTTYLESS SKYLIGHTS.

Also manufacturers of Special Architectural Sheet Metal Products, including Cornices, Roof Ventilators, Gutters and Conductors.

For Metal Covered Doors and Marquees, see Manufacturers' Index.

Goodwin Automatic Stage Ventilator

Constructed of heavy galvanized sheets reinforced by structural steel members of sufficient cross section to support many times the wind and snow loads that may be expected. This construction is so substantial that even in case of fire the Goodwin Automatic Stage Ventilator will not be damaged greatly unless the supporting members of the roof structure are destroyed.

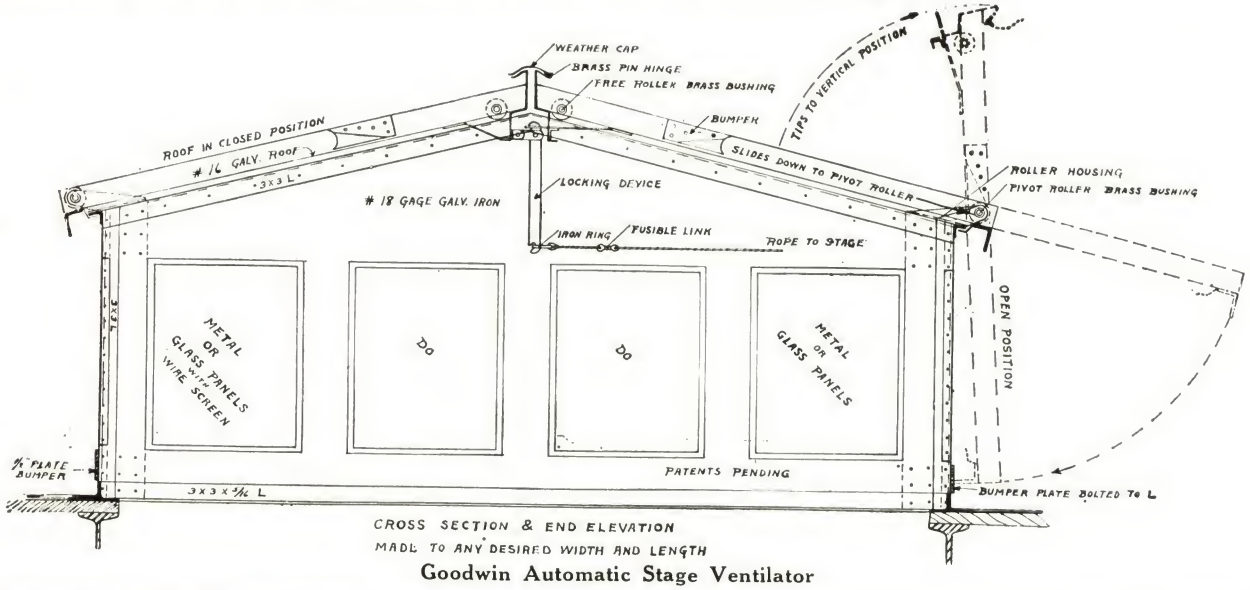
Primarily designed for fire protection purposes, the Goodwin Automatic Stage Ventilator may also be used for natural gravity ventilation by installing a ventilator along the ridge or by placing sash in the base. If light is desired the sash in the base may be glazed.

Operation—Should a fire occur on the stage of any theater which is provided with a Goodwin Automatic Stage Ventilator the first slight increase in temperature causes a fusible link to separate and allows the heavy sections to roll down on both sides. The sections assume a vertical position, providing a clean space the full area of the ventilator for the free discharge of smoke and flame. The proscenium arch being fully protected by the asbestos curtain, the entire stage and equipment may be completely destroyed without any material damage to the auditorium.

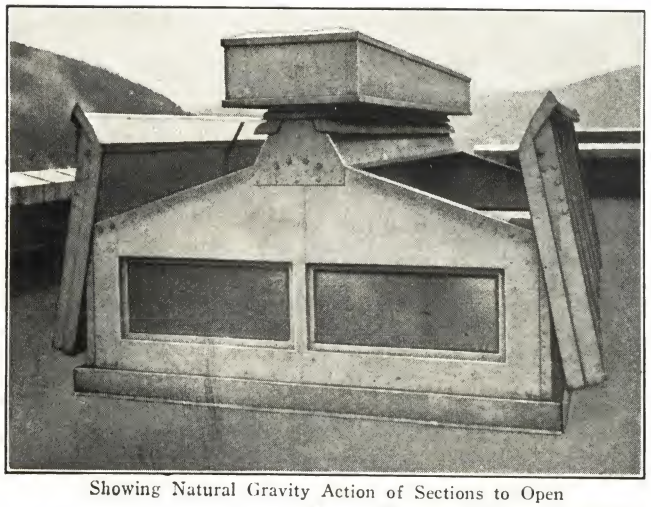
Sizes—The Goodwin Automatic Stage Ventilator is built to any desired width and length.

Engineering Service

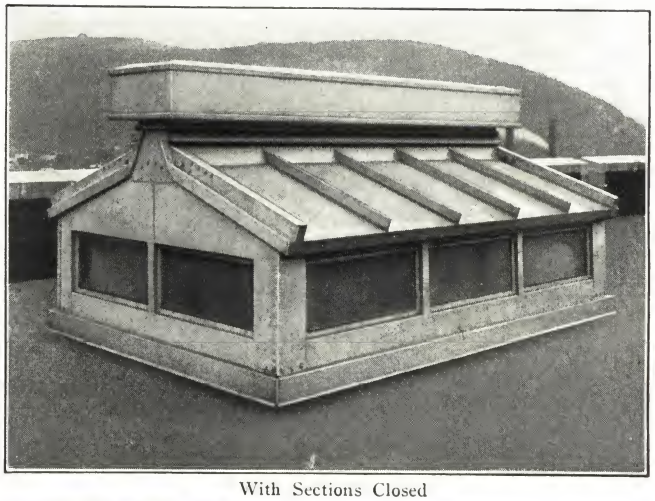
We will be glad to co-operate with architects, engineers, contractors or owners and offer our Engineering Service without obligation.



Goodwin Automatic Stage Ventilator

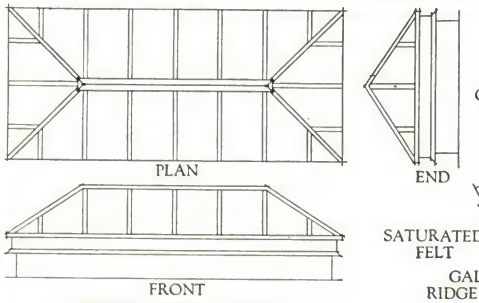


Showing Natural Gravity Action of Sections to Open

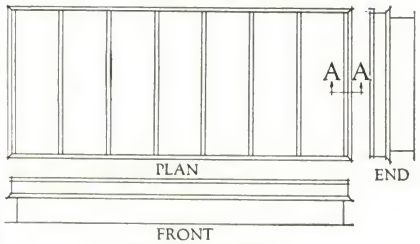


With Sections Closed

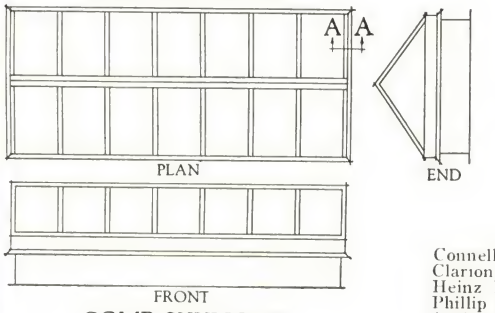
Exterior Views Goodwin Automatic Stage Ventilator



HIPPED SKYLIGHT



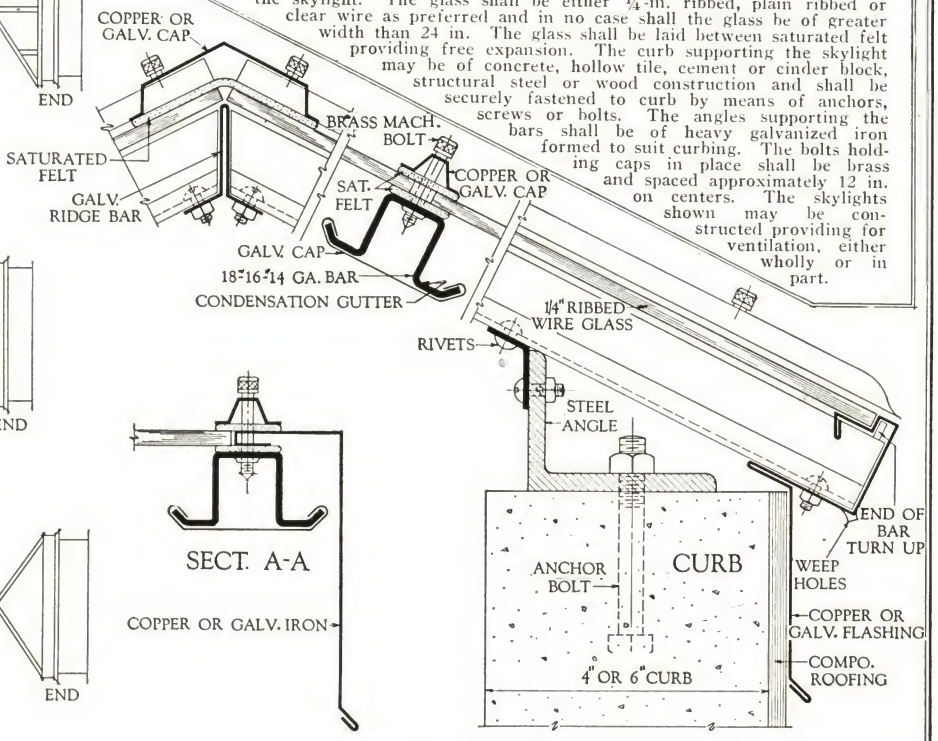
FLAT SKYLIGHT



COMB SKYLIGHT

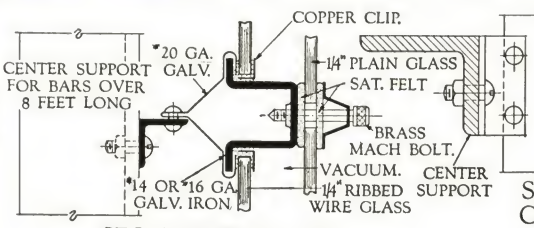
Specifications of the Goodwin Puttyless Skylight

Glass supporting bars shall be of size shown to insure against a greater deflection than 1/8 in. per lineal foot with a live load of 60 lb. per square foot on the skylight. The glass shall be either 1/4-in. ribbed, plain ribbed or clear wire as preferred and in no case shall the glass be of greater width than 24 in. The glass shall be laid between saturated felt providing free expansion. The curb supporting the skylight may be of concrete, hollow tile, cement or cinder block, structural steel or wood construction and shall be securely fastened to curb by means of anchors, screws or bolts. The angles supporting the bars shall be of heavy galvanized iron formed to suit curbing. The bolts holding caps in place shall be brass and spaced approximately 12 in. on centers. The skylights shown may be constructed providing for ventilation, either wholly or in part.

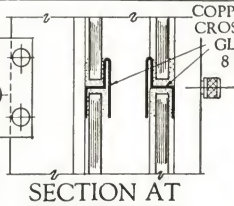


Installations

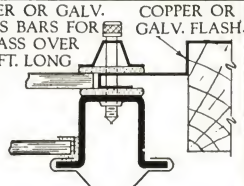
Connelly Trade School, Pittsburgh, Pa.
Clarion Nat'l Bank, Clarion, Pa.
Heinz Plant, Medina, N. Y.
Phillip Jones Corp., Barnesboro, Pa.
Avalon Bank, Avalon, Pa.
State Office Bldg., Buffalo, N. Y.
E. H. Caste Bldg., Vandergrift, Pa.
G. C. Murphy Co., Verona, Pa.
New City Hall, North Tonawanda, N. Y.
Iron City Dry Cleaning Co., Pittsburgh, Pa.
Schenley High, Pittsburgh, Pa.



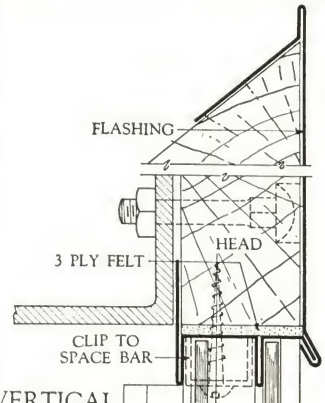
SECTION THRU BAR



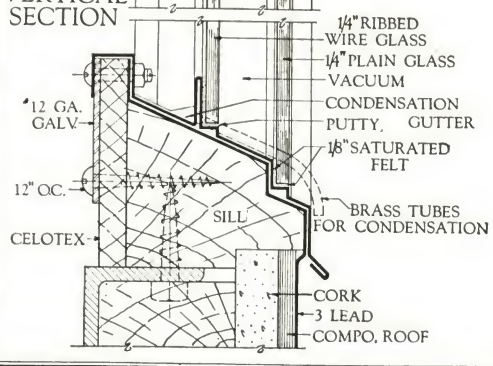
SECTION AT CROSS BARS



SECTION SHOWING FLASHING AT END OF RUN

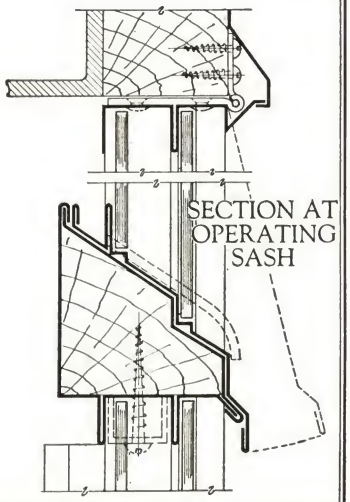


VERTICAL SECTION



Some Recent Installations

American Enka Corporation, Asheville, N. C.
87,000 sq. ft. sawtooth skylights
Susquehanna Silk Mills, Jersey Shore, Pa.
40,000 sq. ft. sawtooth skylights
Susquehanna Silk Mills, Sunbury, Pa.
2500 sq. ft. sawtooth skylights
Greensburg High School, Greensburg, Pa.



SECTION AT OPERATING SASH

W. F. OVERLY & SONS.
GREENSBURG, PA.

SKYLIGHT DETAILS.

PLATE NO. 1.
SCALE 1 1/2" = 1'-0"

DAVID LUPTON'S SONS COMPANY

Corrugated Wire Glass
Allegheny Avenue and Tulip Street
PHILADELPHIA, PA.

SALES REPRESENTATIVES IN PRINCIPAL CITIES
Member Solid Section Steel Window Industry

Lupton Products, in addition to Corrugated Wire Glass, include Steel Casements, Office and Industrial Windows, Window Operating Devices, Doors, Partitions, Steel Shelving and Sheet Metal Products.

Corrugated Wire Glass is described below. Details and specifications of the other products will be found in that section of Sweet's catalogue containing information on Metal Windows and Doors. See Manufacturers' Index.

Lupton service is maintained to assist in solving problems in daylighting and natural ventilation. We will welcome the opportunity to work with you in submitting tentative designs showing application of Corrugated Wire Glass or any of our products.

The following pages present information intended to assist in the preparation of details and specifications. Details are typical to show general construction and the principles underlying satisfactory installation. They cover the more usual types of wall and roof construction. A folder containing these and additional details is available on request.

CORRUGATED WIRE GLASS

MANUFACTURED BY PENNSYLVANIA WIRE GLASS CO.

Corrugated Wire Glass is a translucent material which, if used as a covering for skylights, roofs and sidewalls, has definite advantages.

It transmits a finely diffused light with minimum glare and shadow.

It is easily erected and completely weatherproof.

Because of its corrugations it develops greater strength under uniform loading and greater resistance to vibration and temperature changes than any other type of sheet glass of equal thickness.

No skylight bars are used. The glass carries the load directly to purlins and curbs.

Maintenance cost is low because there are no bars to rust or corrode, breakage is practically eliminated and the corrugations permit rain to clean the glass.

It meets every requirement of the National Board of Fire Underwriters for fire retardment.

Corrugated Wire Glass is often used as a covering for the entire roof area of a building. It is readily applied to single or double pitch roofs, connected directly to any type roof covering. It can be used for sawtooth roofs, back slopes of Lupton V-type roof, sidewalls, marquises and canopies.

Installation Details

Details covering the more common types of installation appear on following pages. A folder containing additional roof details, details for Canopy and Marquise, Sidewall Construction and application of Roof Ventilators will be sent on request.

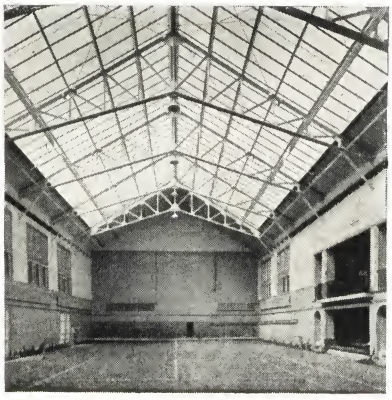
Note: Details are typical and are meant to indicate method of attaching glass to roof or framework. Sizes of curbs shown are minimum for satisfactory glass bearing. Supporting structure must be designed with adequate strength in each specific case.

Draining Condensation

Two methods of draining condensation are shown on page 3. The usual condensation gutters can be used; or drainage tubes can be provided, placed at the bottom of each corrugation under the felt separating the two sheets of glass and under the special sealing strip at the lower curb. Tubes conduct condensation to outside of roof.

Actinic Glass

Actinic glass excludes much of the sun's radiant heat, thus reducing the summer temperature under the glass. Its use is sometimes advisable where glass is to cover large areas.



Left:
Approximately 7000 square feet of Corrugated Wire Glass used in this indoor tennis court for Ralph Pulitzer, Manhasset, L. I. James W. O'Connor, Architect

Right:
Installation of Corrugated Wire Glass over sludge beds at Burlington, N. J.
B. A. Sleeper, W. H. Boardman & S. R. Probasco, Engineers
Approximately 11,103 square feet of Corrugated Wire Glass were used

SPECIFICATIONS

Installation of Corrugated Wire Glass

Work by Others

(1) All supporting frames, curbs, purlins. ridge beams, tie-rods, bracing for proper construction, all roofing, curb and roof flashings, gutters and counter-flashings shall be provided under other contracts.

Work Required

(2) This contract includes the furnishing of all labor, materials, equipment and services necessary for, and reasonably incidental to, the erection of (White or Actinic—specify which) Corrugated Wire Glass (in Skylights or Side-Wall Panels), as manufactured by the Pennsylvania Wire Glass Company with standard fittings of (specify one of the following: 18 oz. cold rolled copper, 24 gauge copper bearing galvanized steel (painted with aluminum), 13 gauge zinc, No. 3S8 aluminum (.032 in. thick), 24 gauge "Leadclad" steel or 6 lb. Hoyt Hard Lead) as shown on the drawings and herein specified.

Shop Drawings

(3) This Contractor shall furnish the (Architects, Engineers, Purchasers) for their approval before any of the work is executed, complete shop drawings conforming to the recommendation of the Manufacturer.

Construction and Erection

(4) This Contractor shall erect the Corrugated Wire Glass exactly as prescribed in the approved drawings and recommendations of the Pennsylvania Wire Glass Company.

Notes. (The following paragraphs may be included where deemed necessary.)

(5) No sheet of Corrugated Wire Glass shall exceed 27¾ in. in width, and no single sheet shall span more than 60 in. clear opening (up the slope) without an intermediate support. Where glass is set at an angle of 60 degrees, or more, from the horizontal, the maximum clear span may extend to 96 in. (up the slope). Corrugated Wire Glass covering openings greater than those mentioned must have an intermediate support or arrangements must be made to use two or more lights of glass.

(6) The sheets of glass shall be laid edge to edge (not lapping) with ½ in. spaces between the sheets and the open joints so formed shall be covered with exterior metal cover caps and metal inner strips which conform to the corrugations of the glass. The exterior cover caps shall have an asphaltic lining. The caps and inner strips, to complete the joint, shall be bolted together by bolts passing through the caps and inner strips and between the sheets of glass approximately 9 in. center to center.

(7) Where structural steel supports occur, clips, engaged by bolts passing through the cover caps, shall be used to hold the glass securely in place. Wherever wood supports occur lag screws shall be used in place of clips.

(8) Each light of glass shall have a firm, even bearing and wherever any sheet of glass is applied to structural work (such as curbs, purlins, etc.), or where it laps over other glass, it shall be cushioned with impregnated felt or asphalt strip. At the bottom (or eaves) of Corrugated Wire Glass construction and at the top (in conjunction with the ridge or flashings) the openings caused by the corrugations of the glass shall be filled with a sealing strip especially designed and supplied for this purpose.

C.W.G. SKYLIGHTS IN STANDARD SIZES

Where C.W.G. Skylights are required it is possible in many cases to speed delivery by using standard skylights. Standard size skylights require the least amount of time for delivery and erection. Shipment can be made from Dunbar, Pa., within a few days after we receive the order, with complete information.

Flashing for upper curb, end caps, bolts, clips, sealing strips and elastic cement are included with the glass. Setting instructions are included in each crate (Lupton will quote price on erection if requested).

The flashings, etc., can be of any of the materials listed in the specifications above. Standard skylight is designed to be applied to wood curbs as shown in details on next page. Sizes are given in the table below.

In ordering standard skylights give quantity, catalogue number, kind of fittings, kind of glass (white or actinic) and pitch (standard pitch 6 inches in 12 inches will be assumed if no other is specified).

A list of prices covering all standard sizes with white corrugated glass and Copper, Galvanized Steel or Aluminum fittings may be had on request.

Ventilation may be provided if required, by means of windows, ventilators or fans.

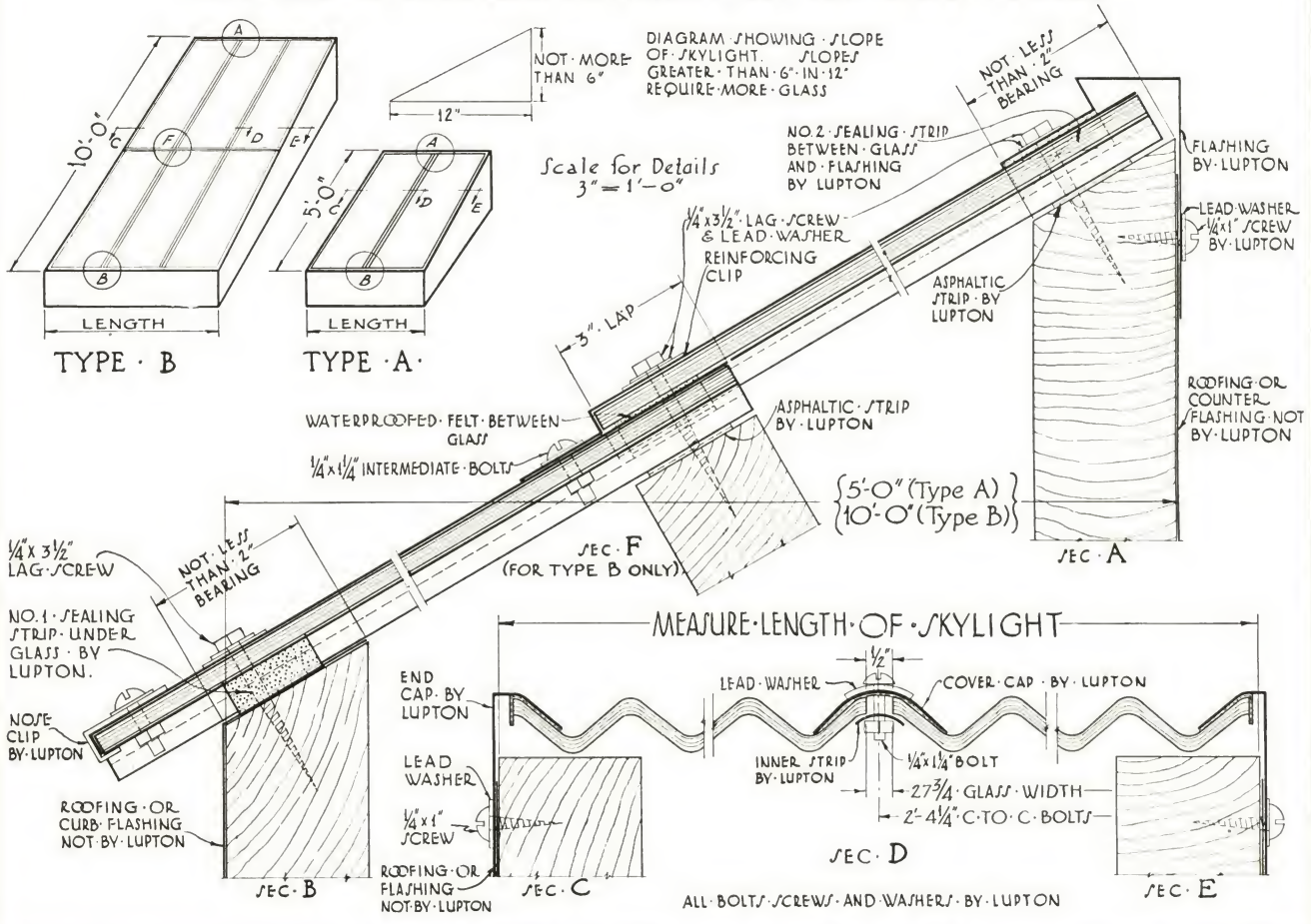
STANDARD SIZES

*Length	Number of lights	Type "A"—One light high *5′ 0″			Type "B"—Two lights high *10′ 0″		
		Catalog number	Area, sq. ft.	Ship. wt., lbs.	Catalog number	Area, sq. ft.	Ship. wt., lbs.
2′ 4¼″	1	A-1	13.5	95	B-1	27	190
4′ 8½″	2	A-2	27.0	189	B-2	54	378
7′ 0¾″	3	A-3	40.5	284	B-3	81	568
9′ 5″	4	A-4	54.0	378	B-4	108	756
11′ 9¼″	5	A-5	67.5	473	B-5	135	946
14′ 1½″	6	A-6	81.0	568	B-6	162	1136
16′ 5¾″	7	A-7	94.5	662	B-7	189	1324
18′ 10″	8	A-8	108.0	756	B-8	216	1512
21′ 2¼″	9	A-9	121.5	851	B-9	243	1702
23′ 6½″	10	A-10	135.0	945	B-10	270	1890

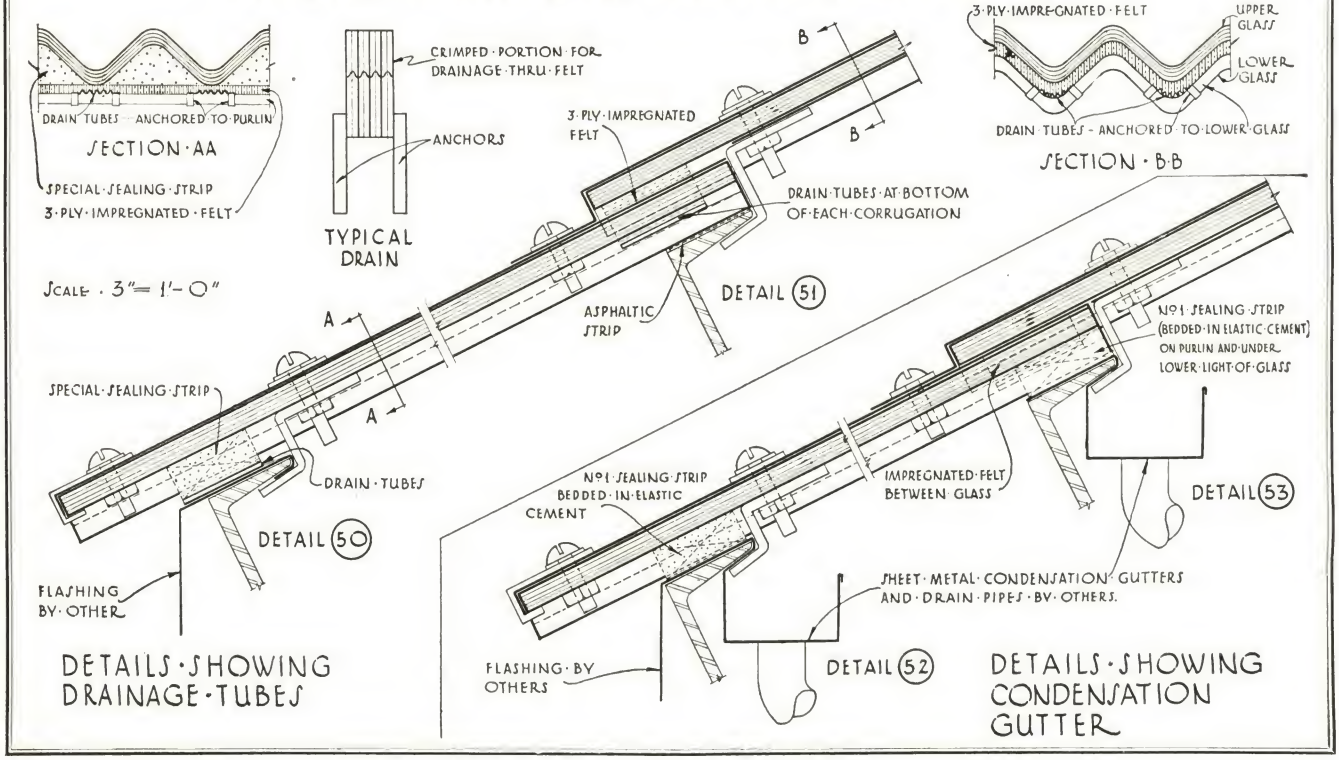
*Dimensions are out-to-out of curb. See detail on next page.

CORRUGATED WIRE GLASS

DETAILS—STANDARD SKYLIGHT SET ON WOOD CURBS



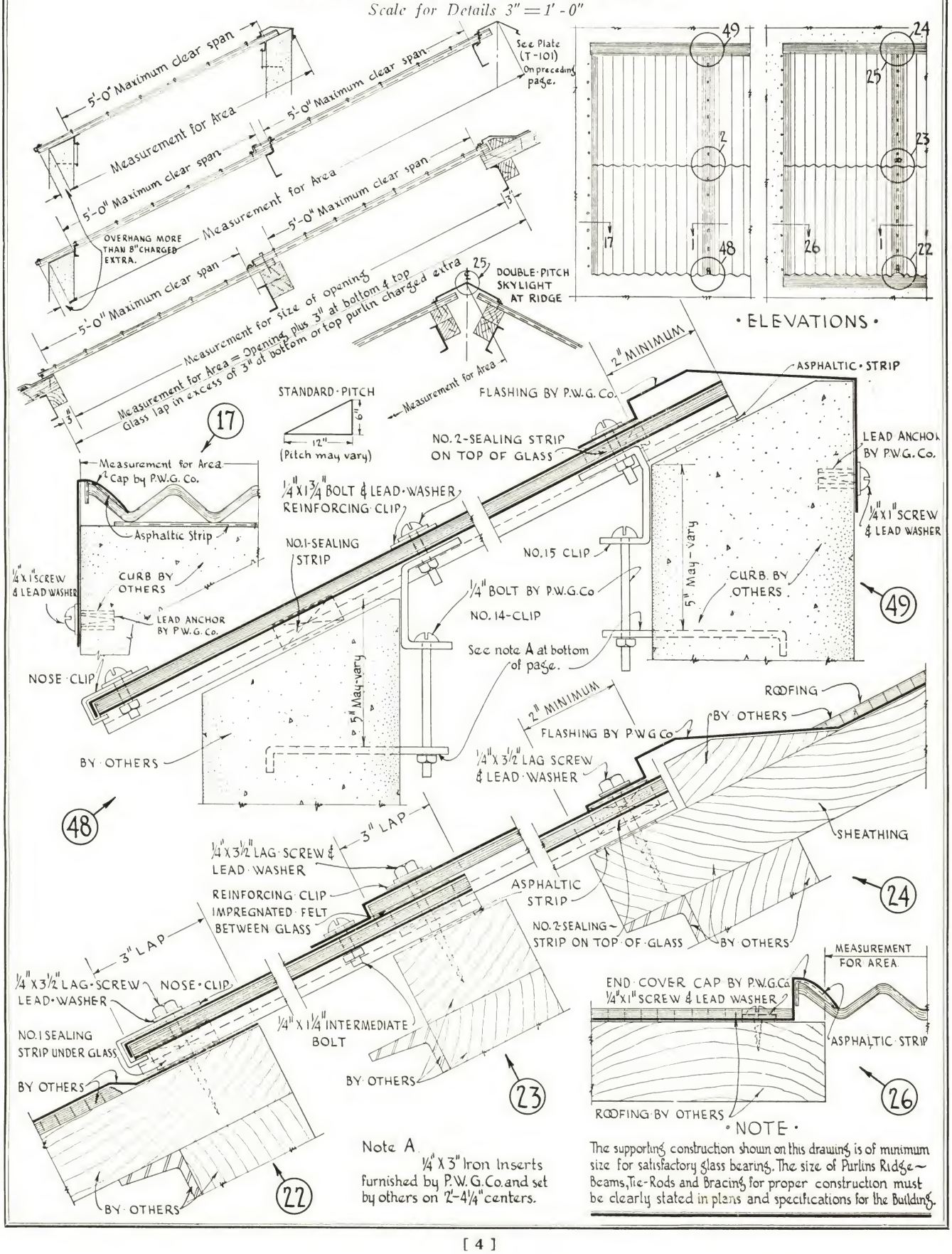
DETAILS—METHODS OF DRAINING CONDENSATION



CORRUGATED WIRE GLASS

DETAILS—C.W.G. APPLIED TO CONCRETE CURBS AND TO WOOD SHEATHED ROOFS

Scale for Details 3" = 1' - 0"



Note A

¼" x 3" Iron Inserts furnished by P.W.G. Co. and set by others on 2'-4¼" centers.

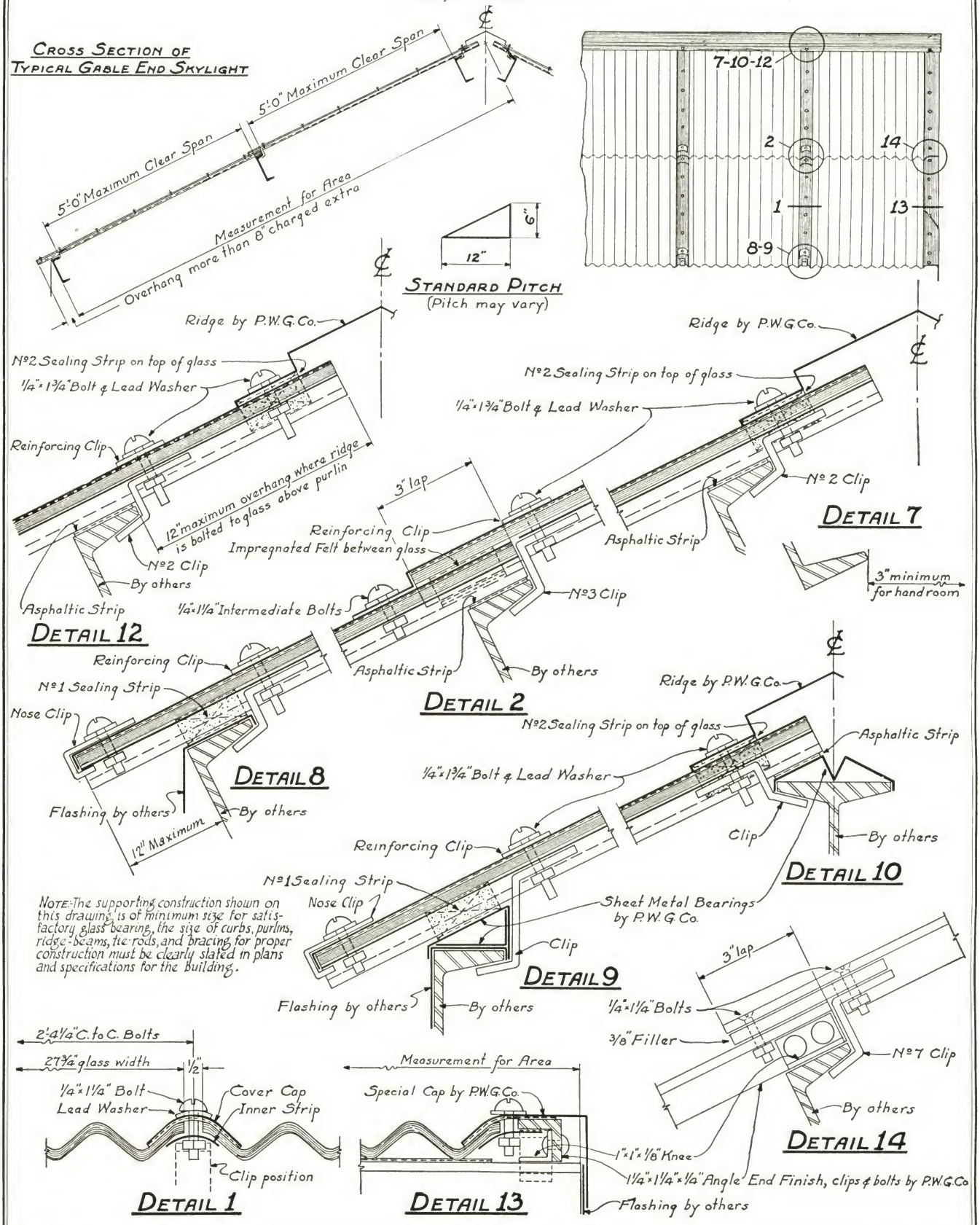
• NOTE •

The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of Purlins Ridge-Beams, Tie-Rods and Bracing for proper construction must be clearly stated in plans and specifications for the Building.

CORRUGATED WIRE GLASS

DETAILS—C.W.G. APPLIED TO STEEL FRAME ROOF

Scale for Details 3" = 1'-0"

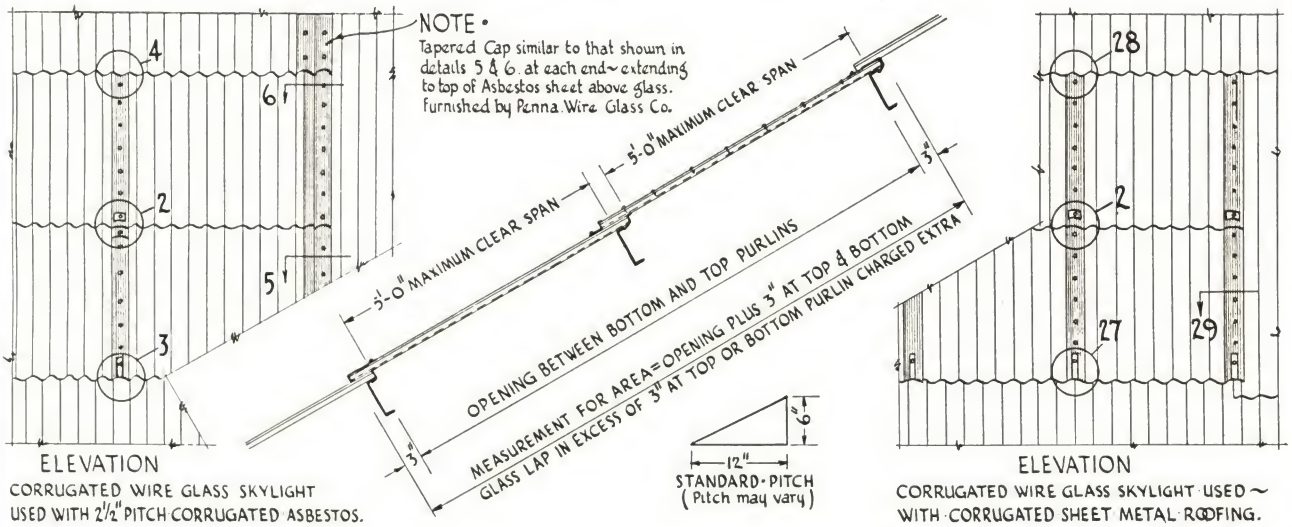


NOTE-PA. WIRE GLASS CO. DOES NOT FURNISH PURLINS, CURB OR RIDGE SUPPORTS, CURB OR COUNTER FLASHINGS, VENTILATORS OR FRAMES.

CORRUGATED WIRE GLASS

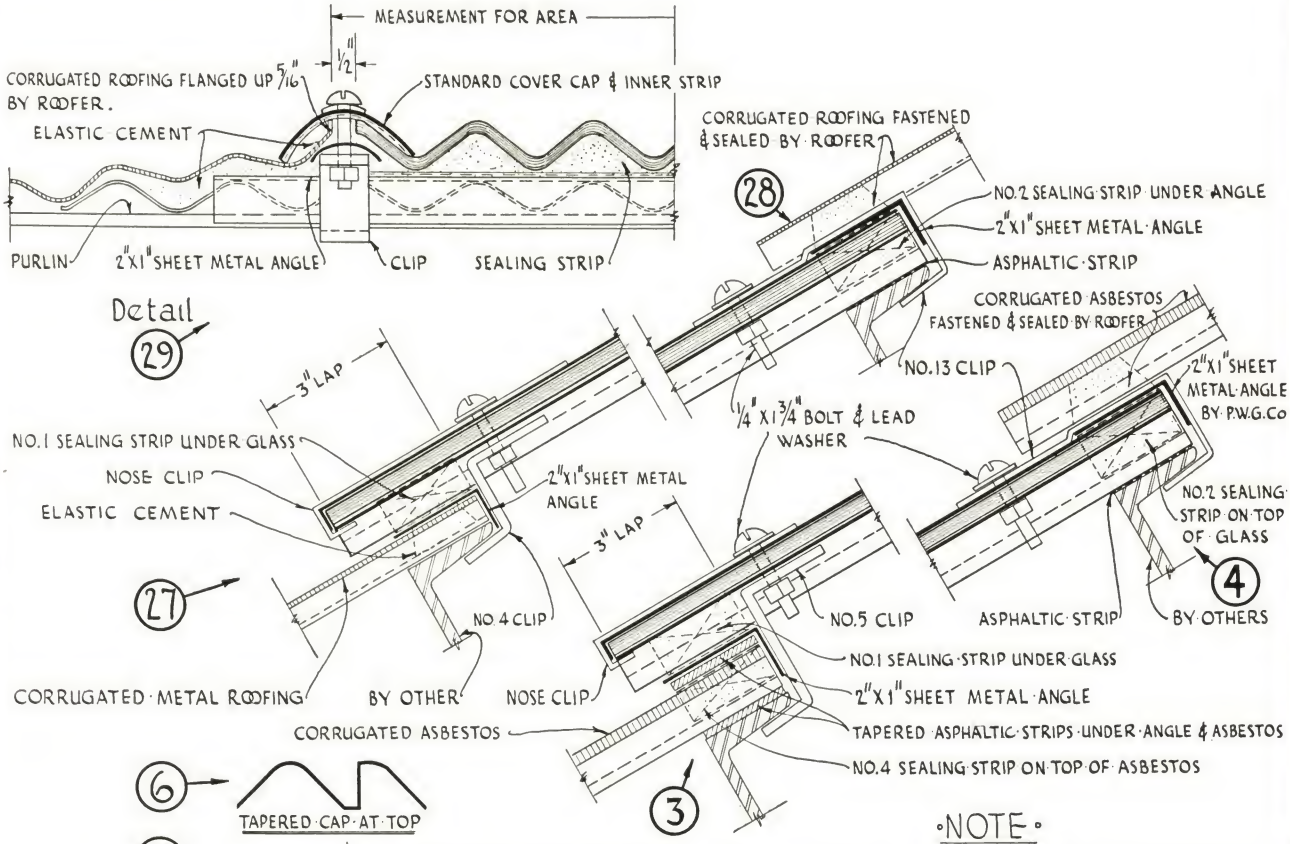
DETAILS—C.W.G. APPLIED TO CORRUGATED ROOFING

Scale for Details 3" = 1'-0"



ELEVATION
CORRUGATED WIRE GLASS SKYLIGHT USED WITH 2½" PITCH CORRUGATED ASBESTOS.

ELEVATION
CORRUGATED WIRE GLASS SKYLIGHT USED ~ WITH CORRUGATED SHEET METAL ROOFING.



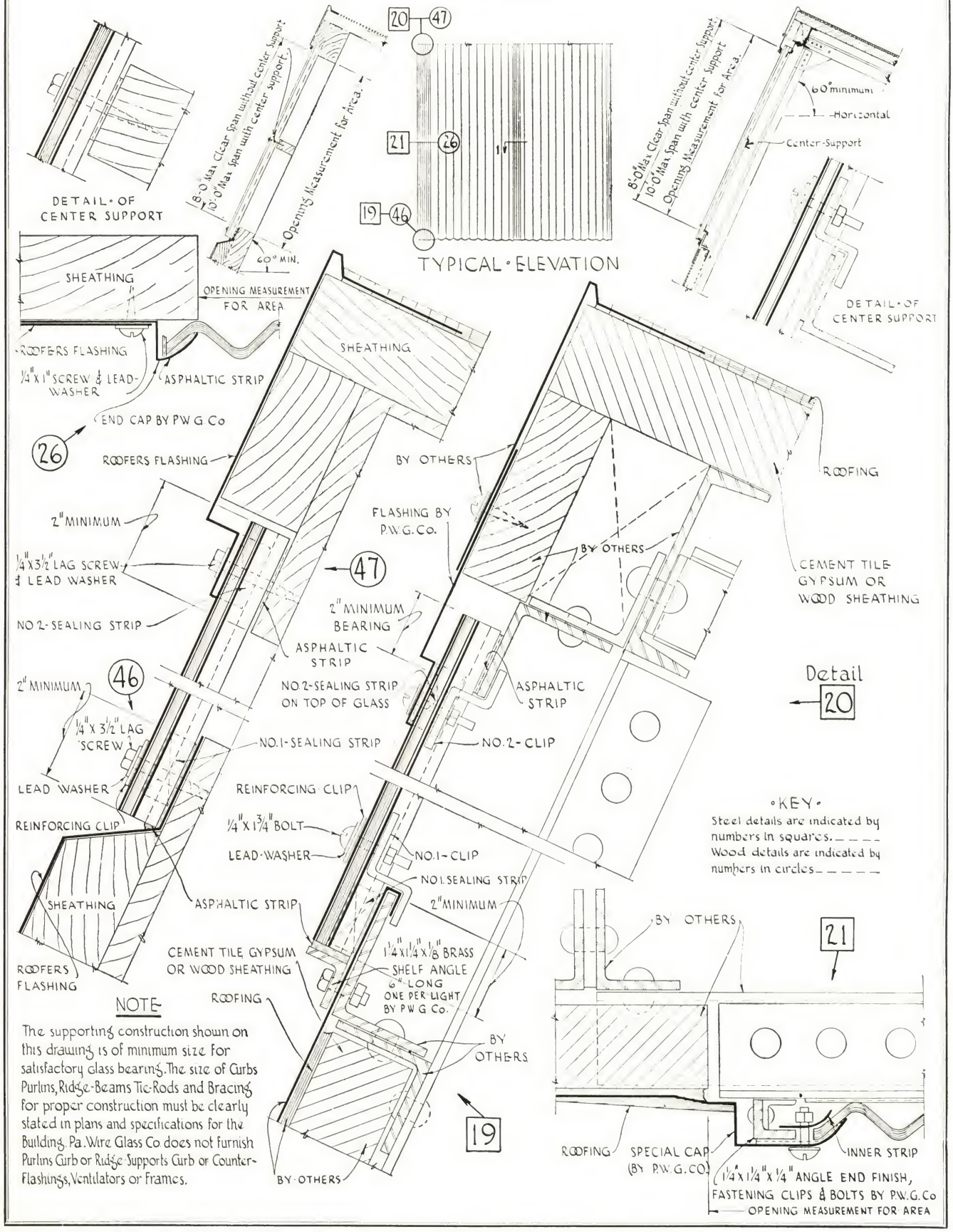
•NOTE•

The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of Curbs, Purlins, Ridge-Beams, Tie-Rods and Bracing for proper construction must be clearly stated in plans and specifications for the building.——Pennsylvania Wire Glass Co. does not furnish Purlins, Curb or Ridge-Supports Curb or Counter Flashing, Ventilators or Frames.

CORRUGATED WIRE GLASS

DETAILS—C.W.G. APPLIED TO SAWTOOTH FRAMING

Scale for Details 3" = 1'-0"



NOTE

The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of Curbs Purlins, Ridge-Beams Tie-Rods and Bracing for proper construction must be clearly stated in plans and specifications for the Building. Pa. Wire Glass Co does not furnish Purlins Curb or Ridge Supports Curb or Counter-Flashings, Ventilators or Frames.

PENNSYLVANIA WIRE GLASS COMPANY

FRANK L. MARTIN, President

EXECUTIVE OFFICE
Pennsylvania Building
PHILADELPHIA, PA.

WORKS, DUNBAR, PA.

HIRES TURNER GLASS COMPANY, DISTRIBUTERS

ALBANY, N. Y. BALTIMORE, MD. ROCHESTER, N. Y. PHILADELPHIA, PA. WASHINGTON, D. C.

PACIFIC SLOPE DISTRIBUTERS, H. B. Mills Co., SAN FRANCISCO, CALIF.

Products

SKYLIGHTS and GLAZED ROOFING; MARQUISES; GLAZED CANOPIES; SIDEWALLS, etc.

SOLID WIRE GLASS—Rough, Ribbed, Corrugated (CWG), Figured, and ACTINIC GLASS.

Also Glass without wire netting, in various patterns and thicknesses, to suit every requirement.

TRADE-MARK

Wire Glass

Process—Solid wire glass, made by the Pennsylvania continuous process, is completely formed by one pouring and one rolling; the only process that makes possible the manufacture of wire glass as thin as ⅛ in.

Fire Protection—Wire glass is a valuable fire retardant—it prevents flames from attacking adjacent buildings.

Approval (Distinguishing Mark)—All of our wire glass, ¼ in. and over in thickness, has the full approval of the National Board of Fire Underwriters as a fire retardant, which requires a distinguishing mark to identify the glass. Our distinguishing mark is our *cabled strand,* appearing every 10 in. across the sheet and the full length of each sheet.

Service—We offer gratuitous engineering advice on all glass problems.

Samples—Samples, catalogues and circulars on request.

Specifications—Architects should always specify "Solid Wire Glass manufactured by the PENNSYLVANIA WIRE GLASS COMPANY" (mention the kind desired).

Corrugated Wire Glass

CWG is a corrugated sheet of glass with wire netting incorporated.

Corrugated Wire Glass Skylight—Corrugated Wire Glass is made to meet the demand for a substantial skylight, admitting properly diffused light. CWG can be placed on a roof of any material. including corrugated iron and corrugated asbestos.

Uses—CWG can be used also on roofs, sidewalls, marquises, canopies and wherever *daylight* is desired.

Weight—CWG weighs about 5½ lbs. to the sq. ft.

Strength—CWG has strength many times greater than any flat glass of equal thickness, owing to the corrugations.

Kind—CWG is made in deep angle, 2 ½ in. center to center of corrugations.

Standard Size—27 ¾ in. wide by 42 or 63-in. long, or any length up to 126 in., conditions governing.

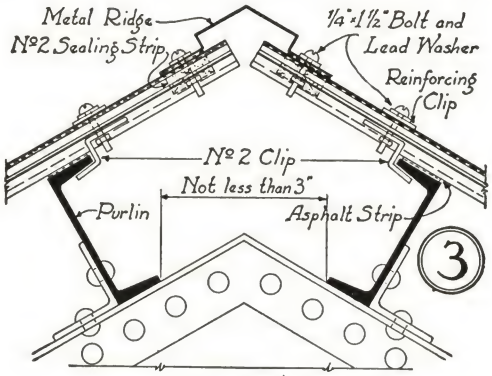
Specifications for Installation of CWG

The skylights, roof or sidewall construction, where marked "Corrugated Wire Glass" on the plans and elevations, shall be formed of Corrugated Wire Glass (if Actinic Corrugated Wire Glass is wanted, say "Actinic Corrugated Wire Glass"), with standard fittings of 18-oz. copper and brass (can be furnished, if desired, in galvanized iron, zinc, aluminum or lead), in accordance with details and instructions submitted.

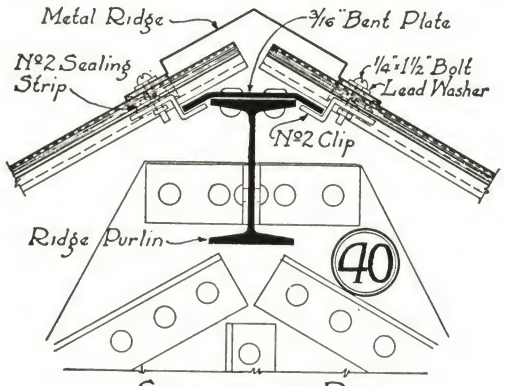
Instruction and Details for Erecting

To assist the architect in detailing and supervising the erection of Corrugated Wire Glass Skylights, we have prepared complete instructions and detail drawings. Some of the drawings from this book are presented on the following page and the publication, Bulletin D3, will be sent upon request.

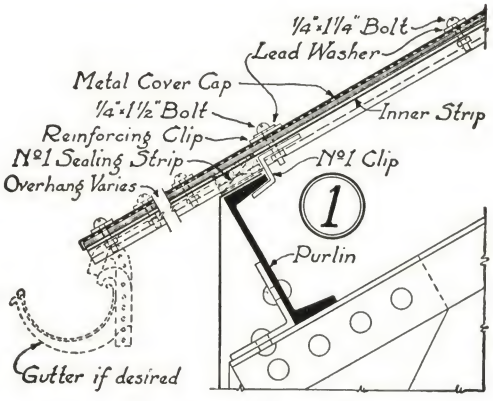
Thousands of Feet of Corrugated Wire Glass in Sawtooth Skylights at Libbey-Owens-Ford Glass Co., Toledo, Ohio



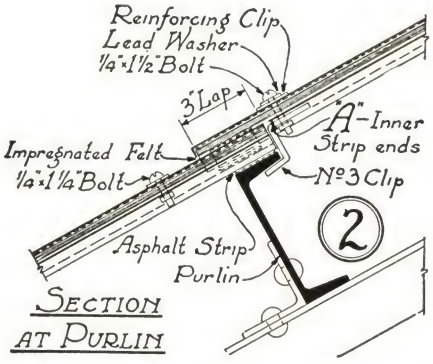
SECTION AT RIDGE



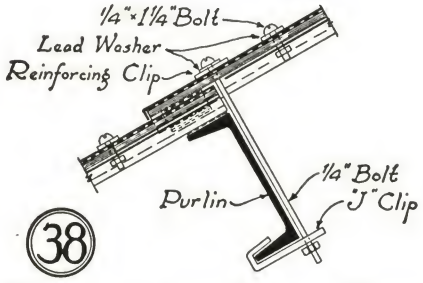
SECTION AT RIDGE



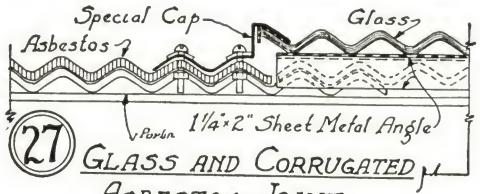
SECTION AT EAVE



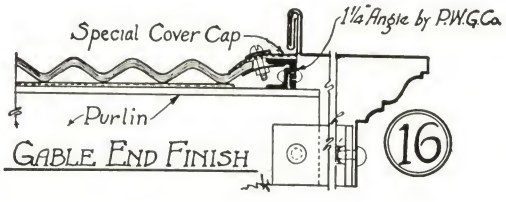
SECTION AT PURLIN



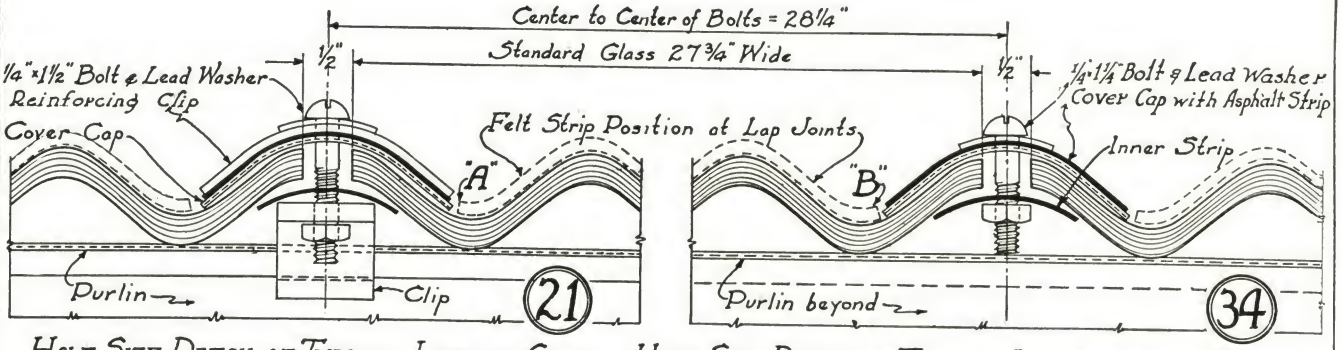
FASTENING WHEN PURLIN FLANGES POINT DOWN THE ROOF



GLASS AND CORRUGATED ASBESTOS JOINT



GABLE END FINISH



HALF SIZE DETAIL OF TYPICAL JOINT AT CLIP

HALF SIZE DETAIL OF TYPICAL JOINT BETWEEN PURLINS

PENNSYLVANIA WIRE GLASS CO.	TYPICAL INSTALLATION DETAILS CORRUGATED WIRE GLASS SKYLIGHT (SEND FOR COMPLETE DETAILED INFORMATION)	NOT DRAWN TO SCALE

Actinic Glass—An Aid to Industry

Why Actinic Glass Is Needed

No one in these times would build a dark and gloomy factory with a few small windows. Yet in modern daylight construction, with its large glass areas, the problems of glare in various forms and of excessive heat from direct sunlight cannot be evaded.

Actinic Glass solves these problems so successfully that literally acres of it have been installed in new industrial buildings.

How It Differs from Ordinary Glass

Without going into technical details, the reasons why Actinic Glass reduces glare and also the heat of sunlight, lie in its special chemical composition. As to appearance, it looks like ordinary rolled glass, except it has a tint technically described as an "unsaturated yellow."

Facilitates Production by Reducing Eyestrain

Glare in various forms is such a hindrance to workers that it obviously increases manufacturing costs and impairs quality of output. As an illustration, when the sun is shining through an ordinary window or skylight, such objects as white paper or light colored textiles are often so glaringly illuminated that it may be actually painful and injurious to the eyes. When, on the other hand, Actinic is used under such conditions a person can even read print upon white paper with comfort. The relief is so pronounced that it can scarcely be appreciated without seeing an actual comparison.

Small samples for this purpose will be sent free upon request.

Improves Morale by Moderating the Sun's Heat

Daylight factories glazed with ordinary glass often suggest a florist's hothouse. The best proof of relief from heat gained by Actinic is its extensive recent use in mills of the south where it is specified by leading architects.

As indicated by thermometers, the discomfort due to direct sunlight is reduced about 55% by ¼-in. and about 40% by ⅛-in. Actinic.

Saves Costs of Curtains, Painting, etc.

Mills with large areas of Actinic have found it unnecessary to use shades or awnings, or to paint their windows, although if colorless glass had been used, glare and heat would admittedly have been intolerable.

Other Advantages

More cheerful illumination.

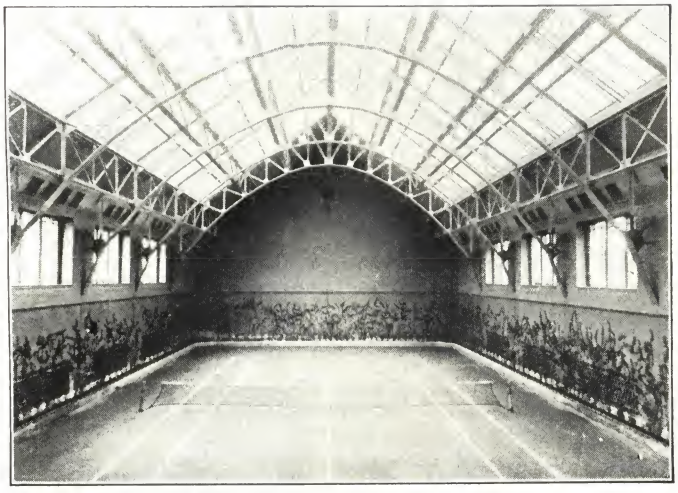
Improved ability to see, and retardation of undesirable chemical changes, such as fading of colors, add to the general satisfaction given by this novel product.

Technical details will be cheerfully furnished upon request.

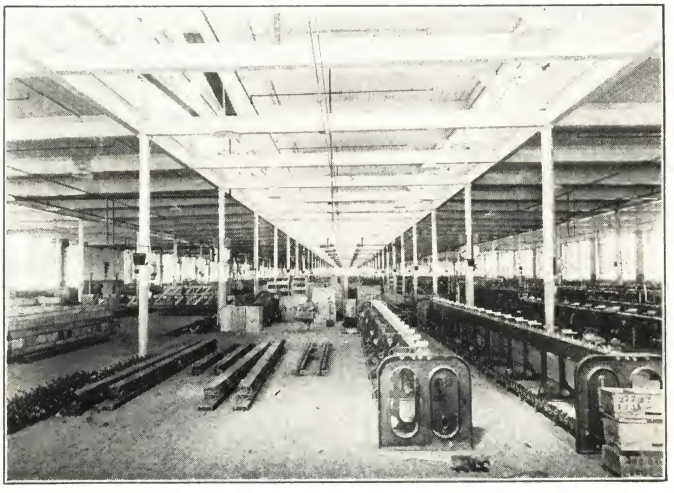
Designs and Thicknesses

Actinic Glass is made in the following designs and thicknesses:

⅛-in. plain rough or ribbed
¼-in. rough or ribbed wire
Corrugated Wire Glass



Actinic Corrugated Wire Glass in Indoor Tennis Court of George D. Widener, Philadelphia, Pa.



Thousands of Feet of Actinic Glass Used at Bemis Bag Mills, Talladega, Ala.
Note sidewall lighting through Actinic Glass

GLENDON A. RICHARDS CO.

Manufacturers of Puttyless Skylights and Revolving Ventilators

Winter Avenue and Blumerich Street, Northwest
GRAND RAPIDS, MICH.

Products

The SIMPLICITY PUTTYLESS SKYLIGHT; the SIMPLICITY SKYLIGHT VENTILATOR; the VENTWELL REVOLVING VENTILATOR.

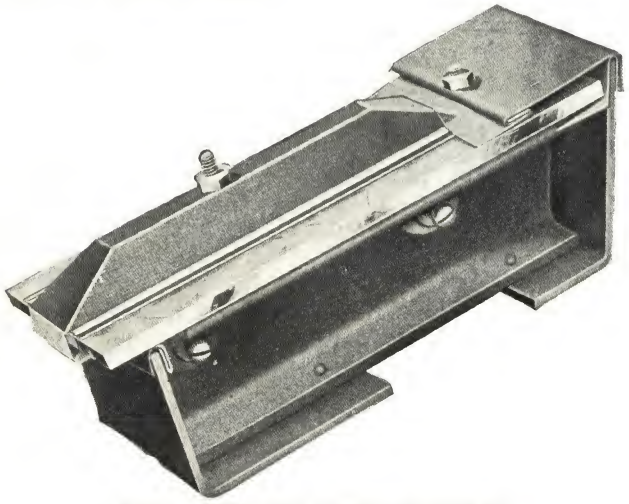
Simplicity Puttyless Skylight

Our aim in designing this skylight was to provide a product which would combine the maximum amount of daylight per square foot of area, with the lowest maintenance cost possible, and at the same time be of such construction as to lend itself to erection in the field with a minimum amount of time and labor.

The Simplicity Puttyless Skylight consists of a steel supporting frame of tee iron rafters with angle curb and ridge members. The rafters are provided with sheet metal condensation gutters over which the glass (set in came lead glazing strips or channels) is laid. The mounting caps are set in place over the glass and secured, compressing the glazing channel firmly against both sides of the glass. The ridge cap and end flashing are then applied completing the assembly.

Steel Frame—The sizes of the steel members comprising the frame vary to suit conditions. Ridge and hip members are made in two sections (details on following page); this form of construction allows the frame for each slope, consisting of rafters, ridge and hip members, to be assembled complete at the factory. The erection work in the field is reduced to bolting the ridges and hips together and anchoring frame at curb.

Glazing Strips—These strips are small channels of came lead placed on the edges of the glass resting on the rafter members. When the mounting caps are set and secured they compress the lead firmly against both sides of the glass, making an absolutely windtight and weathertight joint. The soft lead takes up any unevenness in the surface of the glass and gives a continuous bearing surface; it also permits enough come and go in the glass to provide for contraction and expansion, thereby eliminating glass breakage from either of these sources.



Section of Simplicity Puttyless Skylight Bar

Materials—The sheet metal work consisting of the mounting cap, ridge cover, condensation gutter and flashing may be of lead coated metal, galvanized iron or copper.

Advantages—Absolutely weathertight construction; maximum amount of daylight; condensation conducted to the exterior; glass breakage reduced to a minimum by use of lead glazing strip; ease of erection; ease of glass replacement.

Specification—Furnish and erect where shown on plan, skylights of the puttyless type, of a design to allow for free expansion and contraction of the glass, or movements due to vibration.

Each light of glass shall be entirely independent of every other light and the glass shall be held laterally in a manner to prevent its coming in contact with any rigid part.

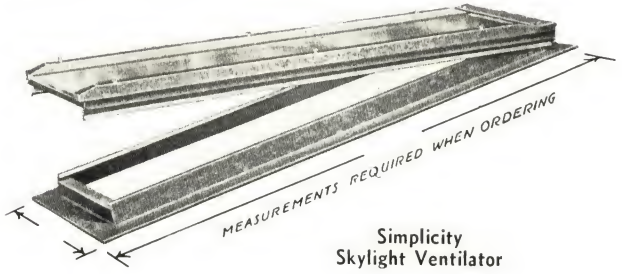
The bearing of the glass shall be flexible, so as to adjust itself to any warps or irregularities in the glass.

Simplicity Skylight Ventilator

These ventilators may be placed in any of our skylights by removing the glass and substituting the ventilating frame.

These ventilators are also made with flat flanges for use on shingle or composition roofs.

We manufacture an efficient and reliable operating device for these ventilators. Prices and description will be sent on request.



Simplicity
Skylight Ventilator

"Ventwell" Revolving Ventilator

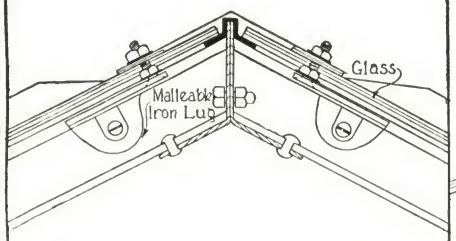
This ventilator revolves with the wind and is so constructed that the action of the outside air creates a vacuum in the ventilator itself thereby drawing up the air to be expelled. It is efficient, and guaranteed to give satisfaction under all weather conditions.

It may be had in either galvanized iron or copper.

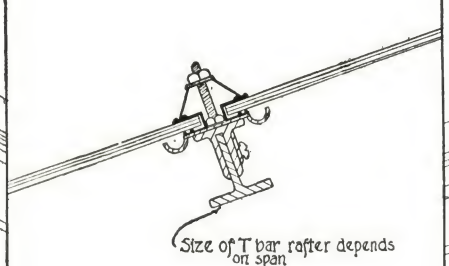
Bases and dampers extra.

Prices quoted on application.

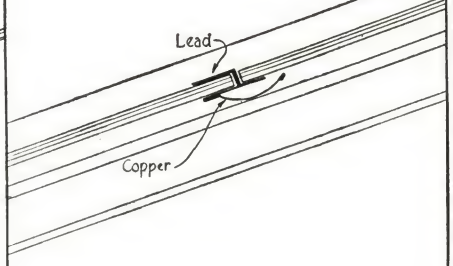
"Ventwell" Revolving
Ventilator



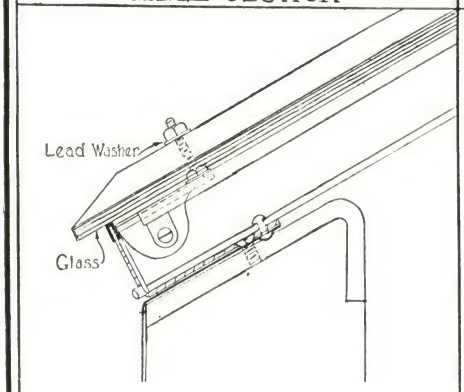
RIDGE SECTION



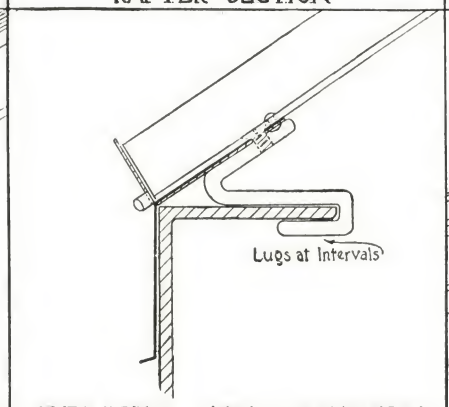
RAFTER SECTION



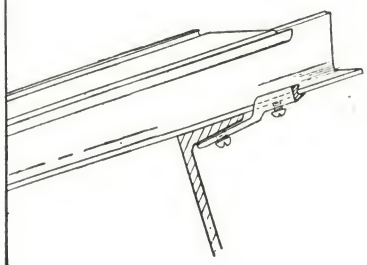
SECTION SHOWING JOINT WHERE MORE THAN ONE LENGTH OF GLASS IS USED



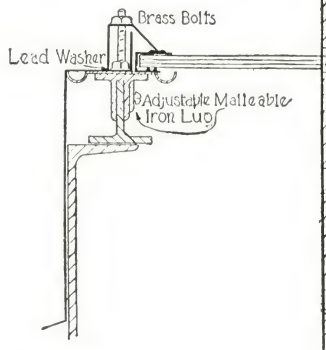
CURB DETAIL-CONCRETE OR WOOD CONSTRUCTION



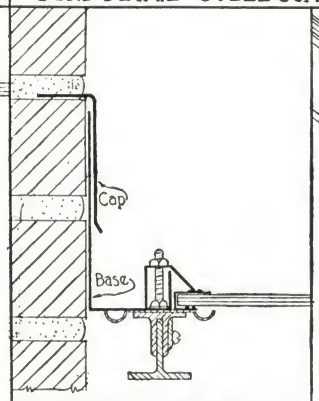
CURB DETAIL- STEEL CONSTRUCTION



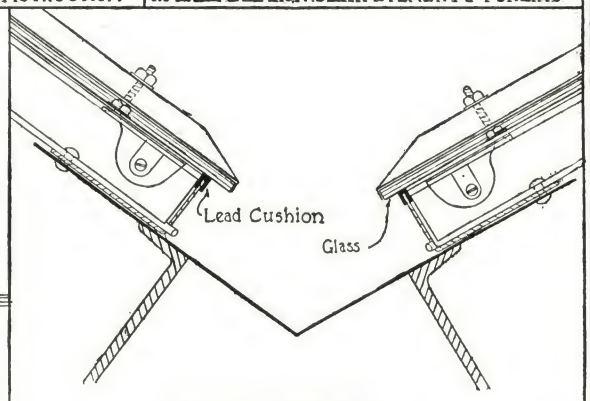
MALLEABLE IRON CLIP FASTENER AT PURLINS



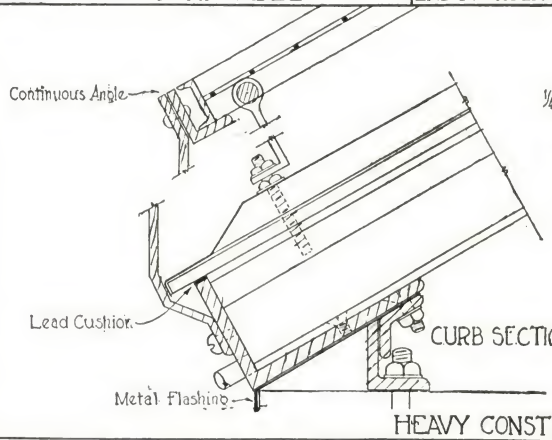
FLASHING AT GABLE



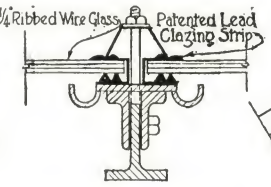
END FLASHING AT BRICK WALL



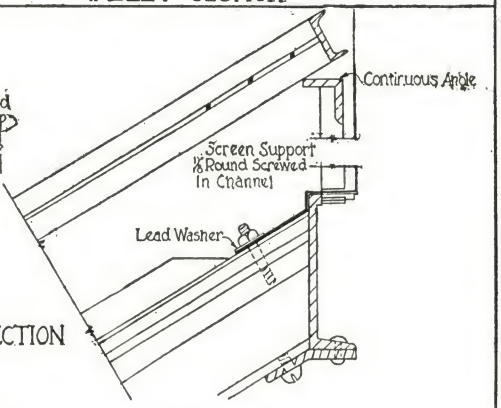
VALLEY SECTION



CURB SECTION



RAFTER SECTION



RIDGE SECTION

HEAVY CONSTRUCTION WITH GUARD

DRAWN BY SWEET'S CATALOGUE SERVICE INC.	STANDARD DETAILS OF SIMPLICITY PUTTYLESS SKYLIGHT CONSTRUCTION	SCALE 3" EQUALS 1-0" DATE: JULY 24 DRWG 1

H. H. ROBERTSON COMPANY

Robertson Glazing Construction, Skylights, Sidewall and Special Sash

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CAN.; ELLESMERE PORT, CHESHIRE, ENG.

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ENGLAND, ELLESMERE PORT, CHESHIRE: Mersey Iron Works

CANADA: H. H. ROBERTSON CO., LTD., TORONTO, ONT., AND MONTREAL, QUE.

Products

GLAZING CONSTRUCTION: Skylights, Sidewalls and Special Sash.

(Robertson Skylight and Sash construction are protected by United States Patent No. 1,243,020, October 16, 1917, and No. 1,666,764, April 17, 1928; also covered by other patents in the United States and other countries; other patents pending.)

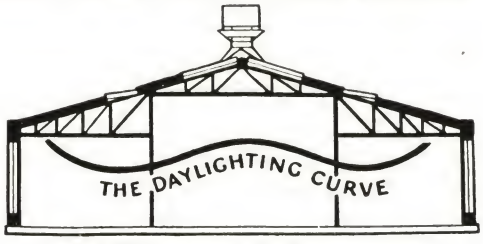
Also manufactures Robertson Process Asphalts, Pipe Coatings, Battery Sealing, Insulation, Saturation and Waterproofing Compounds.

For Robertson Protected Metal for Roofing, Siding and Flashings, Robertson V-Beam Protected Steel Roof Decks and Robertson V-Beam Roofing, Robertson Ventilators, see Manufacturers' Index.

Daylighting Engineering Service

As a result of years of research and experiment, Robertson Engineers are equipped to prepare for architects, engineers and builders, complete daylighting layouts for any type of building. These layouts will take into consideration the type of work done in the building, the amount of light required for that work, the atmospheric and climatic factors which have a bearing upon the daylight, the associated problems of condensation, heat loss, etc. If you will send blue prints or sketches on any new or old building, the engineers will submit their recommendations without cost or obligation.

Through the scientific study of the problems of daylighting, the Robertson Engineers have been been able to reduce spoilage and accidents, cut light bills, and increase production.



The Robertson Daylighting Curve

Robertson Daylighting Engineers can take blue prints of a building and lay a daylighting curve like this across them to show, in advance, exactly how much light you will get at any point in the building, from any given area or placement of glass. A booklet on the Daylighting Curve sent on request

Robertson Skylights

Robertson Skylights represent one of the most successful solutions of the two most frequent and aggravating causes of skylight troubles—that is, leakage and glass breakage, growing out of (1) deflection (or sagging) of the glass supports, and (2) improper methods of holding the glass in place.

The detail drawing at the bottom of this page and the perspective drawing at the top of the following page show clearly how these difficulties have been overcome.

Eliminating Sagging—As shown in the drawings, the supporting member of the Robertson Skylight is a standard structural steel bar, designed and fabricated like the steel framework in a building, and as strong as the other structural members of the building. Its strength is calculable; all steel formulae apply to it. Size and weight of the bar is varied to suit exact conditions of load and span. The steel has a *minimum* thickness of $\frac{1}{16}$ in. Robertson Skylights therefore can be as wide as 20 ft. without need for supporting trusses.

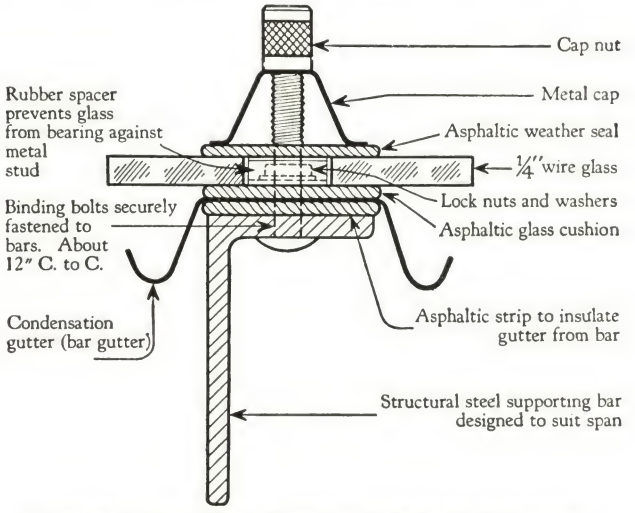
TRADE-MARK

Research has shown that deflection in the supporting member must not be more than 1/30th in. per foot of span. In Robertson Skylights there is never more than 1/30 in. deflection, even under a load of 40 lb. per sq. ft.

The Strength Is Permanent—Corrosion in skylights usually starts in the condensation gutter. In many skylights, this gutter is considered as a part of the supporting member, and when the gutter corrodes the supporting member is weakened. In Robertson Skylights (as you can see in the drawings) the condensation gutter is a separate unit and does not touch the supporting bar. Between it and the bar is a layer of asphaltic felt. If corrosion starts in the gutter there is little danger of it spreading to the bar of a Robertson Skylight.

Also, the supporting bar is no more affected by corrosion than is any other *structural* member of the building. It is so arranged that it is easy to reach with a paint brush from all sides. In extremely corrosive conditions, the bar can be galvanized, or covered with asphaltic coatings (such as used in the construction of Robertson Protected Metal).

Proper Cushioning of Glass—The second great cause of trouble in skylights is improper methods of holding the glass. Skylight glass has an irregular surface. When this surface rests on an unyielding bed, it makes contact at some points

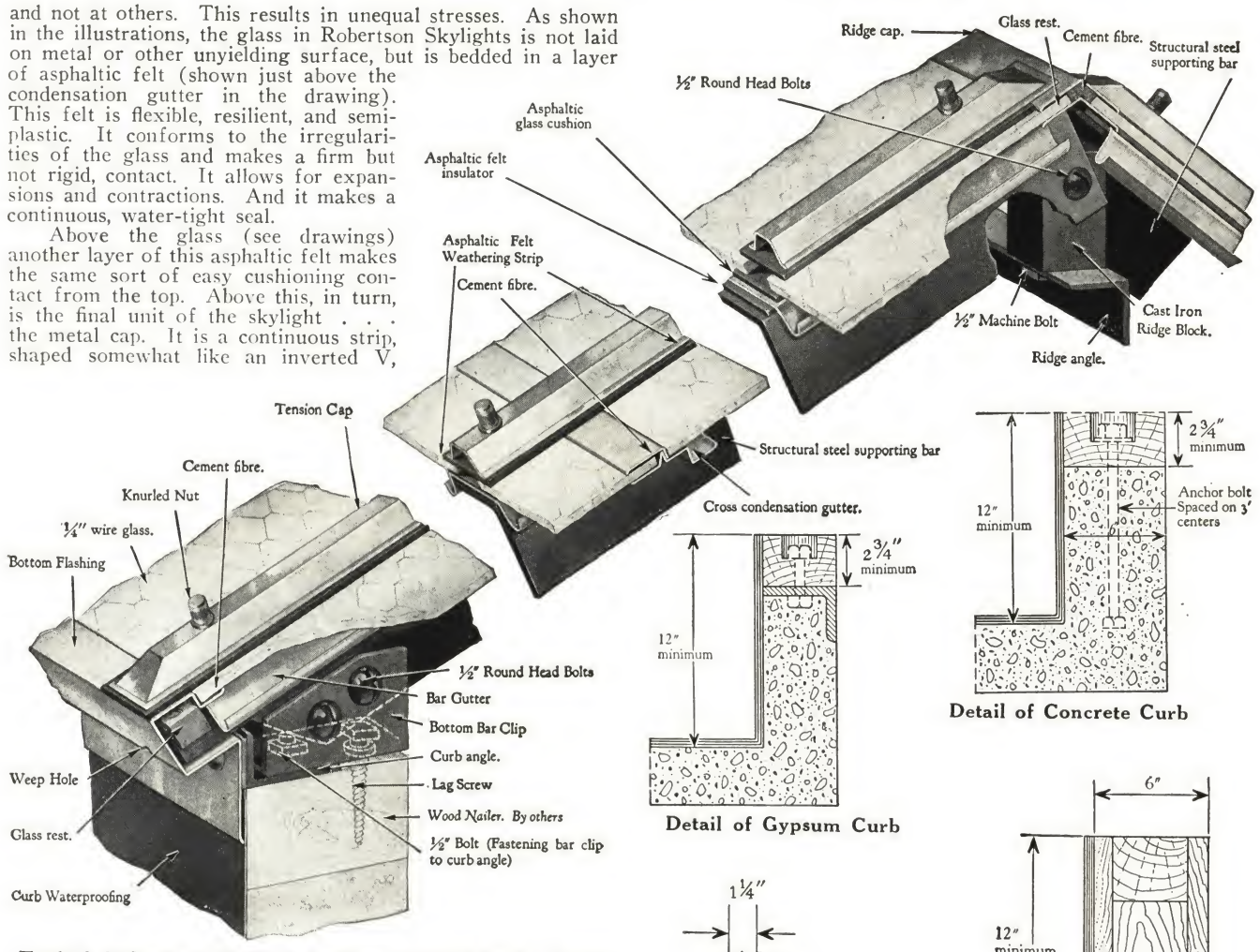


Cross-sectional View Showing Details of Robertson Glazing Construction

For further description see text herewith

and not at others. This results in unequal stresses. As shown in the illustrations, the glass in Robertson Skylights is not laid on metal or other unyielding surface, but is bedded in a layer of asphaltic felt (shown just above the condensation gutter in the drawing). This felt is flexible, resilient, and semi-plastic. It conforms to the irregularities of the glass and makes a firm but not rigid, contact. It allows for expansions and contractions. And it makes a continuous, water-tight seal.

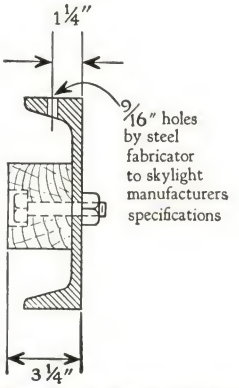
Above the glass (see drawings) another layer of this asphaltic felt makes the same sort of easy cushioning contact from the top. Above this, in turn, is the final unit of the skylight . . . the metal cap. It is a continuous strip, shaped somewhat like an inverted V,



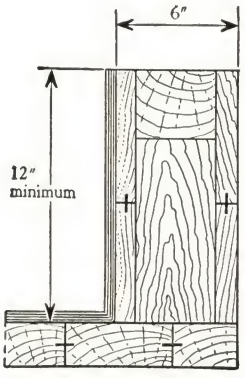
Typical Robertson Skylight Section (Double-Pitch Type)

Detail of Gypsum Curb

Detail of Concrete Curb



Detail of Steel Curb



Detail of Wood Curb

which runs the entire length of the joint. This cap is so designed that it has a spring-like effect. When tightened by a nut and bolt, it exerts a continuous, evenly distributed binding action along the length of the skylight, forcing the semi-plastic asphaltic layers into the depressions in the glass surface, yet its tension is so flexible it allows fully for expansion.

All Glass Butt Jointed—Another advantage of Robertson Glazing Construction is that where two panes of glass come together, they are always butt jointed, *never lapped*. The glass is all in the same plane: the panes can never slip; and there is no obstruction to form a lodging place for snow, water, or dirt. Top and bottom edges of glass are held in weatherproof copper cross-gutters.

A Typical Skylight Specification

The skylights shall be of the puttyless Type "A," manufactured by the H. H. ROBERTSON COMPANY of Pittsburgh, Pennsylvania, and shall conform to the following description:

The skylight bars shall be of standard rolled steel shapes that can be accurately figured for deflection. They shall support a combined snow and wind load of .. lb. per sq. ft. without a deflection greater than 1/30th in. per lin. ft. of bar length, measured center to center of supports. This deflection is to be calculated from deflection formula for simple beams.

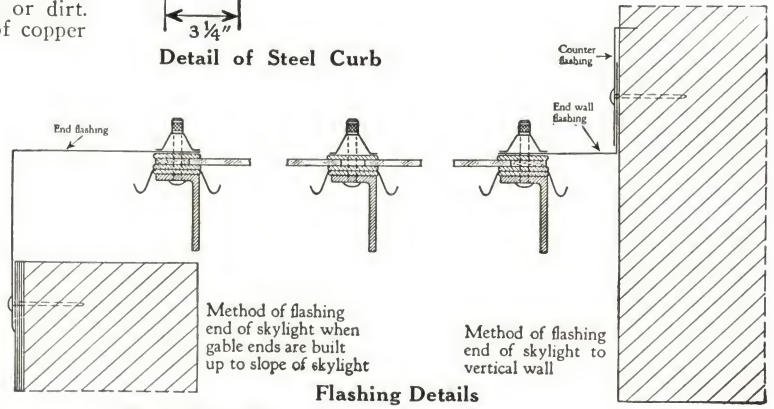
The bars shall be equipped with condensation gutters. They shall not be considered as part of the load-carrying member.

The glass shall be ¼ in. wire, and shall be embedded in a soft pliable and permanent asphaltic material.

The bars shall be covered with caps, which are to be fastened to bars by drive bolts and knurled nuts.

The trim shall be [copper], [aluminum] or [galvanized iron]. In case where two or more different materials meet, they shall be insulated from each other by asphaltic strips.

Detailed drawings shall be submitted by the manufacturer for the approval of the architect, engineer or owner.



Flashing Details

Curb Details

Details of built-up curbs of the commonly-used types are shown on this page. You can use these details to trace directly on your blue prints. Perfect curb details on your plan will often save two or three weeks in delivery time on skylights.

Show out-to-out dimensions of curbs and state whether skylight is to be double-pitch or hip type. If double-pitch, indicate whether ends are to be built up of the same material as curb, or are to be covered with metal, or to be of glass.

Robertson Double-Glazing

The Robertson Double-Glazed Skylight is one of the most important developments in glazing construction in recent years. It was originally designed to overcome the difficulties encountered where considerable differences in temperature exist between the inside and outside of buildings, and where the indoor air carries excess humidity, but its use has now spread far beyond that field. It has come into general popularity for office buildings, schools, lofts, garages and every other type of building where glass is used in the roof.

The great advantage of Robertson Double Glazing lies in the fact that the two layers of glass with an air space between them greatly increase the heat insulation. The heat transmitted through a single glazed skylight with ¼-in. glass is approximately 1.12 B.t.u. per sq. ft. per hour for each degree of temperature difference; whereas the heat transmission of Robertson Double-Glazing is only 0.133 B.t.u.

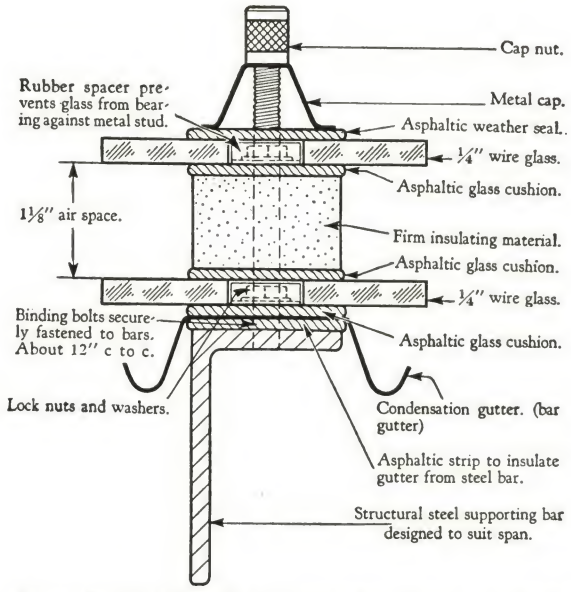
Robertson Double-Glazing minimizes condensation and drippage, reduces heat losses through skylights, and cuts fuel bills. In hot climates, it keeps buildings cool and comfortable in spite of high temperatures outside. In paper mills, textile mills, turbine rooms, power houses, swimming pools, and many other types of buildings where heat radiation and condensation are above the average it is of special benefit.

The large illustration on this page shows the method of attaching the skylights to the curb. The curb illustrated is concrete, but these skylights can be attached readily to steel, wood or any other standard form of construction. The illustration shows the position and attachment of the necessary flashings to make a weather-tight union between the skylight and the curb.

The Robertson perfected system of removing the water of condensation is shown in the drawings on this and the next page. Condensation on the underside of skylight glass is usually caused by differences between indoor and outdoor temperatures. Double glazing gives greater insulation between the indoor and outdoor temperatures, and this reduces condensation. Whatever condensation *does* occur forms principally between the layers of glass rather than on the inside of the bottom layer; trapped between the two panes, it cannot drip down into the building

Water on the upper surface of the lower pane runs down the slope and out through a ¼-in. weepage space (see detail of curb) at the bottom edge of the pane, whence it drips into the interior gutter. This interior gutter runs continuously along the curb and empties into conductor pipes (as shown) spaced at regular intervals. These pipes carry water onto the roof, or, if preferred, into the building.

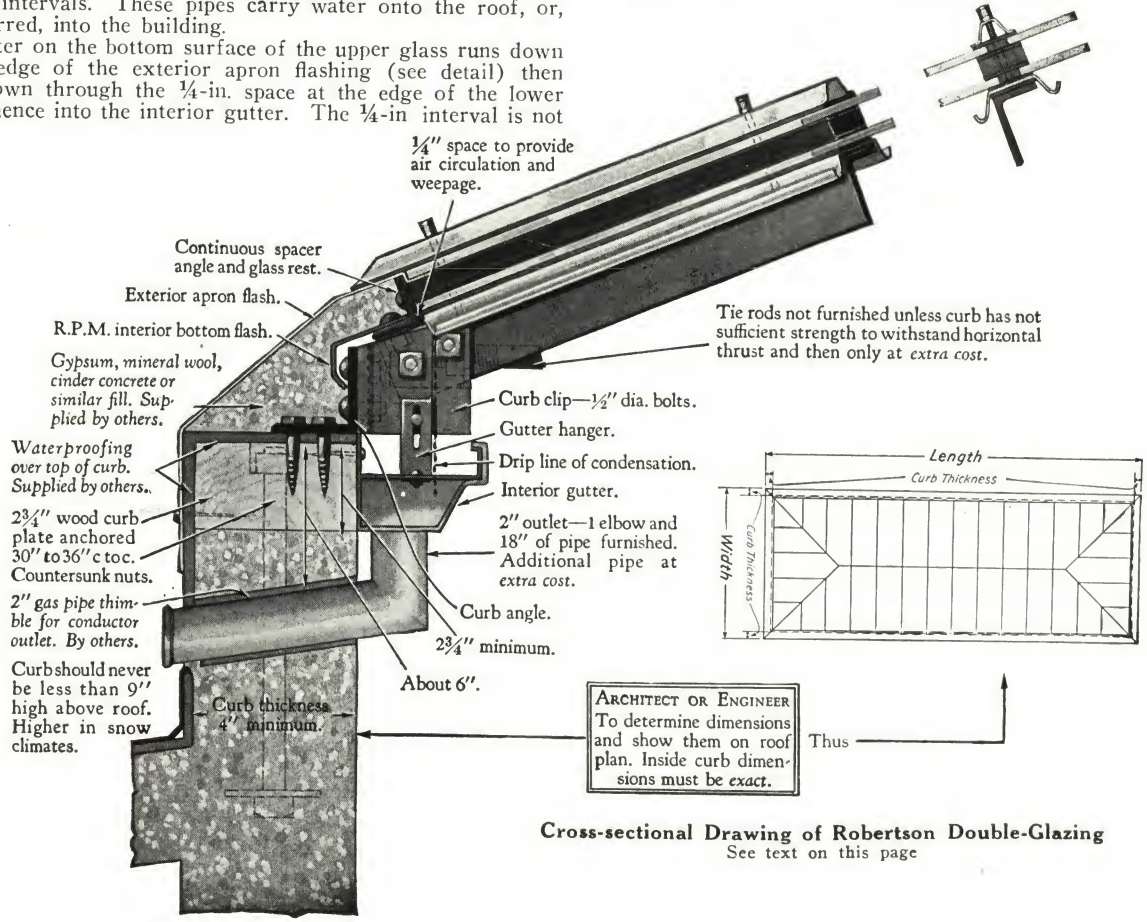
Water on the bottom surface of the upper glass runs down to the edge of the exterior apron flashing (see detail) then drips down through the ¼-in. space at the edge of the lower pane; thence into the interior gutter. The ¼-in interval is not only an outlet for water but also provides for the slow continuous movement of air between the two layers of glass, and minimizes fogging.



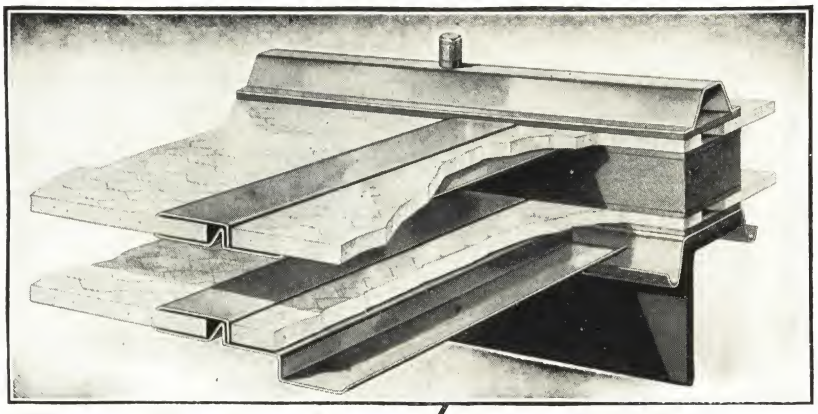
Cross-sectional Details of Robertson Double-Glazing
For general information see text on this page

Any water that may form on inside of the lower pane is caught in cross condensation gutters (as shown in the cross-section of the large detail and in the "close-up" in the upper left hand corner of the next page). Water gathering in these cross gutters empties into the bar gutters running up and down the slope, then into the interior curb gutters and out.

Interior bottom flashings should always be of Robertson Protected Metal (which is impervious to corrosion). Other sheet metal parts and flashings may be of copper, aluminum, galvanized steel or other suitable material. Interior gutters are made of the same materials as the trim.



Cross-sectional Drawing of Robertson Double-Glazing
See text on this page

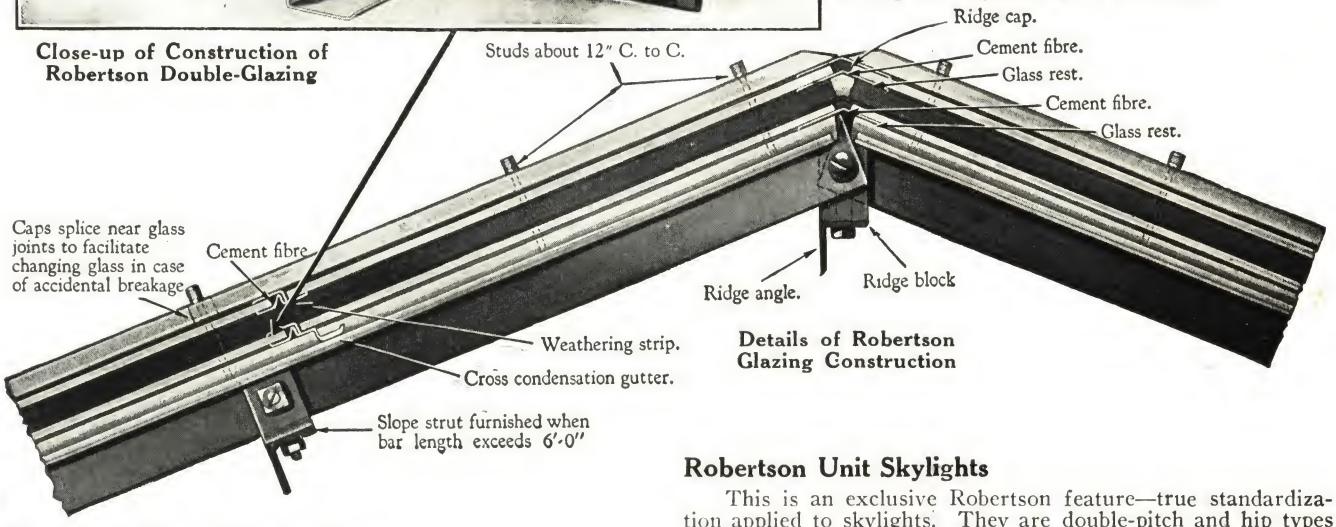


Close-up of Construction of Robertson Double-Glazing

Glazing Available in All Forms

Robertson Glazing Construction is available in all forms: double-pitch and single-pitch skylights, hip skylights, monitor and special sash, sawtooth sash, sidewall sash, fixed and operating; and complete glass roofs. Also in standardized unit skylights.

The H. H. ROBERTSON COMPANY is equipped to take your blueprints or rough preliminary sketches and recommend the most suitable type of glazing construction to meet the situation . . . to suggest the number of skylights or sash that will be needed, what size they should be and where they should be placed. Send for 48-page Robertson booklet on Daylighting which explains many of the fundamental rules governing the daylighting of buildings.



Details of Robertson Glazing Construction

Depressed Head Construction

The Robertson method of installing single-pitch skylights (known as depressed-head construction) is illustrated at the bottom of this page. Note how the head of the skylight is inserted under the roofing material, and the bottom of the skylight is extended out over the roofing material, to facilitate the free flow of water, and to eliminate any place of lodgment for snow, water, ice, or dirt.

Depressed head construction eliminates the necessity for curbs and for "saddles" or "crickets" to carry off the water. It can be used with any type of roof material or roof coverings, where the slope of the roof will permit use of skylights. Slope must never be less than 2½ in. in 12 in.

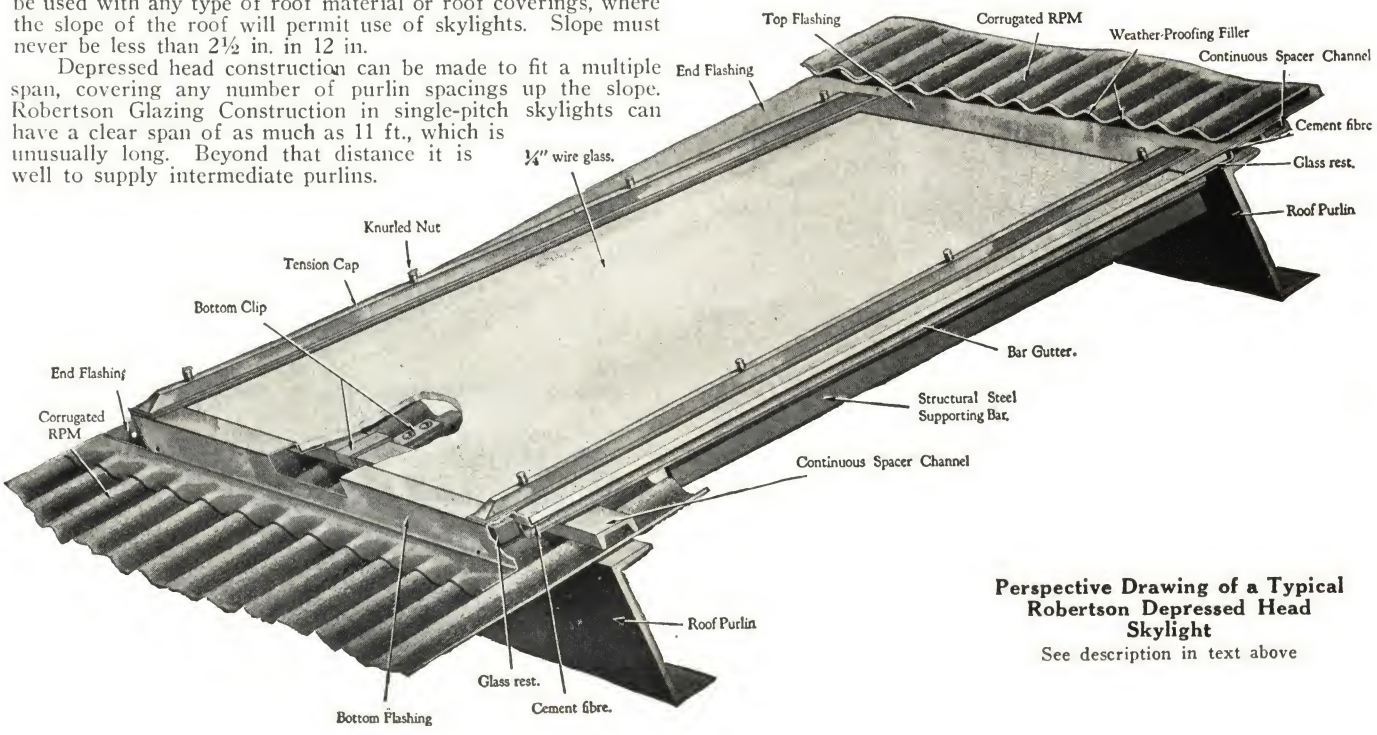
Depressed head construction can be made to fit a multiple span, covering any number of purlin spacings up the slope. Robertson Glazing Construction in single-pitch skylights can have a clear span of as much as 11 ft., which is unusually long. Beyond that distance it is well to supply intermediate purlins.

Robertson Unit Skylights

This is an exclusive Robertson feature—true standardization applied to skylights. They are double-pitch and hip types in units of standard widths from 3 to 20 ft. and in any desired length.

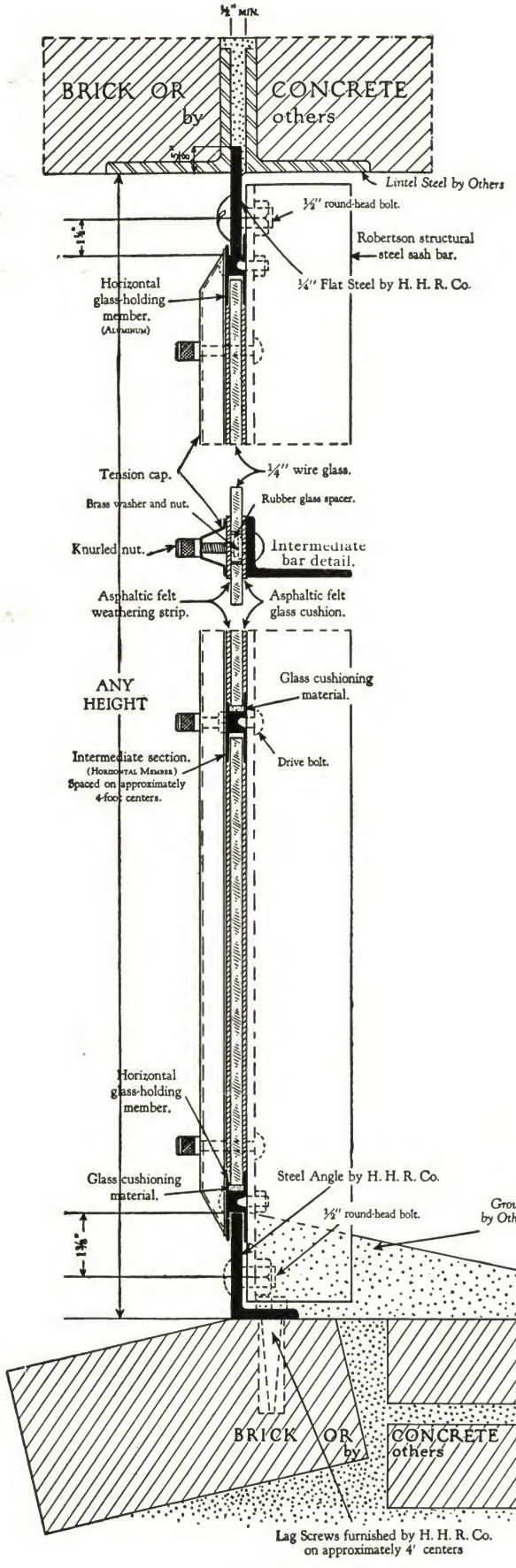
Ordering in Even Foot Widths

Skylights are primarily planned in even foot widths. If ordered on that basis, considerable savings in both time and money can often be made, and much quicker deliveries are possible. However, Robertson Skylights can be delivered to you in any widths you desire. Widths should be figured on the out-to-out of curb.

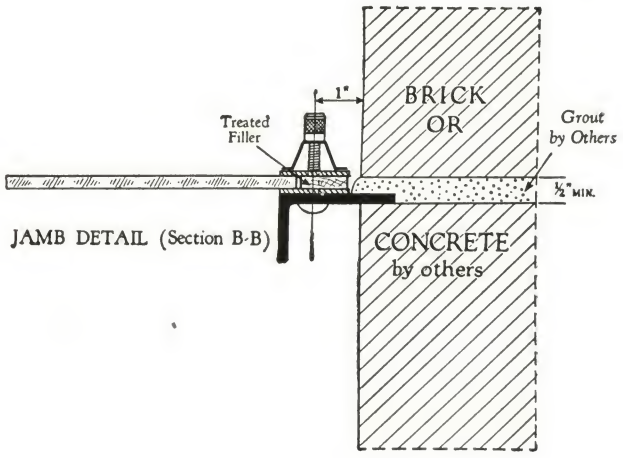


Perspective Drawing of a Typical Robertson Depressed Head Skylight

See description in text above



CROSS-SECTION DETAIL
(Section A-A)



JAMB DETAIL (Section B-B)

Details of Robertson Structural Sidewall Sash for Buildings of Brick or Concrete

For description see text

Robertson Structural Sidewall Sash

The name of this Robertson product suggests what it is—an industrial sidewall sash with load-carrying members of structural steel. The glass is supported on standard rolled steel bars placed vertically and attached (in the case of steel buildings) to the girt framing.

The special features and advantages of Robertson Structural Sidewall Sash are:

Greater Strength—All supporting members are of structural steel instead of light steel sash. Bars are designed like beams and can take care of any required loading. Glass is ¼-in. wire glass instead of ⅛-in. window glass.

Longer Lived—The structural steel supporting bars provide a weight of metal and a consequent resistance to corrosion that light steel sash cannot approach. On the outside, the only exposed metal part is the tension cap, which is made of corrosion-resistant aluminum. Horizontal members are few and are made of aluminum almost flush with the surface of the glass, so that there is no place for corrosive elements to lodge. Glass is held in resilient asphaltic felt strips; no metal touches it; no putty is used.

Low Maintenance—There is less glass breakage; no puttying to be done; and little or no painting. The aluminum tension caps and the horizontal members never require paint.

Remarkably Adaptable—Robertson Structural Sash is designed and fabricated to fit sidewall openings of any dimensions or proportions.

Easier to Clean and Keep Clean—The glass panes are large (2x6 ft. maximum). There are fewer corners and bars, and fewer places for dirt and dust to lodge. All horizontal members practically flush; it is possible to wipe, in one operation, a section of glass 6 ft. in height.

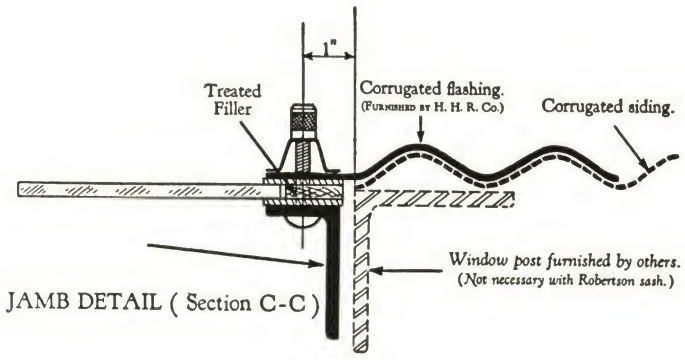
More Light—The large panes give more effective lighting than the small panes of ordinary sash set in a network of bars.

Better Appearance—The large panes provide a fine architectural effect; they form an appropriate relationship with the masses and lines of a structure. The bright aluminum caps harmonize in tone and color with the glass.

Key to Illustrations—Illustrations on this page show cross-sectional views of details of Robertson Structural Sash applied to buildings of brick or concrete.

Section A-A (vertical section through sash) indicates method of attaching at head and sill. With brick, Robertson Structural Sash is fitted at the head into space left by steel contractor between lintel angles. In concrete, sash is fitted into a similar space provided by concrete contractor. At sill, sash is fastened to brick or concrete by means of lag screws (as shown).

Section B-B is horizontal sectional view through the sash and its attachment to window jamb. As indicated, position of sash bar is modified at this point; glass-holding members are attached to longer leg of the bar, and the longer leg is inserted into the brick or concrete. Sash is weatherproofed by grouting as shown.



JAMB DETAIL (Section C-C)

Key to Illustrations—Cross-sectional views on this page show Robertson Structural Sash applied to buildings with sidewalls of corrugated sheets.

Section A-A (vertical section through sash) indicates method of attaching sash to head and sill. Girts placed as shown in Section A-A are recommended; but Robertson Sash can be adapted to any type of steel framework.

It is also adapted to window openings of any height. Panes of glass come in any height up to 6 ft. For openings more than one pane high, union between upper and lower edges of pane made by standard intermediate section shown in Section A-A.

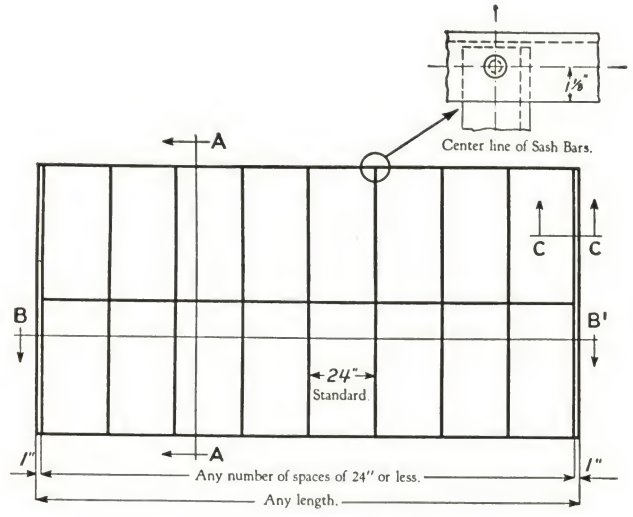
Girts to which sash is attached to be furnished and punched by building owners. Section B-B shows typical girt-punching layout. Center lines through angle lines in B-B indicate exact location of girt punchings. Sash bars should be spaced on 24-in. centers if possible, but can be varied to meet requirements of *any* opening.

Section C-C (horizontal sectional view through the sash and its attachment to window jamb) shows how Robertson Structural Sash is weatherproofed at the joints. Because of strength and rigidity of Robertson Sash bars, no window posts needed.

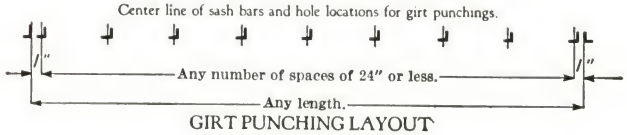
Tension caps, which form outside or weathering member, furnished in aluminum, copper or galvanized steel.

Operating Devices

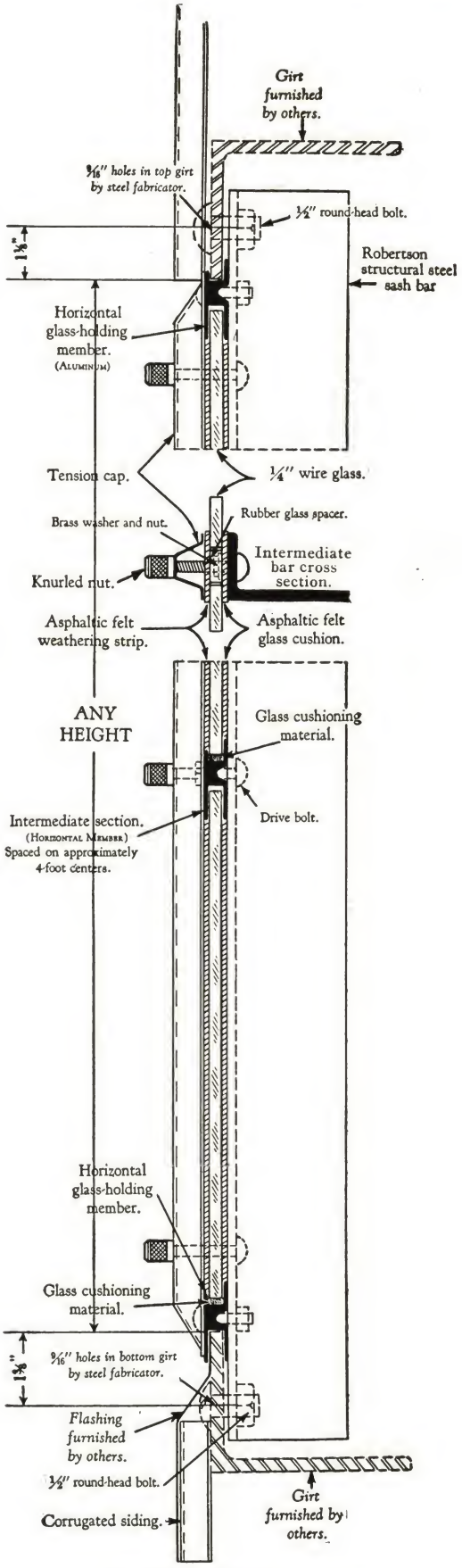
If operators are desired for sidewall sash we can furnish tension or torsion types, with chain, handwheel, pole or electric drives.



SASH ELEVATION



GIRT PUNCHING LAYOUT
(Section B-B)



CROSS-SECTION DETAIL
(Section A-A)

Details of Robertson Structural Sidewall Sash for Corrugated Buildings

ESTABLISHED 1888

BARNEY GOLDMAN, President

SUPERIOR SKYLIGHT COMPANY, INC.

Automatic Gravity Stage Ventilators
95 Webster Avenue
LONG ISLAND CITY, N. Y.

Products

SUPERIOR AUTOMATIC GRAVITY STAGE VENTILATOR.

SUPERIOR FOUR-IN-ONE PROJECTION ROOM VENTILATOR.

For Superior Roof Leader Connections and Expansion Roof Fittings for Vent Stacks, see Manufacturers' Index.

Superior Automatic Gravity Ventilator for Theater Stages and Auditoriums

A combined ventilator and skylight. Universally approved for use over the stages of theaters, fraternal buildings and school auditoriums. Efficient, reliable and automatic in action in case of fire.

Operation—The operation and automatic action depend on a series of hempen cords, each of which is attached to a sash or ventilator and which are immediately released, either independently or all at once, by the melting of fusible links, such as are in common use on fire doors, sprinkler systems, etc. They will melt and release the ventilators at a temperature of 160° F.—long before the flames reach them.

The ropes connecting with the sash are brought down to the stage and attached to a triangle plate which is connected with one main rope to the stage floor. Chains are also attached to the ropes permitting the manual opening and closing of the sash from the stage floor.

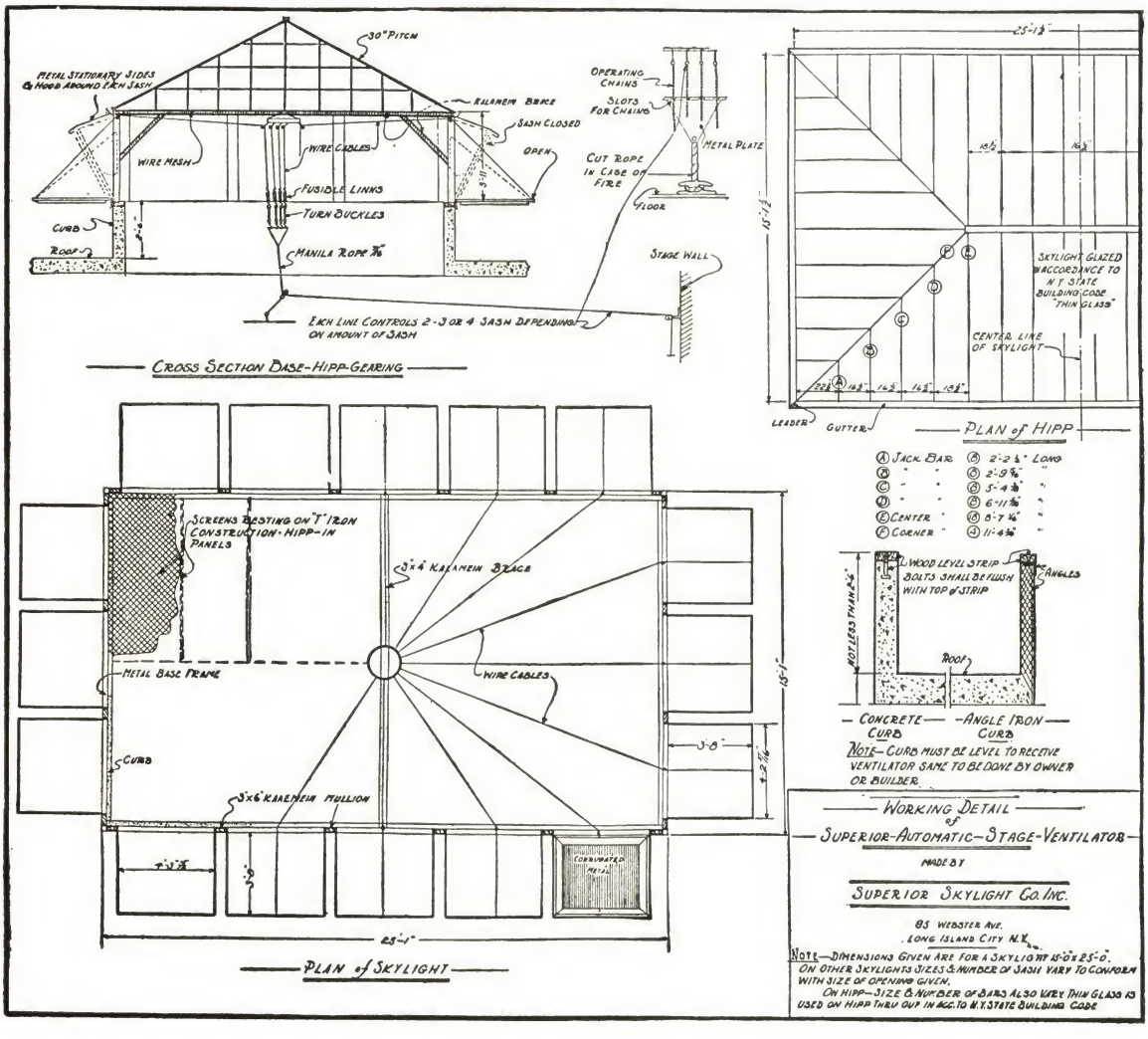
The automatic ventilator is to be mounted on an ordinary curb of concrete or angle iron frame made level with the wood plate set flush with the outside of the curb. The curb should be not less than 2 ft. 6 in. high from the finished roof in order that snow drifts and other encumbrances will not prevent outward gravitation.

The roof of the ventilator skylight is to be of first class hip ridge construction with heavy bars and condensation gutters, glazed with a thin glass in accordance with the New York Building Code and made perfectly watertight. A No. 12 galvanized 1-in. underwriters' wire mesh is placed underneath this roof to gather in the glass which invariably breaks from excessive heat in case of fire.

Construction and Installation—We manufacture these ventilators to any specified dimensions using standard gauges of galvanized iron or copper, and will deliver them, ready to assemble, to any part of the United States, Canada and Europe.

We will supervise their installation and guarantee that they will meet with the approval of local fire marshals, inspection bureaus, fire insurance underwriters, etc.

Endorsement—Superior standard automatic ventilators are constructed in a manner approved by the National Board of Fire Underwriters, and in accordance with "An Ordinance Regulating the Construction and Equipment of Theater Buildings, and Auditoriums as approved by the National Fire Protection Association and the Board of Standards of the City of New York."



ESTABLISHED 1880

LIONEL VALLAS

Manufacturers of Sheet Metal Products

2846-50 West Lake Street, CHICAGO, ILL.

See Manufacturers' Index for our Hollow Metal Windows and Doors, Roof Flashing and Ventilators

LIONEL FULL VENTILATING SKYLIGHTS

Construction

Lionel Full Ventilating Skylights are built with truss supports built up of 1½x2x⅛-in. angle iron spaced not more than 8 ft. on centers. (Spans of more than 8 ft. are supported with heavier trusses.)

All parts are bolted, riveted or interlocked.

Materials

The bars, ridge, rails, gable ends, caps and apron are all constructed of 18-gauge galvanized iron, aluminum, copper, etc.

Weathertight

Lionel Full Ventilating Skylight is absolutely stormproof because of its scientific construction. (Note details.)

The method of forming gutter at the ridge and at curb as well as the construction of skylight bars, absolutely prevents dripping of condensation.

Operators

A heavy rack and pinion type operating device of special design is a part of Lionel Ventilating Skylights; comes equipped with either endless chain or detachable rod with crank.

Glazing

¼-in. ribbed wire glass is used in these skylights securely held in place with putty and skylight caps. Skylights may be purchased with or without glass.

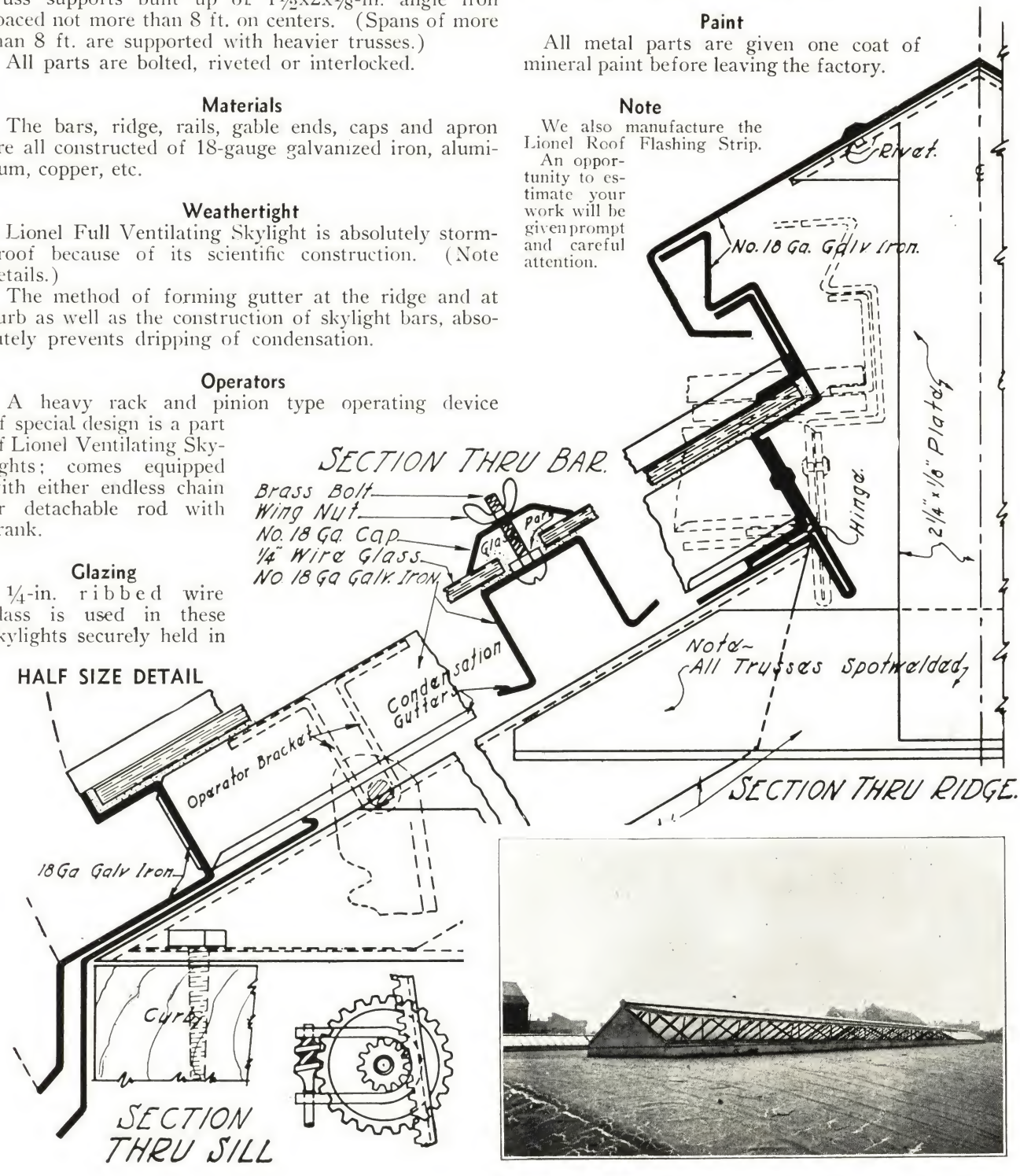
Paint

All metal parts are given one coat of mineral paint before leaving the factory.

Note

We also manufacture the Lionel Roof Flashing Strip.

An opportunity to estimate your work will be given prompt and careful attention.



ESTABLISHED 1873

E. VAN NOORDEN COMPANY

Puttyless Skylights

TELEPHONE
Highlands 3040, 3041, 3042

100 Magazine Street, near Massachusetts Avenue
BOSTON, MASS.

For our page on Roof Ventilators, see Manufacturers' Index

Rolled Steel Puttyless Skylights—"Anchor-bar" Type (Patents No. 931638 and No. 1140909)

The Van Noorden rolled steel "Anchor-bar" puttyless skylight is designed particularly for large skylight areas, and is a most economical construction for skylights where the bar length exceeds 8 ft. *Fewer purlins* and *steel supports* are required than for the usual skylight construction.

The structural parts of rolled steel, and the trim of sheet metal (generally copper), form a combination which can not be surpassed; namely—steel for strength and copper for weather protection.

Bar—The bar consists of a tee and angle combination as shown. The angle member serves as a gutter for condensation. The glass rests loosely on cushion of pure wool felt.

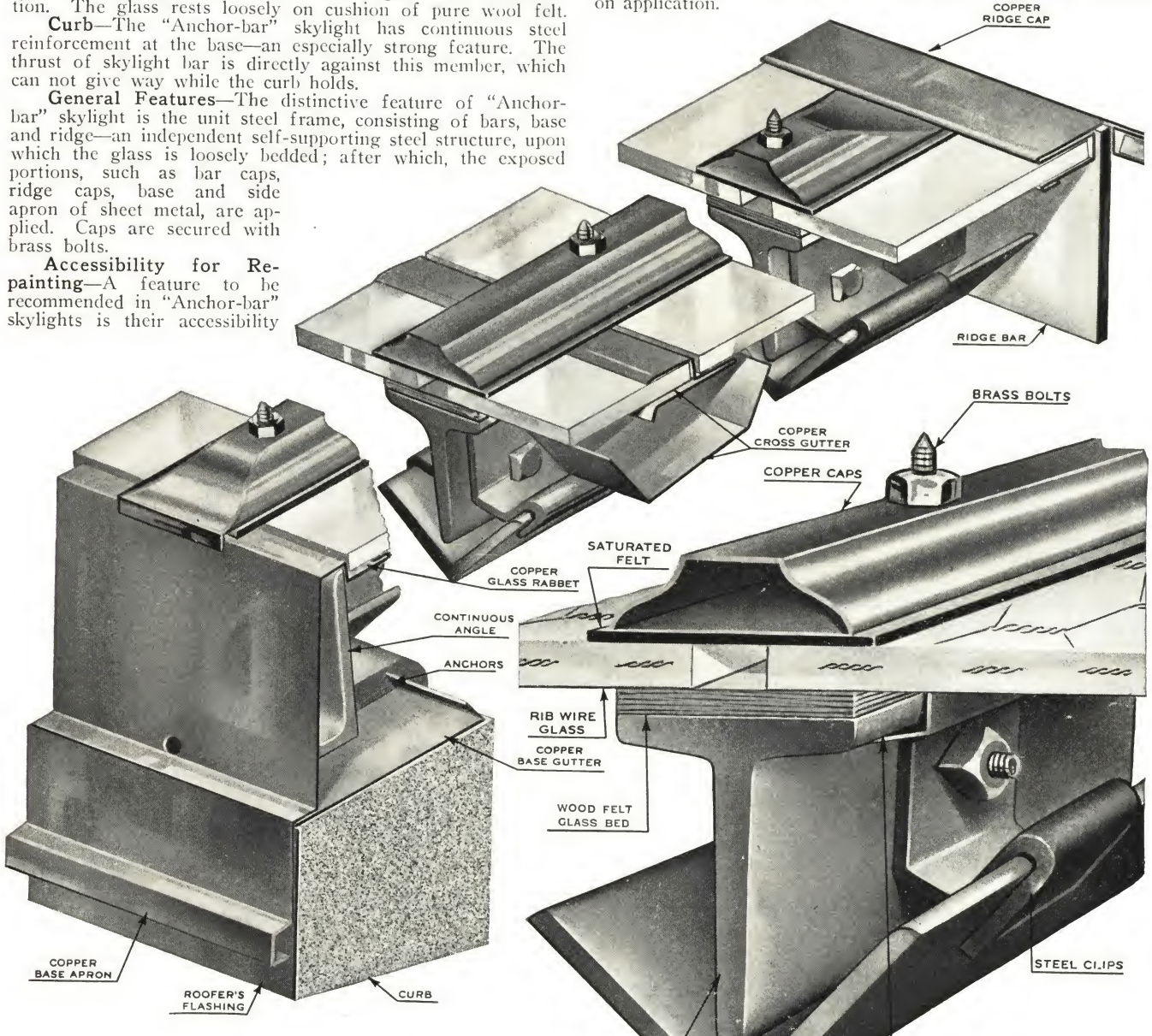
Curb—The "Anchor-bar" skylight has continuous steel reinforcement at the base—an especially strong feature. The thrust of skylight bar is directly against this member, which can not give way while the curb holds.

General Features—The distinctive feature of "Anchor-bar" skylight is the unit steel frame, consisting of bars, base and ridge—an independent self-supporting steel structure, upon which the glass is loosely bedded; after which, the exposed portions, such as bar caps, ridge caps, base and side apron of sheet metal, are applied. Caps are secured with brass bolts.

Accessibility for Repainting—A feature to be recommended in "Anchor-bar" skylights is their accessibility for the easy re-painting of the rolled steel portions. The sheet metal portions, being preferably of copper, are impervious to weather conditions.

Adaptability—"Anchor-bar" skylights are recommended wherever overhead light is desired. Inquiries should state overall length of outside of curb, bar length, pitch of skylight (5 in. to the foot or more) and distance between intermediate purlins.

"Anchor Truss Bar"—"Anchor truss bars" are used where bar length is more than 10 ft., unless intermediate purlins are provided. Truss bars are self-supporting for a bar length up to 15 ft. The saving effected in the steel frame support is far greater than the excess cost of truss bar construction. Details on application.



SECTIONAL VIEW ABOUT HALF SIZE

BAR FULL SIZE

VENT-O-LITE COMPANY

Manufacturers of Solderless Ventilating Skylights

One North La Salle Street, CHICAGO, ILL.

Product

SOLDERLESS SKYLIGHTS, Ventilating and Stationary.

TRADE-MARK

Construction Features of Vent-O-Lite Skylights

Supporting Trusses—Vent-O-Lite Skylights are supported by steel trusses spaced approximately 6 ft. on centers. These trusses carry the entire load and require no special preparatory construction, except the curb.

Panels, Ridge, etc.—The bars, rails, ridge, end panels, etc., are all constructed of 18 gauge galvanized iron, and the entire skylight is made rigid and weathertight *without the use of solder.* Ample provision is made for condensation at all necessary points.

When desired, aluminum or copper construction can be furnished.

Operating Device—A heavy rack and pinion type operating device of special design is furnished as an integral part of Vent-O-Lite Skylights. This device facilitates smooth and even operation.

Glass—¼-in. wire glass set in putty and securely held by 18 gauge galvanized iron glazing caps.

Flashing—Vent-O-Lite standard curb flashing consists of a 6-in. strip of heavy 3-ply asphalt felt underneath a 24 gauge galvanized iron curb strip which extends 2 in. below the top of the curb.

Paint—The entire skylight is given one coat of mineral paint before it leaves the factory.

Sizes—Vent-O-Lite Skylights are manufactured in standard widths of 6, 8, 10, 12 and 14 ft. and can be furnished to any length in multiples of 2 ft. Greater widths can be furnished when required.

Ventilating Feature—Vent-O-Lite Skylights can be furnished either part or full length ventilating as required.

Shipments from Stock

Since we maintain large stocks of standard sizes at all times, we are always able to make prompt shipments of Vent-O-Lite Skylights, to all parts of the United States.

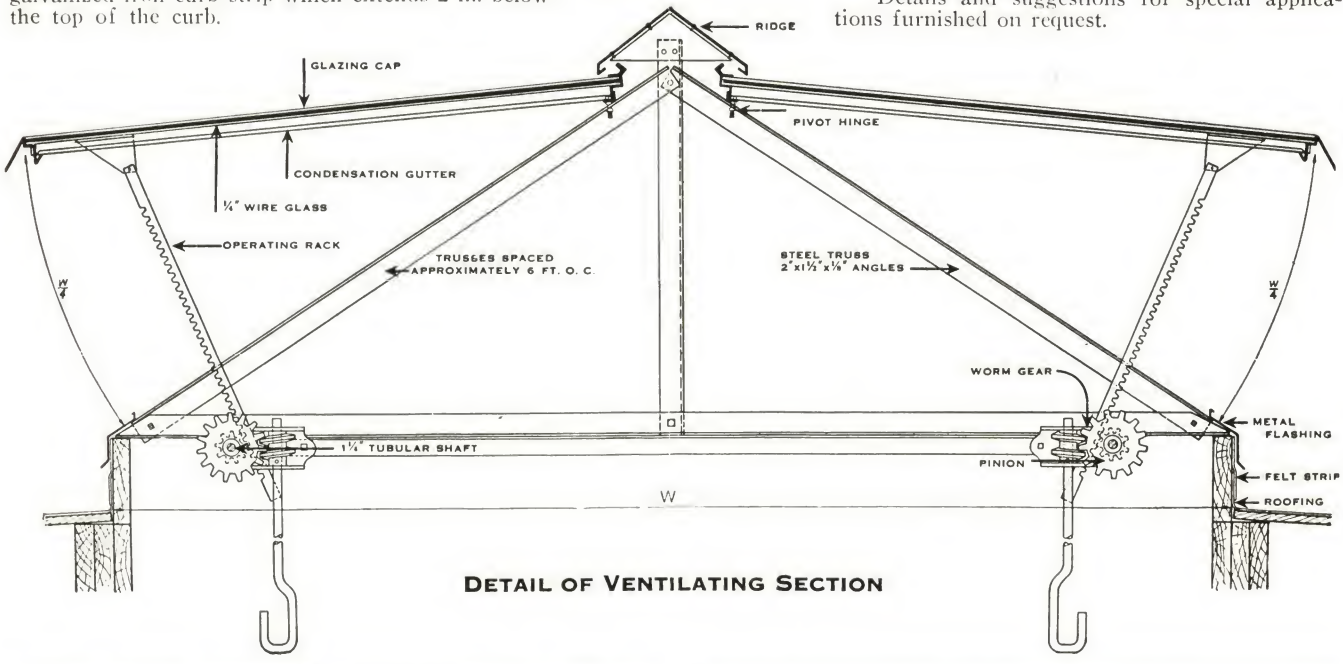
Erection

These skylights are regularly quoted with glass and erection included. However, when desired, shipment may be made knocked down for erection by the customer.

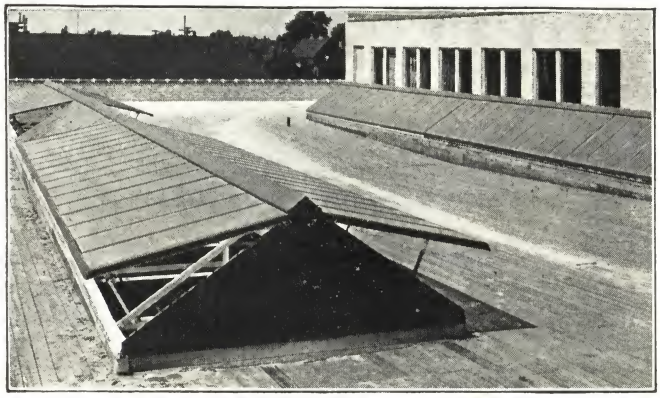
Vent-O-Lite Service

Vent-O-Lite Service includes assistance in designing for better light and ventilation in garages, industrial buildings, etc.

Details and suggestions for special applications furnished on request.



DETAIL OF VENTILATING SECTION



Vent-O-Lite Skylights, 10 Ft. Wide
Widths 6 ft. to 10 ft. open from ridge to curb

12x118-ft. Vent-O-Lite Skylight
Widths of 12 ft. and over open the upper section only, as shown here

ÆOLUS DICKINSON

INDUSTRIAL DIVISION PAUL DICKINSON, INCORPORATED

Ventilators, Scuppers and Exhaust Heads

TELEPHONE
Lafayette 1862, 1863

3322-3342 South Artesian Avenue
CHICAGO, ILL.

Products

"Æolus" Improved Double Syphon Roof Ventilators; Dickinson Cast Iron Exhaust Heads and Dickinson Cast Iron Scuppers.

Also Dickinson Cast Iron Floor Ventilators, Mushroom Type and Cast Iron Roof Drains.

"Æolus" Improved Double Syphon Roof Ventilators

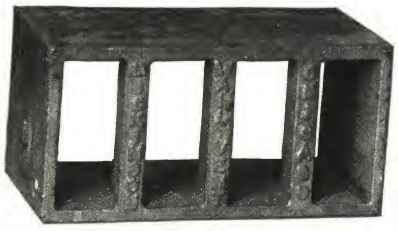
"Æolus" ventilators are used by big industries and railroads as well as on hotels, schools and office buildings. Made of any sheet metal or cast iron. No mechanical parts to get out of order. No maintenance expense.

A few recent installations include:

Crane Co.
Commonwealth Edison Co.
Peoples Gas Light & Coke Co.
Atchison, Topeka & Santa Fe Ry.
Illinois Central R. R.
Oxweld Acetylene Co.

Double Syphon Roof Ventilator

Dickinson Cast Iron Wall Vent



Size—8 ins. long, 4 ins. high, 4 ins. deep.

This vent is designed to provide for air circulation in attic spaces, enclosed spaces under porches, spaces under buildings not having basements, and similar "dead air" spaces. Vent can be installed in concrete, stone or brick walls. Furnished with bird or fly screen if desired.

Information

Further information, prices, etc., gladly supplied on request.

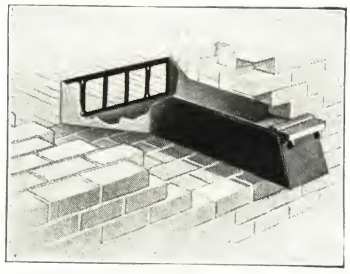
SIZES AND CAPACITIES ÆOLUS IMPROVED DOUBLE SYPHON VENTILATORS (PATENTED)

Temp. Difference 69° F. outside, 70° F. inside — From Tests Made by L. E. Davies of Armour Institute

Wind velocity, miles per hour	Period of Time	Size of Ventilator, in.									
		12	14	16	18	20	24	30	36	40	48
		Cubic Feet of Air Through Ventilator									
5	Per min.	435	589	769	973	1,075	1,725	2,689	3,879	4,779	6,901
	Per hr.	26,100	35,340	46,140	58,380	64,500	103,500	161,340	232,740	286,740	414,060
10	Per min.	627	857	1,121	1,417	1,745	2,513	3,919	5,651	6,965	10,049
	Per hr.	37,620	51,420	67,260	85,020	104,700	150,780	235,140	339,060	417,900	602,940
15	Per min.	901	1,227	1,606	2,030	2,510	3,601	5,615	8,096	9,975	14,403
	Per hr.	54,060	73,620	96,360	121,800	150,600	216,060	336,900	485,760	598,500	864,180
20	Per min.	1,143	1,559	2,041	2,580	3,178	4,575	7,144	10,290	12,675	18,302
	Per hr.	68,580	93,540	122,460	154,800	190,680	274,500	428,640	617,400	760,500	1,098,120

Battery of Double Syphon Ventilators on Ridge of Industrial Plant Roof

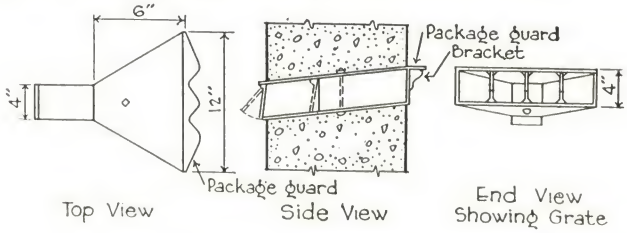
Dickinson Cast Iron Scuppers



They only cost a few dollars apiece but are worth their weight in gold when a fire occurs. Construction is entirely of light gray cast iron. They are simple, effective, durable, easily installed and approved by Underwriters' Laboratories, Inc.

Made in 9 to 24-in. sizes.

Used in the new Santa Fe warehouses at Los Angeles, Cal., and many other sprinklered warehouses.



THE ALLEN CORPORATION

Engineers and Manufacturers of Ventilating Appliances

14th and Lafayette Streets, DETROIT, MICH.

SALES ENGINEERS IN ALL PRINCIPAL CITIES

Products

ALLEN TURBINE and ALCO STATIONARY ROOF VENTILATORS, BASES and DAMPERS.

AUXILIARY ELECTRIC FAN VENTILATORS.

ALLEN ELECTRIC EXHAUST FANS.

The Allen Turbine Ventilator—Leakproof, Positive, Efficient

The Allen Principle—Mounted on rugged, but extremely sensitive bearings, the Allen turbine head develops great angular velocity. Because the peripheral speed of its blades exceeds the velocity of the propelling wind, it permits no air, rain or snow to enter the driving side of the head, and thereby creates great suction on the lee side of all blades. The turbine principle is

The Allen Turbine Ventilator

supplemented by an exclusive Allen patented feature, an interior displacement cone, on which are mounted vanes properly designed to distribute the exhausted air to the low pressure areas created by the swiftly revolving blades. *Down-drafts* are eliminated, due to the fact that no air can enter the head of the ventilator to be displaced at the expense of air being exhausted.

Allen Construction—Allen Turbines are constructed of "Titecote" galvanized Armco ingot iron or cold rolled copper of heavier gauges than usually found in ventilators. All parts are die-cut and formed, and are jig fabricated, insuring perfect uniformity of product. All castings subjected to any strain are malleable. Spot-welding sheet metal parts insures permanence under the hottest conditions, where solder can not be relied upon.

Bearings are constructed of Nitralloy "G" steel and Ampco bronze. The two-point suspension of the rotor shaft insures maximum freedom of movement with minimum friction. Both bearings are packed with sufficient grease of lasting quality to lubricate the friction points for years. Alemite connections permit repacking should lubrication become necessary.

Allen Turbines are finished inside and outside with two coats of Allen Tinners Green. For acid and other extreme conditions, the Marine type, finished with three coats of Bitumastic compound, may be had at a slight extra cost.

SIZES, WEIGHTS AND DISPLACEMENTS OF ALLEN TURBINE VENTILATORS

Size, in. (Throat diam.)	Extreme height, in.	Width over all, in.	Weight, lb.		Displacements, cu. ft. per hr. T1-T2 = 20° Vent. height = 10 ft.	
			Vents	Crated	Wind vel. = 4 m.p.h.	Wind vel. = 8 m.p.h.
8	24	16	13.	19.5	17,300	21,600
10	25	18	16.5	25.5	26,500	32,500
12	27	20	24.3	36.5	38,600	46,200
15	33	24	31.5	49.	54,000	69,000
18	35	28	45.	82.5	85,200	102,100
20	37	31	54.5	99.5	105,100	125,600
24	45	37	96.5	157.5	149,000	185,000
30	52	46	122.	226.	225,000	272,000
36	55	48	150.	270.	281,000	330,000
42	59	58	232.	453.5	324,000	414,000
48	63	66	267.	537.	360,000	473,000

Specifications—All roof ventilators to be turbine type, equipped with interior displacement cone and multi-vanes, constructed of Armco ingot iron (or copper), and painted; as patented and manufactured by THE ALLEN CORPORATION, 14th and Lafayette Streets, Detroit, Mich.

The Alco Ventilator

This ventilator is designed to meet the demand for a ventilator low in initial cost, yet capable of meeting conditions presented by the average ventilating problem.

The Alco is stormproof, free from down-drafts, has a large displacement capacity and is quality built of Armco ingot iron of heavy gauge and is protected by a coating of Allen Tinners Green Paint.

These ventilators have a pleasing contour and are made in a series of sizes from 8 to 60 in. in diameter.

Allen Exhaust Fans

These fans embody advanced engineering design and practice. They are equipped with patented one-piece full thrust propellers which deliver a solid shaft of air with uniform velocity from the center of the hub to the tip of the blade. There is no dead area in the center of the air stream generated by the Allen propeller. Highest quality motors are used of specially totally enclosed design. A one-piece ring casting, constructed of aluminum, insures beauty of appearance as well as rigidity and lightness. Allen Exhaust Fans are made in sizes ranging from 12 to 30 in., and their efficiency means a propeller of lesser size, slower speed and smaller motor which insures quiet, economical operation.

Power Fan Auxiliaries

Power fan auxiliary units may be had in either Allen or Alco for handling extraordinary conditions.

When the fan is not operating, the ventilators function freely as gravity units.

Write for further information and prices.

Engineering Service

THE ALLEN CORPORATION maintains a staff of engineers to assist you in ventilating problems. This service is free and places you under no obligation. Write for catalogue and additional information.

ESTABLISHED 1906

AREX COMPANY

Industrial Ventilating Engineers

TELEPHONE
State 2772

333 North Michigan Avenue Building
CHICAGO, ILL.

FACTORY AND WAREHOUSE
GARY, IND.

EASTERN OFFICE: 132 Nassau Street, New York, N. Y.—Telephone, Beekman 3-3448
BRANCH OFFICES IN PRINCIPAL CITIES

Products

AREX-AUSTOR (Air Exhauster), the Original Siphonage Roof Ventilator—*"The Power Fan's Only Rival."*

ECONOMY VENTILATOR (Plain Type).

Also "Arin" Anti-draft Window Ventilators installed in sash.

For "Arin" Adjustable Louvers, see Manufacturers' Index.

Arex-Austor

Scientific Design — This ventilator, designed on the original siphonage principle, assures by natural means constant, positive and uniform ventilation. The siphon or vacuo chambers are so placed as to concentrate all wind currents into a steady pulling force; by means of deflections opposite each siphon (see sectional view on following page) a powerful vacuum is created, drawing out air at a tremendous speed. Foul air, warm air, fumes, gases, vapors, steam and smoke are quickly and completely removed. Passing wind plays upon the siphons so as to accelerate the outflow of foul air from interior of building, but it permits none of the outside wind to enter the ventilator. Every opening is an outlet. Under ordinary conditions Arex-Austor will remove 300 cu. ft. of foul air per square inch per hour on a 9-mile wind velocity. Upper part consists of a conical deflector top surrounded by a scientifically adjusted broad stormguard, making the Arex-Austor absolutely stormproof.

First Class Construction—Fabricated in one solid unit, no solder used, every joint rigidly riveted. Has no movable parts, no shutters, or louvers to break off, no ball bearings to clog, no meaningless fancy trimmings to impede ventilating action, nothing to get out of order. In short, a ventilator, simple in principle, durable in construction and sure to give year-in and year-out service without attention or repair. Made of galvanized iron, ingot or toncan metal, cold rolled copper; or in any special metal in size or gage. Prompt shipments from large factory stock.

120 Arex Austors on This Forge Shop

Arex-Austor (Original Siphonage)

Bottom View

Actual photograph. Note the extraordinary outlet for escape of air—greater than in any other ventilator. Observe the immense ventilating area—the deep, penetrating siphons—the triangular channels between the siphons. Well-balanced and mechanically perfect *throughout.*

Wide Adaptability—Thousands of installations have proven the Arex-Austor to be the ideal ventilator for mills, factories, foundries, warehouses, power plants, train sheds, railway cars, ships, theaters, hospitals, schools, etc. Can be installed on flat roofs, sawtooth roofs, slant roofs or on skylights and monitors.

Caution: The phenomenal success of Arex Ventilators has provoked petty imitations by name, design or principle. Beware of such infringements. Arex is the only trade-name under which our ventilator is sold.

Standard Specifications for Arex Ventilators—All roof ventilators to be Arex original siphonage ventilators as patented and manufactured by the AREX COMPANY, 333 North Michigan Avenue Building, Chicago, Ill.

Engineering Service — The first and foremost requirement is air exhaust capacity. Every factor that makes for or against results is of vital importance. The mere purchase of ventilating units does not in itself always solve a problem. That is why we, with over 20 years' experience and the record of 200,000 successful installations, recognizing our position and responsibility as the world's largest exclusive manufacturers in this field, surround our product with an engineering service aimed to assure maximum Arex efficiency.

This service consists of analyzing a problem, preparing sketch or blue print, making correct recommendation and giving valuable information and expert advice on this all-important subject of ventilation.

Economy Roof Ventilator

This ventilator is designed to meet the demand for a ventilator at lowest possible cost, yet capable of solving any ordinary ventilating problem.

Manufactured in attractive proportional design of solid sturdy construction. Absolutely guaranteed stormproof. Furnished with or without damper or base. Made in same sizes and gages as Arex-Austors. Workmanship and materials are of the same high quality.

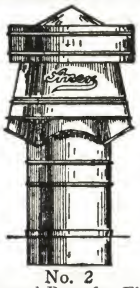
Prompt shipment from large stock always on hand.

Economy Roof Ventilator

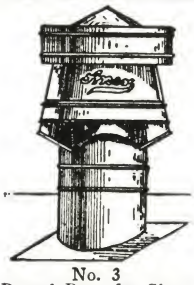
Manufacturing Facilities

Our modern plant and warehouse at South Gary, Ind., afford us unequalled advantages for manufacturing and shipping standardized ventilators in large quantities on short notice. Special bases and pipe connections made to order from submitted sketches.

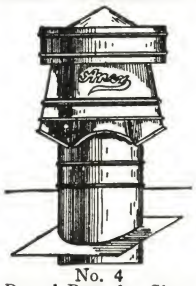
No. 1
Round Base for Flat Roof



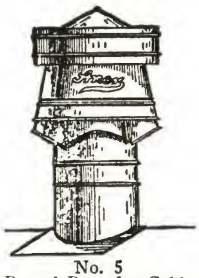
No. 2
Round Base for Flat Roof with Extension



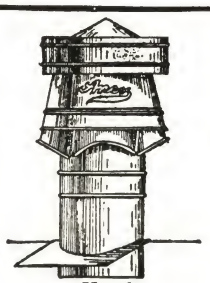
No. 3
Round Base for Slant Roof



No. 4
Round Base for Slant Roof with Extension

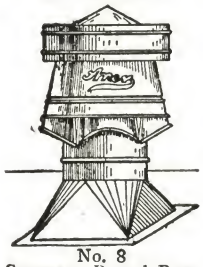


No. 5
Round Base for Gable Roof

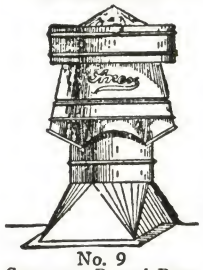


No. 6
Round Base for Gable Roof with Extension

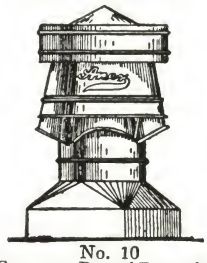
No. 7
Square to Round Base for Flat Roof



No. 8
Square to Round Base for Slant Roof



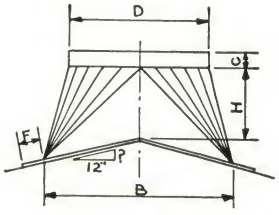
No. 9
Square to Round Base for Gable Roof

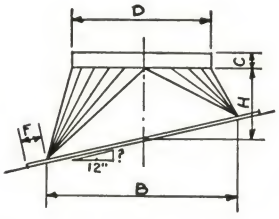


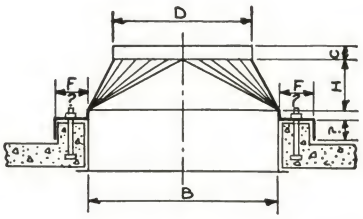
No. 10
Square to Round Base with Shoulder for Flat Roof

How to Order Arex Ventilators

Simply multiply cubical contents of room by number of air changes required per hour. The exhaust capacity table below will indicate the exact size of Arex-Austor required.







DATA, AREX-AUSTOR (ORIGINAL SIPHONAGE) VENTILATORS

Principal dimensions, in.			Exhaust per hour, cu. ft.	Gauge of ventilators		*Ship. wt., lb.
D	O.W.	O.H.		Galv. iron	Copper, oz.	
12	18	24	37,699	24	16	28
14	21	28	51,313	24	18	38
16	24	32	67,021	24	18	54
18	27	36	84,823	24	18	68
20	30	40	104,720	22	18	93
24	36	48	140,796	22	20	130
30	45	60	235,619	22	20	225
36	54	72	339,293	20	24	405
42	63	84	461,813	20	24	475
48	72	96	603,187	20	28	620
54	81	108	763,407	20	32	800
60	90	120	942,477	18-20	36	910
66	99	132	1,140,397	18	36	1170
72	108	144	1,357,167	16-18	44	1450
84	126	168	1,847,256	16	48	2225

*Weights given are for ventilators only.

Sectional View of Arex-Austor

DATA, AREX-AUSTOR (ORIGINAL SIPHONAGE) BASES

Dimensions of bases, in.				Gauge of bases	
B	H	F	C	Galv. iron	Copper oz.
15 x 15	12	4	3	24	16
17½x 17½	13	4	3	24	18
20 x 20	14	4	3	24	18
22½x 22½	15	4	3	24	18
25 x 25	16	4	3	22	18
30 x 30	18	4	3	22	20
37½x 37½	21	4	3	20	20
45 x 45	24	4	3	20	24
52½x 52½	27	5	4	20	24
60 x 60	30	5	4	18	28
67½x 67½	33	5	4	18	32
75 x 75	36	5	4	18	36
82½x 82½	39	6	5	16	36
90 x 90	42	6	5	16	44
105 x105	48	6	5	16	48

Shipping weight of bases is approximately one-third of that given for ventilators.

Arex-Austor Construction

Arex-Austors are made of Galv. Iron, Ingot or Toncan Metal, Cold-rolled Copper or any other special metal, in any size or gauge. The installations shown on this page are standard; special bases and pipe connections made to order—submit sketch.

Arex-Austors, 24-in. and upwards are provided with brass bolts connecting the frustum to the siphons. This permits installation in two halves and facilitates painting inside and outside at any time after they have been installed.

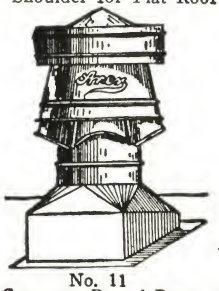
Condensation arrestors furnished at nominal cost when requested.

Unequalled facilities for turning out any quantity of any size ventilators on short notice. Prompt shipments from large stock always on hand.

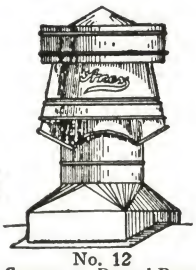
Our engineering department will solve your ventilating problems.

Expert advice without obligation. It will pay you to investigate.

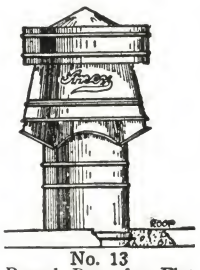
Thousands of installations without a single complaint.



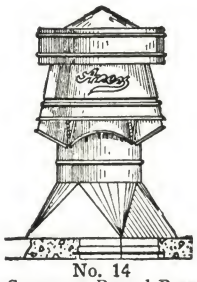
No. 11
Square to Round Base with Shoulder for Slant Roof



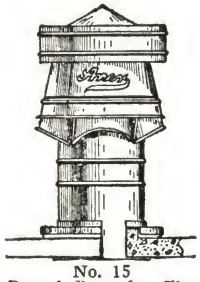
No. 12
Square to Round Base with Shoulder for Gable Roof



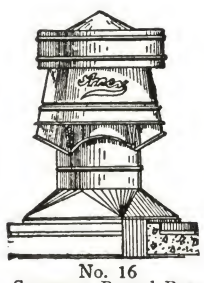
No. 13
Round Base for Flat Concrete Roof with Angle Iron Ring at Bottom



No. 14
Square to Round Base for Flat Concrete Roof with Angle Iron at Bottom



No. 15
Round Base for Flat Concrete Roof with Curb



No. 16
Square to Round Base for Flat Concrete Roof with Curb

ESTABLISHED 1890

THE BURT MANUFACTURING COMPANY

Manufacturers of Roof Ventilators

600 Main Street, AKRON, OHIO

BRANCH OFFICES

ATLANTA, GA., Conklin Tin Plate Metal Co.
BUFFALO, N. Y., M. J. Rodman, 454 Ellicott Square
CHARLOTTE, N. C., Metal Window Products Co.
CHICAGO, ILL., C. A. Pipenhagen, 170 West Chicago Avenue
DENVER, COLO., George P. Heinz & Co., 812 12th Street
DETROIT, MICH., B. E. Englander, 13948 Roselawn Avenue
FORT WAYNE, IND., Domestic Sales Co., 2016½ Fairfield Avenue
KANSAS CITY, MO., Natkin Engineering Co.
LOUISVILLE, KY., Sheet Metal Supply Co.
NEW HAVEN, CONN., Ernst Ohnell, Jr., 155 Filbert Street
NEW ORLEANS, LA., Woodward-Wight & Company, Ltd.
NEW YORK, N. Y., E. S. Bishop, 70 East 45th Street
PITTSBURGH, PA., Dravo Equipment Co., Dravo Building
ST. LOUIS, MO., F. A. Cammann Builders Service Co.
WASHINGTON, D. C., Fries, Beall & Sharpe
CANADA, Canadian Fairbanks-Morse Co., Ltd.

ALL OTHER PRINCIPAL CITIES

Burt Ventilator Types

Our over 30 years' experience in the roof ventilator business has proven beyond doubt that *no one type* of ventilator will adequately meet all conditions.

We have designed *various* types and are prepared to tell exactly which of these types of the proper size will handle any particular requirement. Some installations require revolving type ventilators, others require metal top sliding sleeve damper ventilators, still another will need a fire retarding type, and weave sheds will best be served by our double damper ventilator.

The new Burt Direct Connected Fan Ventilator gives positive action for bad conditions and natural action with fan shut off, so for many jobs it is the ideal installation.

Burt Ventilator
"A Size and Type for Every Purpose"

Conclusive tests have proven that this ventilator will exhaust its full capacity at all times regardless of the air conditions which reduce the effectiveness of ordinary gravity type ventilators.

Engineering Service

At Akron, we maintain an Engineering Department which will expeditiously co-operate with architects, engineers, contractors and others in selecting the proper types and sizes of ventilators to suit particular conditions and requirements.

Blue prints of our various types will be furnished on application. Send your specifications, rough pencil sketch or blue print to our engineers, and they will, without cost or obligation, send a detailed analysis of your situation, together with recommendations and quotations.

Materials Used

Burt Ventilators are made from only the highest grades of prime open hearth galvanized sheets, from 4 to 6 gauges heavier throughout than is customary in many makes of ventilators. Black iron is not used in the construction of Burt Ventilators. Among the other materials commonly used in their construction are copper, zinc, lead-clad sheets, toncan metal, armco iron, alcumite, aluminum and monel metal.

Burt Patented and Exclusive Features

Among the many features that account for the popularity of Burt Ventilators are the sliding sleeve damper, the spring clip, the notch rim, the condensation gutter and heavy construction.

The sliding sleeve damper efficiently regulates the flow of the air. The spring clip holds the damper rope in place after changing adjustment. The notch rim holds the glass in place on top of ventilator. The condensation gutter gathers the condensation and carries it off to the roof.

The above features are more fully described under the various ventilators of which they are a part.

Fig. 20A

Ventilator Capacities

Burt does not publish a table of capacities in SWEET'S because it would require several pages to give comprehensive data on the many types of Burt Ventilators. Each building has its specific ventilating problem and it is practically impossible to select the proper size and type of ventilator unless the table of capacities takes into consideration the many variables which affect the amount of air exhausted.

To be comprehensive a table of capacities should include all the variables such as wind velocities, temperature differences, heights above intake and humidities. These variables are essential to the completeness of any table on capacities, and yet a table which would include all of these would only be useful for comparative purposes because the capacity of the ventilator is also dependent upon its specific location on the building.

Burt Engineers have made reliable tests on their ventilators and are prepared to furnish complete and comprehensive explanations to any one interested. The Bureau of Standards at Washington, a reliable authority, has given reports which indicate that the performance of all types of Burt Ventilators is unusually high.

As a matter of fact, the best way to select the proper size and type ventilators for your building, provided your engineers are not familiar with the situation, is to submit a rough sketch of your building and let our engineers place the ventilators for you.

Burt Guarantee

We guarantee Burt Ventilators to be free from defects in workmanship and material, and will replace at any time free of charge, f.o.b. Akron, any Burt Ventilator proven defective.

Burt Sliding Sleeve Damper Ventilator

Marketed for over thirty years, this ventilator is not an experiment—it is used by many of the largest industrial plants in the United States.

These ventilators may be had with either metal tops or glass tops. The metal top ventilator serves as a ventilator only, while the glass top serves as a *combination skylight and ventilator.*

Exclusive Features—(1) The patented damper in this ventilator consists of a sliding (telescopic) sleeve, which is operated from below by means of a cord or chain running over a rust resisting pulley. Each ventilator is equipped with a patented clip so that damper can be set in any position and held there without fastening the cord to a nail, hook or post. As the sliding sleeve damper is not affected by air currents, *it maintains its position* and requires no attention. This construction is a marked improvement over the flat damper type.

(2) The sliding sleeve damper has no flat surface, therefore, it does not collect dust or dirt to be shaken off into the building.

(3) The air shaft is open and unobstructed at all times. Air currents are not deflected downward, and it is possible to adequately ventilate with a smaller number of Burt Ventilators than most competing types.

(4) The sliding sleeve damper makes our glass top ventilator an ideal skylight, as the light is never obstructed.

(5) The glass top ventilator is equipped with heavy ribbed wire glass held in place by a patented notched rim, and made absolutely watertight by means of waterproof cement. Glass can be replaced quickly by merely removing the notched rim, without removing ventilator from the roof.

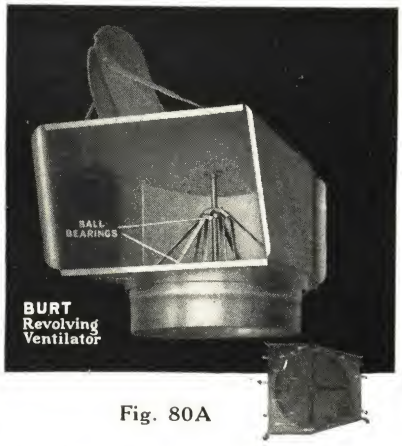


Fig. 80A

(6) Our patented trough or lip is placed below the glass top, into which runs any condensation which may gather on the glass. A similar trough on the lower part of the base collects all condensation forming on the air shaft.

Dimensions and Weights—See following page.

How to Specify—See specifications on the following page.

New Burt High Efficiency Fire Retarding Cone Damper Ventilator

In this type of ventilator, an inverted cone is used as a damper, which is operated from the floor (moved up and down) by a copper chain running over a rust-resisting pulley as shown.

The damper of this ventilator is furnished with fusible link which insures it automatically closing in case of fire. When the damper is thus equipped this ventilator is listed by the Underwriters' Laboratories, Inc.

One of the very latest improvements on the Cone Damper Ventilator is the patented Spring Clip which replaces the elongated slot formerly used in Cone Damper Ventilators. When the fire retarding feature is desired, the fusible link is inserted in the damper chain and the patented Spring Clip that is furnished should be placed in the air shafting below the ventilator or down below in the room. If the fire retarding feature is not desired, the patented clip is bolted to the cone damper itself.

Fig. 50A

The spring clip and fusible link, of course, obviate the necessity of tying the chain to a post, nail or hook in the building itself.

The construction of this ventilator embodies all the essential features of construction recommended by the American Society of Heating and Ventilating Engineers.

The patented raising and lowering device is simple and positive in action, and is guaranteed not to stick or bind. The air shaft is open and unobstructed at all times—there are no braces of any kind in the air shaft or neck.

The inverted cone damper permits easy flow of air outward—there are no sharp turns or obstructions, and no air pockets.

The *extra wide wind band* makes this ventilator absolutely stormproof and creates a larger low pressure area, and a better exhaust. The location of the louvers, top and wind band have been scientifically worked out so that regardless of the direction of the wind, it can not pass through the ventilator head and get into the building—guaranteed against back-drafts.

Exhaust area is larger than cross-sectional area of pipe, which assures guaranteed exhaust capacity.

Dimensions and Weights—See following page.

How to Specify—See specifications on the following page.

Burt Revolving Ventilator

A neat and well constructed ventilator of the revolving type that has been perfected to the highest point of efficiency.

Its design and open back construction cause the air currents to pass not only over the top and sides, but directly through it, thus creating a partial vacuum in front of the air shaft, which greatly increases its capacity or pulling power. This construction also holds the ventilator steady with the wind.

Each Burt Ventilator is erected and tested in our factory before shipment, insuring perfect balance.

This ventilator is equipped with two sets of high grade steel ball bearings, Timken roller bearings or other bearings specified—it is positively guaranteed not to stick or bind.

There are no louvers in the revolving head, consequently maximum efficiency is obtained. If bases are furnished by us, we will install flat dampers without charge. When specified, we furnish dampers of the fire retarding type which close automatically in case of fire.

This ventilator has proven a success under a wide range of conditions and thousands are now in use.

Dimensions and Weights—See following page.

How to Specify—See specifications on the following page.

Burt Fan Ventilator

This ventilator is designed for ventilating foundries, steel mills, laundries, motor rooms, auditoriums or any other building where a definite number of air changes are required, and where ordinary gravity ventilators are inadequate because they must depend upon air movements and other outside sources for their effectiveness.

Each size of Burt Fan Ventilators has a definite capacity and is guaranteed to exhaust that amount of fumes, steam or bad air from a building at all times.

It includes all the advantages of a high grade gravity ventilator, and has the added advantage of the powerful motor driven exhaust fan which gives it capacities that are from five to ten times greater than those of ordinary ventilators. The fact that a few fan ventilators will do the same work that would require several gravity ventilators cuts down the labor cost in erecting and eliminates the necessity of cutting the roof of the building full of holes.

The Burt Fan Ventilator is quiet in operation, and the specially built motor is fully enclosed to prevent it from deterioration on account of fumes or steam coming in contact with the windings. It has a very low power consumption and, when conditions within the building are normal, can be shut down without interfering with the efficient operation of the ventilator as a gravity type.

Fig. 90A

Sizes—Standard sizes are from 14 to 48 in., inclusive, and can be furnished in practically any electrical characteristics, either alternating or direct current.

Motors—Standard motor speeds are 670, 860, 1140 and 1725 r.p.m. Fan ventilators can also be furnished with variable speed or explosionproof motors when specified.

How to Specify—See specifications on the following page.

Burt Rectangular Ventilators

Made in all sizes, of any metal desired, metal or glass tops, and equipped with Burt patented sliding sleeve damper described as used on metal top. Suitable for public buildings, foundries, schoolhouses, etc.

Can be adapted to any size or shape of roof opening.

How to Specify—See specifications on following page.

Burt Double Damper Ventilator

Designed for weave sheds and places where condensation forming on air shaft and cowl must be prevented from entering the building. Adopted by many of the largest textile mills in the United States.

Fig. 26A. Burt Double Damper Ventilator

The condensation trough in the air shaft of the Burt Double Damper Ventilator collects most of the moisture and passes it out on the roof through the condensation drain. When condensation is severe, the trough-shaped lower damper acts as a drip pan and collects the moisture, the latter being quickly evaporated. The lower drip pan (below bottom damper) is a safety device that collects any overflow from the bottom damper. It can be piped to pass water out on the roof.

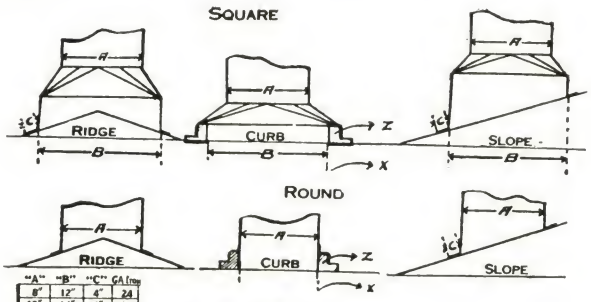
The two dampers are operated simultaneously by means of a cord from below which is held firmly by a patented clip fastened to roof. Made in all sizes.

How to Specify—See specifications below.

Ventilator Bases

Ventilator bases are made to conform to the pitch of the roof, either round or square. Square bases are recommended for maximum efficiency, capacity and rigidity. Extra heavy—of the same gauge metal as the ventilator itself.

Burt Bases have the following features: condensation trough in every base, 4-in. flashing or more on every base to insure stormproofness, four different types (flat roof, slope, curb or ridge) and every base made separately for each particular job.



"A"	"B"	"C"	GA Iron
8"	12"	4"	24
10"	14"	4"	24
12"	16"	4"	22
14"	18"	4"	22
16"	20"	4"	22
18"	23"	4"	20
20"	26"	5"	20
24"	30"	5"	20
30"	36"	5"	18
36"	42"	6"	18
40"	46"	6"	18
42"	48"	6"	18
48"	54"	6"	18
54"	60"	6"	18
60"	66"	6"	18
66"	72"	6"	18
72"	78"	6"	18

x EXTRA AIRSHAFT OR COLLAR CAN BE PLACED INSIDE CURB IF DESIRED.

z ALWAYS STATE THICKNESS OF CURB.

ROUND BASES—DIM. A & B SAME.

WHEN ORDERING BASES ALWAYS STATE TYPE AND PITCH OF ROOF AND WHETHER FOR SLOPE OR RIDGE.

Burt Ventilator Bases

DIMENSIONS AND WEIGHTS OF BURT VENTILATORS

Size or diam. neck, in.	Area of neck, sq. in.	Gauge of steel	Sliding Sleeve Damper						Cone Damper				Revolving				
			Diam. wind band, in.	Height without base		Average net weight, lbs.		Average crated weight, lbs.									
				Metal top	Glass top	Metal top	Glass top *	Metal top	Glass top **	Diam. wind band, in.	Height without base, in.	Average net weight, lbs.	Average crated weight, lbs.	Width mouth opening, in.	Height mouth opening, in.	Length of head, in.	Average net weight, lbs.	Av'age crated weight, lbs.
8	50.22	22	15	13¼	11¼	10	8	18	22	15	15	15	23	12	7½	15	18	30
10	78.54	22	18	15½	12½	12	10	20	24	18	15½	18	26	16	9½	19	20	35
12	113.10	22	22	17	14	15	13	25	30	22	16	27	37	19	12	22½	30	50
14	153.94	22	24	17½	15	20	18	30	35	24	17	30	40	21	14	26	35	65
16	201.06	22	26	19	15½	24	21	40	46	26	19	37	52	24½	14½	30	42	75
18	254.44	20	29	21	16	28	25	48	55	29	21	43	63	28½	15	34	50	100
20	314.19	20	32	23	18	33	30	60	70	32	22	50	75	29½	16½	36	60	125
24	452.39	20	38	26	22	53	50	83	85	38	27	60	90	33½	18	40	90	160
30	706.85	18	46	30	24	94	90	146	155	46	33½	112	170	41	24	47½	140	220
36	1017.88	18	54	36	27	145	140	205	245	54	39	156	220	50	24½	56	190	310
40	1256.00	18	64	40	33	180	171	245	290	64	43½	215	310	48½	25½	63½	250	350
42	1386.00	18	68	42	34	200	187	275	300	68	45	235	330	54½	26½	65	280	470
48	1809.00	18	78	46	36	260	249	350	340	78	48	300	400	61	36	76½	390	650
54	2390.00	18	86	51	40	350	330	455	450	86	57	390	500	67	44	98	575	750
60	2827.00	16	94	54	43	430	405	550	545	94	58	480	590	74	52	98	650	980
66	3456.00	16	102	55	46	500	470	635	625	102	62½	560	690	79	52	107	750	1120
72	4071.00	16	110	66	51	625	585	775	760	110	69	731	874	.....	.....	.....	.....	.....

*Net weight does not include glass.
**Weight of glass included in gross weight.

How to Specify Burt Ventilators

Metal Top Ventilator—(1) Furnish and install on roof, where shown on drawings, Burt Metal Top Ventilators, as manufactured by The Burt Manufacturing Company, Akron, Ohio.

(2) Ventilators shall be of diameters shown and shall be constructed of prime open hearth galvanized steel sheets of The Burt Manufacturing Company's standard gauge, strongly braced with galvanized steel bands and properly riveted.

(3) Ventilators shall be provided with sliding sleeve dampers, operating by chains or cords over rust resisting pulleys and equipped with clips so that they can be set in any position and held permanently. When sleeve is at its highest point it shall completely close ventilator.

(4) Ventilators shall be guaranteed against defects in workmanship and material by the manufacturer, who shall agree to replace or repair without charge, any ventilator proving so defective.

(5) Ventilators shall be thoroughly flashed to the roof and be made absolutely watertight.

Glass Top Ventilator—(6) Furnish and install on roof, where shown on drawings, Burt Glass Top Ventilators, as manufactured by The Burt Manufacturing Company, Akron, Ohio.

(Insert paragraph 2 here.)

(7) Ventilators shall be provided with notched rims as manufactured by The Burt Manufacturing Company, Akron, Ohio, for holding glass in place so that same can be replaced if necessary without removing ventilators from roof.

(8) Ventilators shall have troughs or lips placed below glass so as to conduct any condensation or moisture that may form to the roof.

(Insert paragraphs 3, 4 and 5 here.)

Double Damper Ventilator for Weaving Rooms—(9) Furnish ventilators for weaving rooms, as shown on drawings, to be provided with double dampers as manufactured by The Burt Manufacturing Company, Akron, Ohio.

(Insert paragraphs 2, 4 and 5 here.)

Fan Ventilators—(10) Ventilators in ....., as shown on drawings, shall be Burt Direct Connected Fan Ventilators, provided with 4-blade fan and fully enclosed motor. Motor supports are to be fitted into barrel of ventilator by means of composition mountings. Motor to be standard horsepower and speed as furnished by The Burt Manufacturing Company, Akron, Ohio, unless otherwise specified.

(11) Fan ventilators shall be provided with cone dampers, operated by cord or chain and rust resisting pulleys with fusible links which will cause dampers to drop and completely close in case of fire.

(Insert paragraphs 2, 4 and 5 here.)

Sliding Cone Damper Ventilators—(12) Furnish and install on roof, where shown on drawings, Burt Fire Retarding Sliding Cone Damper Ventilators as manufactured by The Burt Manufacturing Company, Akron, Ohio.

(13) These ventilators shall pass the approval of the Underwriters Association of America.

(13a) Ventilator is to have an extra wide wind band as per The Burt Manufacturing Company's standard for this type. Wind band to be located so as to prevent any entrance of outside wind into the ventilator head, whether up from a sloping roof or any other angle.

(Insert paragraph No. 11, but substitute "cone damper regulators" in place of fan. Follow with paragraphs 2, 4 and 5.)

Ball Bearing Revolving Ventilators—(14) Furnish and install on roof, where shown on drawings, Burt Ball Bearing Revolving Ventilators as manufactured by The Burt Manufacturing Company, Akron, Ohio.

(15) Ventilators shall be equipped with two sets of hardened steel ball bearings, and shall have open back construction so as to hold ventilators steady with the wind.

(Insert paragraphs 2, 4 and 5 here.)

Note: In order to satisfy people who are not convinced as to our type of bearing, we are prepared to install at no additional charge bronze ball bearings in place of the hardened steel bearings. We do not recommend nor guarantee this type, but will furnish them if specified.

Square and Rectangular Ventilators—(16) Furnish and install on roof, where shown on drawings, Burt Square or Rectangular Ventilators as manufactured by The Burt Manufacturing Company, Akron, Ohio. These ventilators shall be equipped with sliding sleeve dampers [common flat dampers] and with glass [metal] top.

(Insert paragraphs 2, 4 and 5 here.)

Note: If ventilators are to be constructed from copper, zinc, lead clad sheets or any other metal, insert these words in proper space above.

GLOBE VENTILATOR COMPANY

Manufacturers of Roof Ventilators

TROY, N. Y.

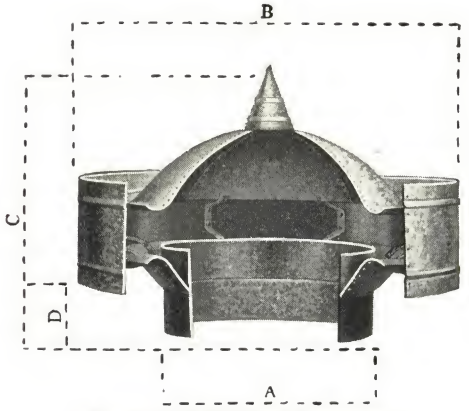
Products

"GLOBE" VENTILATING DEVICES:
Roof Ventilators.
Barn Ventilators.
Chimney Caps.
Car Ventilators.

"Globe" Ventilator Construction

"Globe" ventilators are made of heavy gauges open hearth galvanized copper-bearing steel (see table below) and are rigidly braced with extra heavy steel bars. In sizes 18 in. and above, the tops and bottoms are made in a number of sections which overlap and are riveted, making them double at each of these points and exceptionally strong ventilators. Their simple and sturdy construction guarantees long life.

They can also be furnished in Armco iron, Toncan metal and copper and with glass tops when light as well as ventilation is required.



Section of "Globe" Ventilator

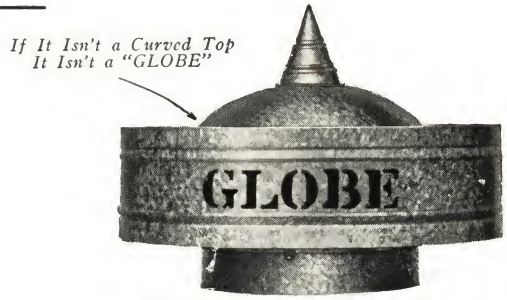
A—Diameter of pipe
B—Diameter of band
C—Height of ventilator
D—Distance from bottom of band to bottom of ventilator

DIMENSIONS, GAUGES OF MATERIAL, AND LIST PRICES OF "GLOBE" VENTILATORS

Principal dimensions, inches				Gauge of iron	Wt. of copper, ounces	Area, sq. in.	*Price list subject to liberal discount
A	B	C	D				
6	11	9	1½	26	18	28.27	$ 3.40
8	14	11	1¾	26	18	50.26	4.65
10	17	13	2	24	18	78.54	5.75
12	19	14	2	24	18	113.10	6.75
14	25	18	3	20 & 24	18	153.94	13.00
16	28	20	3	20 & 24	18	201.06	20.00
18	32	23	4	20 & 24	20 & 18	254.47	27.00
20	36	25	4½	20 & 24	20 & 18	314.16	33.00
24	43	30	6	20 & 22	24 & 20	452.39	40.00
30	52	35	6	18 & 22	24	706.8	65.00
36	66	50	8	18 & 20	24	1017.9	120.00
40	74	57	9	18 & 20	24	1256.6	180.00
48	84	64	10	18 & 20	24 & 28	1809.6	240.00
54	92	67	10	18 & 20	28	2290.2	300.00
60	99	70	10	18 & 20	28	2827.4	360.00

The heavier weights of material are placed in bands and collars of ventilators.
Fire-retardant dampers furnished when desired.
*Galvanized iron ventilators only. Prices of copper ventilators on request.

The design of the "Globe" ventilator, with its curved inner and outer surfaces, is such as to induce a rapid movement of the air outward, at the same time offering a minimum of resistance to the flow. Every inch of its opening is effective in creating efficient, positive ventilation. It utilizes all wind currents and works without wind by natural suction.



Metal Top "Globe" Ventilator

Uses—The "Globe" ventilator has been in operation for many years on practically every known type and class of building.

It is removing smoke, steam, fumes, gases, dust, etc., from factories, foundries, steel mills and other industrial buildings, and providing for fresh air in school buildings, churches, theaters, barns, etc. It has back of it years of *proved efficiency.*

Information and Estimates—Prices, blue prints, capacities, working model and complete information will be furnished on request.

Shipment—"Globe" ventilators are carried in stock in the leading cities, and immediate shipment can be made from our factory.

"Globe" Ventilator Bases

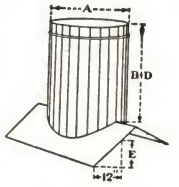
Ventilator bases, either round or square, are made to fit accurately the roof pitch, and have 4-in. flanges.

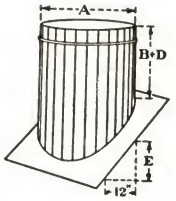
Different types of bases, dimensions, gauges of materials used and average shipping weights are shown below. Square bases are recommended for maximum capacity and strength.

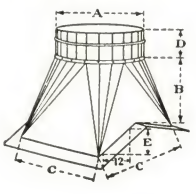
When inquiring or ordering, please furnish pitch of roof (E), state whether for ridge or slope and whether round or square bases are desired. When ordering bases to fit over concrete curbs, give size of opening and curb.

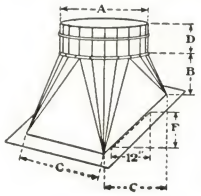
GLOBE VENTILATOR BASES

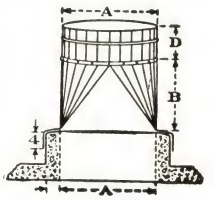
A in.	B in.	C in.	D in.	E in.	Gauge iron	Wt. copper, oz.	Aver. crated wt., lb.
10	10	12	6	State pitch of roof in rise to 12 in. run and whether for slope or ridge	24	20	20
12	10	14	6		24	20	25
14	10	16	6		24	20	30
16	10	18	8		22	20	35
18	10	22	8		22	20	40
20	12	24	8		22	20	45
24	12	30	10		20	24	55
30	12	36	10		20	28	65
36	14	42	10		20	28	85
40	14	48	10		18	32	125
42	14	52	10		18	32	140
48	16	56	10		18	32	160
54	16	64	12		18	32	200
60	18	72	12		18	32	225











W. F. HIRSCHMAN CO., INC.

Manufacturers of Roof Ventilators

BUFFALO, N. Y.

FACTORY: LE ROY, N. Y.

BALTIMORE, MD., 330 St. Paul Place
BOSTON, MASS., 37 Pearl Street
CHICAGO, ILL., 2539 East 73rd Street
DETROIT, MICH., 97 West Warren Avenue
NEW YORK, N. Y., 205 East 42nd Street
PHILADELPHIA, PA., 1338 Spring Garden Street

Products

EFFICO ROTARY BALL BEARING VENTILATOR HEADS.
EFFICO INTERNAL LOUVER UNIT ROOF VENTILATORS.
EFFICO WIND-ELECTRIC FULL AUTOMATIC VENTILATORS.
S E VENTILATOR EXHAUST HEADS.
F FAN VENTILATORS, non-automatic (electric).
L U VENTILATORS.
EFFICO STANDARDIZED ROOF VENTILATOR BASES.
HIRSCHMAN ELECTRIC DAMPER CONTROL.

Also Firma (Bonded) Ventilators; Le Roy Internal Louver Unit Roof Ventilators and Effico Skylight Ventilator Unit (Puttyless).

Permanent Exhibit

Permanent exhibit of our complete line at all offices, also stock carried at New York, Buffalo, Detroit and Philadelphia. Visitors also are welcome at our factory at LeRoy, N. Y. (see thousands of ventilators in course of production).

Effico Fan Equipped Rotary Ball Bearing Roof Ventilators

Construction and Principle of Operation—The Effico rotating cowl exterior is covered by wind propelled blades; interior by suction blades. There are no moving parts. Effico shaft rotates on ball bearings, fitted with clock precision in solidly enclosed dusttight and oiltight housings, and is flooded in inches of non-freezing oil (furnished by us); no oiling required for years (proven), but we oil flood them as an extra precaution, and the Effico is absolutely noiseless.

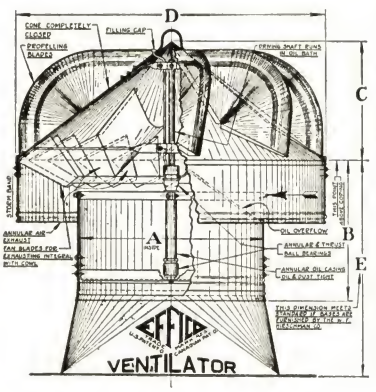
Great Air Volume Exhaust at Low Wind—All Efficos will draw considerable air at a 1-mile breeze (an apparent calm) without stack or heat assistance. The 30-in. size will rotate (standing start) at .7-oz. pressure, ½-mile breeze. Cowl outlet is over 50% larger than its stack area, which is ample, as no wind enters ventilator to gain the so-called siphonage effect. Suction fan is same size as rotating cowl (note dimension chart). Thus each Effico is equipped with fan over 50% greater in diameter than its stack area. Fan pulls air up stack at even the slowest turning movement and wind blowing across the outlet adds to its efficiency.

Percentage of Constancy—With United States Weather Bureau reports as a basis, and their findings that the wind at line of ventilators (over roof) is three miles slower than the tower records, shows the Effico Wind Driven Head during July and August to be 96% constant in New York City, Philadelphia, Boston, Buffalo, Cleveland, Detroit, Galveston, Kansas City, San Francisco, Chicago, Jacksonville, Florida; 90% constant in Columbus, Ohio, Toronto, Louisville, St. Louis; 80% constant in New Orleans, Milwaukee, Cincinnati and Baltimore.

Symmetry—The Effico has artistic lines and pleasing appearance. Lowest in height of rotary ventilators by over 50% average. Note dimension chart.

Weatherproof—The Effico Rotary Ball Bearing Ventilator operates during all kinds of weather—rain, ice, snow or sleet does not affect or hamper its exhausting. No drip pans or bird screens are needed.

Cost—Effico Ventilators exhaust more air per-dollar-cost of installation. The wind (only) driven heads exhaust greater volumes and during lower winds, thus a greater capacity within a given period. Effico Wind-Electrics, of course, are 100% constant, see second page following.



Corrosion Protection—All interior fabrication members after forming and punching and bolts and nuts are rustproofed. For copper ventilators, bolts and rivets are solid brass and copper. Only carefully selected prime sheets and materials are used throughout, whether of galvanized, copper, or other special metals.

Effico Rotary Ball Bearing Ventilator Installation

EFFICO STANDARDIZED VENTILATORS

Dimensions in inches					Galvanized steel			Copper, oz.		Code
					Gauge		Net weight, lb.			
A	B	C	D	E	Cowl	Neck and base		Cowl	Neck and base	
6	9	5	13	.....	26	26	10	14	14	sheck
10	9	5	16	.....	26	26	18	14	14	sachem
12	11	8	21¾	23	24	24	25	14	14	scene
18	11½	10	28½	24	24	24	38	16	16	saturn
24	16	14	42	26	24	22	95	16	18	shake
30	22	14	52	32	22	20	140	16	20	sank
36	24	18	62	34	22	18	180	18	24	sergeant
42	33	22	68	45	22	18	300	18	24	serpent
48	34	24	74	45	22	18	370	18	24	serve
54	35	24	86	46	22	18	525	20	24	sham
60	37	24	98	49	20	18	650	20	24	shawl
66	43	30	103½	61	20	18	700	20	32	sunk
72	50	30	114	68	20	18	750	20	32	shop
84	54	36	130	72	18	16	900	24	32	slave
96	54	45	153	72	18	16	1025	24	32	shekel

CAPACITIES OF EFFICO ROTARY BALL BEARING VENTILATORS

Guaranteed and Conservative

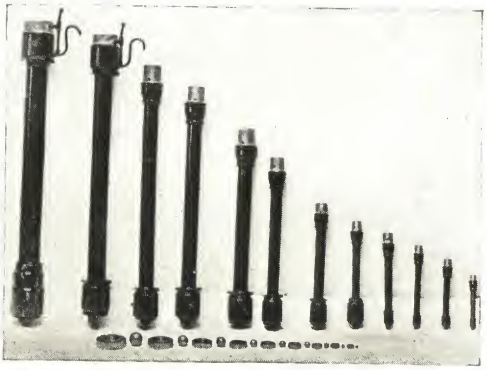
Cubic Feet of Air Exhausted Per Minute

Wind velocity, miles per hour	Temperature difference in degrees Fahrenheit in building and outside											
	0	10	20	30	0	10	20	30	0	10	20	30
	12-in. Ventilator				**18-in. Ventilator**				**24-in. Ventilator**			
5	350	440	515	560	600	850	950	1040	1020	1600	1780	1900
10	430	525	600	625	910	1050	1200	1300	1490	1900	2100	2300
	30-in. Ventilator				**36-in. Ventilator**				**42-in. Ventilator**			
5	1560	2300	2690	2900	2300	3400	3810	4100	3150	4500	5010	5500
10	2300	3210	3490	3600	3250	4200	4720	5050	4390	5700	6300	6800
	48-in. Ventilator				**54-in. Ventilator**				**60-in. Ventilator**			
5	4000	5900	6700	7400	5100	7300	8450	9500	6500	9300	10600	11900
10	5900	7900	8900	9050	7850	9900	11000	11500	9200	12500	14000	14500
	72-in. Ventilator				**84-in. Ventilator**				**96-in. Ventilator**			
5	9800	13500	14600	16000	12500	18000	21000	23000	16000	22500	27000	29000
10	13000	17000	19000	20000	18000	24000	27000	28000	22800	30000	33500	35500

Suggested Specifications—The roof ventilators to be of the sizes as shown in plans and are to be constructed of [toncan iron] [copper]. They shall be the Effico Rotary Ball Bearing Ventilators as manufactured by W. F. HIRSCHMAN CO., INC., Buffalo, N. Y. Bases to be [square type] [round type] of same gauge metal as ventilator neck. Ventilator stack to be sufficiently high to elevate the ventilator propelling blades above coping.

Electric Damper Control

Where required, our Hirschman electric remote control damper device can be supplied with any Hirschman ventilator.



Effico Oil, Dust and Acid Proof Bearing Housings

TWO-IN-ONE VENTILATORS

Effico Internal Louver Unit Ventilators

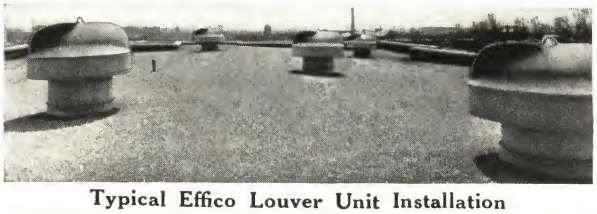
The Effico Internal Louver Unit comprises the Effico Rotary Ball Bearing Ventilator Head constructed with a specially short base or neck. In this base is built a circular multiple blade louver damper. The damper is carefully balanced and heavily constructed. The blades lap and are fitted in a circular frame. It is adaptable for manual control, but is intended for a thermostatic control system. The roof base is very low, is part of this unit, and is supplied with either the square or round base.

The roof base and the ventilator head are connected by means of angle iron companion rings which give solidity and facilitate the taking down of the ventilator when required. Each ventilator neck has also a tight fitting door to give free access to the louvers and to the operating motor. The operating motor is suspended underneath the damper. The object of the specially low base and the low roof base is to make the entire unit as low to the roof as possible.

Effico Louver Dampers—Made of stretcher leveled sheet steel. Hirschman Electric Damper Control or pneumatic damper motor is supplied and installed with these units unless not desired. Note specifications blow.

Effico Louver Unit—*Low height.* The Effico Louver Unit sets very low. Note dimensions in table at right.

Height Above Coping—Louver Unit "C" dimension should be above coping.



Typical Effico Louver Unit Installation

Effico Rotary Ball Bearing Ventilator Head—The Effico Rotary Ball Bearing Ventilator Head is already lower in height by 50% than usual ventilators of this type. By using the construction as outlined above, the entire unit is brought as *low* to the roof as is permissible to still allow the air free exhausting and to maintain the outlets above the snow line. By adopting the circular multiple louvers, of which we are the inventors, we can standardize on sizes and build the round louver for considerably less than the square or rectangular styles, many of which we have built in past years.

By installing the louvers in the neck of the ventilator in our shops, we not only give a perfect fit, but also eliminate all indefiniteness as to the correct location and size of the damper and cut the installing cost to one-quarter. It is also easier to install the operating motor and makes it more accessible. The size of the damper is the full size of the stack, and yet is about 40% smaller in area than those heretofore used in the square or rectangular louver, again reducing the cost considerably. By supplying the contractor with the complete unit the builder is assured of a well designed, uniform and complete apparatus.

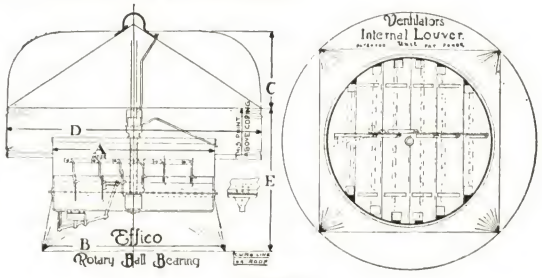
Heretofore, the contractor purchased the ventilator from one manufacturer, probably built the roof base himself, and purchased the dampers elsewhere, or even the dampers were supplied and installed by another contractor. This added materially to the cost.

Suggested Specifications—The roof ventilators shall be of the sizes as shown in plans, [square base] [round base] style, to be made of [toncan iron] [copper]. The pneumatic (electric) damper motor to be supplied with these units. These ventilators shall be the Effico Internal Louver Unit Ventilators as manufactured by the W. F. HIRSCHMAN CO., INC., Buffalo, N. Y.

EFFICO LOUVER UNIT SIZES AND DIMENSIONS

Dimensions, inches					Galvanized			Copper, oz.		Code for telegraphy
					Gauge		Net weight, lb.			
A	B	C	D	E	Cowl	Base		Cowl	Base	
18	20	10	28½	23	24	24	90	16	18	vale
24	30	14	40	30	22	22	140	18	20	valet
30	36	14	50	32	22	20	190	20	20	vive
36	42	18	60	32	22	18	225	24	24	varve
42	48	22	68	43	22	18	350	24	24	vetch
48	54	24	76	43	22	18	400	24	24	vax
54	60	24	86	43	22	18	600	24	24	vaid
60	66	24	98	43	20	18	710	24	24	valor
66	72	30	103½	49	20	18	800	24	24	vamp
72	80	30	114	54	20	18	880	24	32	vane
84	92	36	130	54	18	16	1050	24	32	vang
96	116	45	153	54	18	16	1200	24	32	van

For round bases, "E" dimension remains the same.
For capacities note preceding page.



Patented

Effico Rotary Ball Bearing Ventilator—Internal Louver

Open Closed

Multiple Circular Louver Damper in Neck of Ventilator

As a Wind-Electric

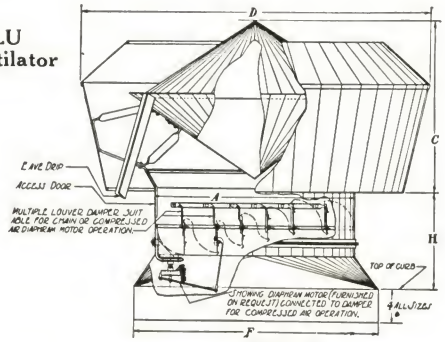
The Effico Louver Unit Ventilator can be furnished with automatically operating electric exhaust motor. Note next page.

L U Ventilator

A unit ventilator containing the circular multiple damper like the Effico shown above. This stationary head is described on the second following page. This head *only* is sold as the S E Head.

Cost—The L U Ventilator is low in cost and is well made. Note specifications on second page following. For those preferring a stationary ventilator we recommend this high class exhauster.

LU Ventilator



Patented

For dimension chart, see second page following.

Effico Wind-Electric Ventilator, Full Automatic

Principle of Operation—This is the regular Effico wind driven head equipped with an auxiliary electrically-operated fan.

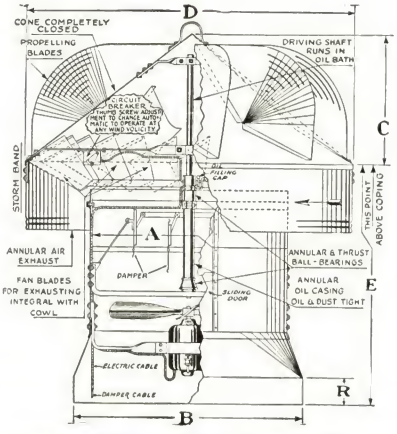
When the wind is blowing sufficiently to drive the wind turbine, and remove the desired amount of air from the building being ventilated, the electric motor is still. Instantly, when the wind turbine moves below previously-determined revolutions, the electric motor carries the load, starting automatically, and runs until the wind again drives the wind turbine.

The *electric motor is cut off and on automatically.* The throat is slightly enlarged to allow for the motor.

Wind-Electric Power—Wind or no wind, this ventilator will exhaust a previously determined volume of air.

When in Use—For installations which require a definite minimum exhaust at all times or which may require an unusually heavy exhaust at intermittent periods. For exceedingly difficult installations, where Effico Ventilator Heads (wind driven only) due to location are not practical, the Effico Wind-Electric Ventilator will successfully ventilate any type of building.

Special Advantages—Besides the regular automatic operation the motor may also be so connected as to give a maximum exhaust capacity (running full speed) by manual control, thus allowing a great volume of air to be exhausted at will.



Details of Effico Wind-Electric Rotary Ball Bearing Ventilator
Patented

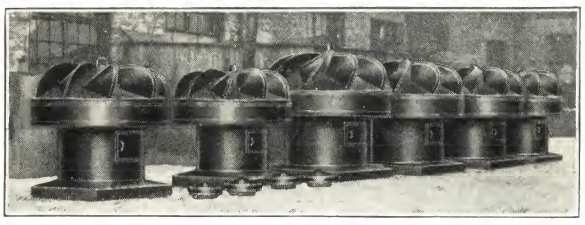
Adaptability—Adjustable to exhaust various quantities of air within the limits of given sizes and is regularly supplied at capacities equivalent to a 5-mile wind and 10° temperature difference rating.

If the wind drops below 5 miles per hour or temperature below 10° difference, the Effico Wind-Electric Ventilator maintains its regular exhaust capacity.

Any other capacity can be supplied and the ventilator is adjustable to any constant capacity after installation.

Power Consumption—1/30 hp. to ½ hp. Effico Wind-Electric Ventilators require very little power.

Static Pressure—Motor and fan can be supplied to pull against ⅛-in. static resistance by the employment of motor only, or motor and wind turbine. This will have no deteriorating effect on using apparatus for regular ventilating purposes.



Battery of Effico Wind-Electric Full Automatic Ventilators

This battery of three 48-in., two 42-in., and one 36-in. Effico Wind-Electric Full Automatic Ventilators was photographed before installing. Note size by contrast with the background. They have a combined exhausting capacity of 31,500 c.f.m., regardless of wind velocity or temperature difference and can be adjusted to a 25% increase if necessary. Combined motors have only 2 hp. consumption. Now installed in a Massachusetts school

Selecting a Ventilator—When in need of a ventilating apparatus it is best to choose one that does not depend upon mechanical exhausting *only,* for a good roof ventilator is acknowledged to be *superior* to an arrangement that closes entirely unless the motor is running.

Self-contained United Construction—The Effico Wind-Electric Ventilator comprises the wind turbine, the same type head as described on previous pages, electric motor, fan, and roof base which form a complete exhaust unit.

The motor is furnished and installed by us in the ventilator.

Dampers—Effico Wind-Electric Ventilators are supplied with tight fitting, carefully balanced dampers. The larger sizes are furnished with Effico Multiple Circulator Louver Dampers.

See preceding page.

All dampers are operatable by chain, electrically, or by compressed air in connection with thermostatic controlled heating and ventilating systems.

Pneumatic or electric damper control is supplied and installed in the ventilator if desired.

Effico Low Height—All Effico Ventilators are lower in height than usual ventilators by almost 50%. "C" dimension should be above coping.

Note dimensions below.

Finish—Handsomely painted in gray or any desired color if made of galvanized sheets.

Specifications—The roof ventilators to exhaust from (....) to be the Effico Wind-Electric Ventilators (full automatic) as made by the W. F. Hirschman Co., Inc., Buffalo, N. Y., the sizes to be as shown on the prints. They shall be of [toncan iron] [copper]. The current for the motors is: current ....; voltage ....; cycle .....

CAPACITIES OF EFFICO ROTARY BALL BEARING VENTILATORS—AUTOMATIC WIND-ELECTRIC
Cubic Feet of Air Exhausted Per Minute

Wind velocity, m.p.h.	Temperature difference in degrees Fahrenheit between air in building and outside air								
	0°-10°	10°-20°	20°-30°	0°-10°	10°-20°	20°-30°	0°-10°	10°-20°	20°-30°
	12-in. Ventilator			**18-in. Ventilator**			**24-in. Ventilator**		
0 to 5	440*	515	560	850*	950	1040	1600*	1780	1900
	30-in. Ventilator			**36-in. Ventilator**			**42-in. Ventilator**		
0 to 5	2300*	2690	2900	3400*	3810	4100	4500*	5010	5500
	48-in. Ventilator			**54-in. Ventilator**			**60-in. Ventilator**		
0 to 5	5900*	6700	7400	7300*	8450	9500	9300*	10600	11900
	72-in. Ventilator			**84-in. Ventilator**			**96-in. Ventilator**		
0 to 5	13500*	14600	16000	18000*	21000	23000	22500*	27000	29000

Greater capacities by adjustment can be made after installation.
*Regularly furnished.

DIMENSIONS OF EFFICO WIND-ELECTRIC VENTILATOR

Ventilator sizes, in., corresponding to those in capacity table	Dimensions, in. (see diagram)					Thickness of metal			Motor h.p.
	A Actual size of ventilator	B Base	C Height of blades	D Diam. of storm band	E Height to propellor blades	Gage G. I. Cowl	Gage G. I. Base	Copper, oz.	
12	14	20	8	21¾	32	24	22	16	
18	19	26	10	28½	32	24	22	18	1/30
24	25	38	14	40	40	24	20	18	
30	31	40	14	50	42	24	20	20	
36	37	44	18	60	45	22	18	24	1/6
42	43	50	22	68	51	22	18	24	
48	49	56	24	76	51	22	18	24	
54	55	62	24	86	51	22	18	24	¼
60	61	66	24	98	55	22	18	24	
72	73	80	30	114	55	20	16	24	
84	85	92	40	130	55	20	16	32	
96	97	116	45	153	55	20	16	32	½

R dimensions—5 in. on all sizes.

S E Ventilators

The S E Ventilator heads are made of only prime sheets. The fabricated members are carefully formed to offer the least resistance to the air flow. These members for galvanized ventilators are rustproofed after forming. For copper ventilators, the smaller size members are made of copper. For very large ventilators the members are iron, rustproofed. Electric welding is used considerably, all rivets have washers under the burred end of rivet, like all Hirschman products.

Design and Appearance—A ventilator designed to exhaust air at the highest possible velocity. Strength (sturdy construction), weatherproof, high syphon exhaust capacity and appearance, in the order named are given consideration in the design of this ventilator.

S E Ventilator Head

Exhaust Head—The design is such that air driven 1200-ft. velocity through the head, registers only .015 water gauge static pressure. This is unequalled by any other known shape. Thus for a fan or high heat exhaust head, it is unequalled. When so used and the fan is cut off the ventilator still ventilates as a syphon ventilator. There are no shutters to blow or freeze shut.

Weatherproof—Absolute—no rain, snow or storm can beat in. Is also vision-proof, will resist back-drafting during a 5-mile wind against an adverse temperature difference of 10° F. Also during the same wind velocity will not back-draft unless a greater than static pressure resistance of .025 water gauge.

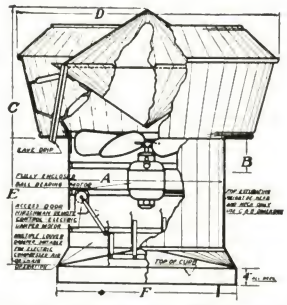
Exhaust Capacity Syphonage Principle—Note capacity chart, these capacities are conservative. The S E is a very high grade stationary type syphon ventilator. It starts exhausting at slightly over a 2-mile wind without any temperature difference.

F Fan Ventilator (Non-automatic)

For free air or as a pressure blower is decidedly an apparatus of high merits for a specific application.

Recommendation—A high class ventilator where a high exhaust velocity against resistance is required, especially at certain periodical times. Where the Effico Rotary Head, or the Effico Wind-Electric Automatic Ventilator, due to obstructed location or its moderate even capacity is not required, then we recommend the F Fan Ventilator.

Construction—Very heavily made and employing only the best types of motors. *Access door to motor and fan provided.* Motor and fan protected against the elements as well as if installed in the building.



F Fan Ventilator (Electric) Showing Electric Damper Control
(Patented)

Dampers—Chain operating, close fitting damper supplied with all sizes unless otherwise ordered. Can be supplied with circular multiple louver damper with, or for, pneumatic or Hirshman electric damper motor.

Fire Damper—Fusing link furnished if required. There are no outside louvers to freeze or blow shut.

Bases—Included with fan ventilators.

Cost—A moderately priced exhauster of unusual merits.

Wind Direction—There is no front or back to this ventilator; the wind helps the F ventilator and is not an interference.

DIMENSIONS OF S E AND F VENTILATORS

Dimensions, in. (see diagram)						Thickness of metal			
						Ga. galvan.		Oz. copper	
A	B	C	D	E	F	Head	Base	Head	Base
12	6	10	22	24	16	24	24	16	16
18	6	16	32	24	24	24	24	16	16
24	8	21	42	30	30	24	24	16	16
30	8	27	52	30	36	22	20	18	20
36	10	33	36	30	42	22	18	20	24
42	10	38	71	30	48	20	18	20	24
48	12	42	81	36	54	18	18	20	24
54	12	46	91	36	60	18	18	20	24
60	12	60	102	36	66	18	16	24	24
66	16	66	102	36	72	18	16	24	32
72	16	70	120	36	78	18	16	24	32
84	16	76	120	36	92	18	16	24	32

For utilizing heads only use "B, C and D" dimensions.

GRAVITY EXHAUST CAPACITIES S E VENTILATOR HEADS
Cubic Feet of Air Exhausted Per Minute

Wind velocity, miles per hour	Temperature difference in degrees Fahrenheit in building and outside											
	0	10	20	30	0	10	20	30	0	10	20	30
	12-in. Ventilator				18-in. Ventilator				24-in. Ventilator			
5	160	275	330	380	360	610	740	800	600	1050	1280	1380
10	250	360	460	525	560	715	950	1050	900	1400	1675	1800
	30-in. Ventilator				36-in. Ventilator				42-in. Ventilator			
5	940	1660	2000	2200	1300	2400	2950	3150	1900	3275	4000	4300
10	1410	2220	2600	2800	2100	3160	3700	3900	2700	4300	5000	5300
	48-in. Ventilator				54-in. Ventilator				60-in. Ventilator			
5	2450	4200	5100	5500	3100	5375	6400	6800	3800	6600	7850	8500
10	3400	5390	6500	7000	4400	7200	8300	8800	5500	8000	9200	10000
	66-in. Ventilator				72-in. Ventilator				84-in. Ventilator			
5	4600	8000	9550	9800	5500	9500	11400	12000	7400	13000	14800	16000
10	6500	10600	11500	12000	7700	12700	14000	15000	9800	17400	19000	22000

CAPACITIES OF HIRSCHMAN "F" FAN VENTILATOR

Size of stack, in.	Fan speed, r.p.m.	Cu. ft. min. less than 1/8 in. S.P.	Cu. ft. min. 1/4 in. S.P.	Cu. ft. min. 3/8 in. S.P.	Cu. ft. min. 1/2 in. S.P.	H.P.	Type of motor
12	1750	850	600	400	.....	1/30	S.R.
	1150	500†	300	.....	.....	1/30	S.R.D.
18	1080	1200†	.....	.....	.....	1/30	S.R.
	1750	1800	1400	1000	.....	1/8	S.R.D.
	1750	2000	1600	1200	1000	1/6	S.R.D.
24	860	2600†	1500†	920	.....	1/6	S.R.D.
	1080	3400*	2400*	1500*	.....	1/4	S.R.D.
	1750	4400	3600	3200	2500	1/2	S.R.D.
30	1080	4000*	3200*	2400*	.....	1/4	S.R.D.
	1080	6000	3900	3000	2100	1/2	S.R.D.
36	680	5000†	4000†	.....	.....	1/2	S.R.D.
	1080	8000	6000	4200	.....	3/4	S.R.D.
	1080	8500	7600	6600	5400	1	S.R.D.
42	680	6200	5000	.....	.....	1/2	S.R.D.
	1080	9000	5500	.....	.....	3/4	S.R.D.
	1080	10000	6800	4600	2800	1	S.R.D.
	1100	13000	9000	7000	6000	2	S.R.D.
48	680	8600†	7000†	.....	.....	1	S.R.D.
	410	8000†	6000	.....	.....	1	S.R.D.Q.
54	365	11000†	8500	.....	.....	1	S.R.D.Q.

Prefix letters in motor column indicate kind of current for which the motors are available.

Alternating—S, single-phase, 60 cycle. R, two or three-phase, 60 cycle. T, single-phase, 25 cycle. Q, two or three-phase, 25 cycle. D, direct current.

†Very silent, suitable for talkie movies.

*Silent for schools, theaters, auditoriums and other quiet running requirements.

Suggested Specifications for Fan Ventilators—The Fan Ventilators shall be the size as shown in plans [square base] [round base] style, to be of [toncan iron] [copper] the motors of (....) r.p.m., (....) hp., (....) current, delivering each (....) c.f.m. They shall be the F Fan Ventilators as manufactured by W. F. Hirschman Co., Inc., Buffalo, N. Y.

KERNCHEN COMPANY

Ventilating Engineers
101 East Wacker Drive, CHICAGO, ILL.
FACTORY
SOUTH GARY, IND.
EASTERN OFFICE: 15 Beekman Street, NEW YORK, N. Y.—Telephone, Beekman 3-3448
AGENCIES IN PRINCIPAL CITIES

Product

"K-S-V's" (KERNCHEN SIPHONAGE VENTILATORS).

Also Utility Ventilators (Plain Type).

"K-S-V's" Are Correct Siphons

The correct siphon is the most powerful pulling force known to this field of ventilation. It not only exhausts, but it pulls terrifically. The siphons harness the lightest air currents, compressing and compelling them to co-act in mightily increasing the suction of air out through the ventilator.

TRADE-MARK

Construction

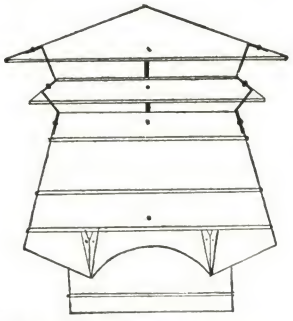
Simplicity of construction and complete absence of the friction inevitably involved in old-style rotary mechanisms make the "K-S-V" a troubleproof, lasting investment. Free area of outlet over 200% of pipe area. Nothing to choke or hinder. Friction at minimum, exhaust at maximum.

The eduction pipe is cylindrical with V-shaped notches or openings at the top, each covered by a siphon tapered inwardly toward the top, the total of four siphons being covered by a jacket of conical shape, whereby other siphons (four) are formed, greatly increasing the terrific pulling power. In addition, a top construction of two specially designed hoods is used, augmenting considerably the pulling force and making the unit stormproof.

The absence of friction, no revolving mechanism being present, means silent performance, nothing to wear out, nothing flopping around, no maintenance cost. A rotary requires a certain wind energy to swing it around *before it gets ready to ventilate*. The "K-S-V" *uses this wind energy to ventilate.*

Furnished in any size and made of any metal desired such as galvanized steel, Keystone copper steel, Armco iron, Toncan metal, cold rolled copper, aluminum zinc, monel metal, etc.

Furnished with or without base (see following page) damper or condensation arrestor.



"K-S-V" Drawn to Exact Proportion

Special Ventilation Service

The KERNCHEN COMPANY specializes in ventilation and its engineers are always available, gratis.

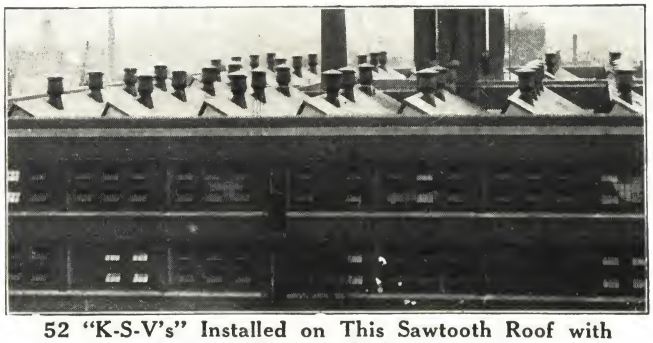
Particular attention given to difficult or unusual problems involving great heat as well as temperatures below the freezing point; steam conditions; elimination of condensation, moisture, fumes, gases or smudge, foul or vitiated air, in every type of building or room.

Specifications

Roof ventilators to be "K-S-V's" as manufactured by the KERNCHEN COMPANY, 101 East Wacker Drive, Chicago, Illinois, in the following sizes (specify sizes by neck diameter and quantity of each size).

Bases are to be "K-S-V's" as manufactured by the KERNCHEN COMPANY, 101 East Wacker Drive, Chicago, Illinois, and furnished in following types to fit ventilators (specify by type number; see following page and give pitch of roof in inches per foot).

Caution—Beware of imitations and infringements; protect yourself by specifying "K-S-V's."



52 "K-S-V's" Installed on This Sawtooth Roof with Pivoted Sash

Where Used

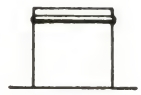
For all buildings and all bad air conditions. "K-S-V" does the work of three ordinary ventilators. Save this cost!

Booklet—"It Pulls"

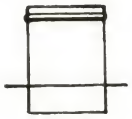
A postal will bring our latest illustrated booklet, "It Pulls," containing complete information concerning "K-S-V's" (Kernchen Siphonage Ventilators).

Five 42-in. Ordinary Ventilators Replaced by Five 36-in. "K-S-V's"

This is one of hundreds of instances where ordinary ventilators have had to be torn out and replaced by "K-S-V's." But there is *not one* instance we know or ever heard of where "K-S-V's" were replaced by any other kind of ventilator



No. 1
Round Base for Flat Roof



No. 2
Round Base for Flat Roof with Extension

No. 3
Round Base for Slant Roof

No. 4
Round Base for Slant Roof with Extension

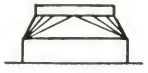
No. 5
Round Base for Gable Roof

No. 6
Round Base for Gable Roof with Extension

No. 7
Square to Round Base for Flat Roof

No. 8
Square to Round Base for Slant Roof

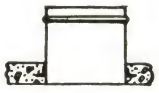
No. 9
Square to Round Base for Gable Roof



No. 10
Square to Round Base with Shoulder for Flat Roof

No. 11
Square to Round Base with Shoulder for Slant Roof

No. 12
Square to Round Base with Shoulder for Gable Roof

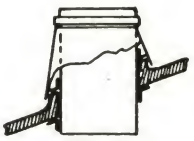


No. 13
Round Base for Flat Concrete Roof with Angle Iron Ring at Bottom

No. 14
Square to Round Base for Flat Concrete Roof with Angle Iron at Bottom

No. 15
Round Base for Flat Concrete Roof with Curb

No. 16
Square to Round Base for Flat Concrete Roof with Curb



No. 17
Straight Round Base for Federal or Similar Concrete Tile Roof

Official Tests

Nothing is more deceptive than irresponsible, theoretical tests.

Exaggerated performance figures will appear to be justified at times by laboratory tests conducted under conditions which are more favorable than those found in actual service.

It is only when laboratory and *field* tests agree, that the results can be taken as conclusive.

Note particularly the consistent figures in the two accompanying tests by national authorities, one conducted in the laboratory, the other on the Leader Building installation in Cleveland, Ohio.

OFFICIAL TEST OF "K-S-V's" (KERNCHEN SIPHONAGE VENTILATORS) CONDUCTED BY ARMOUR INSTITUTE OF TECHNOLOGY, CHICAGO

SHOWING EXHAUST UNDER DIFFERENT WIND VELOCITIES, AND WHICH SCIENTIFICALLY PROVES THE TERRIFIC PULLING POWER AND 100% TO 300% MORE EFFICIENCY THAN THAT OF OTHER VENTILATORS

Wind velocity, miles per hour	Air pulled through ventilator, lineal ft. per min.	Size of ventilator, in.	Cubic feet air pulled through ventilator: 12	14	16	18	20	24	30	36	42	48
5	460	Per min.	364.0	492.2	644.0	814.2	1,003	1,444	2,250	3,247	4,485	5,776
		Per hr.	21,840	29,532	38,640	48,852	60,180	86,640	135,000	194,820	269,100	346,560
10	670	Per min.	525.0	717.0	938.0	1,186	1,460	2,103	3,280	4,730	6,533	8,412
		Per hr.	31,500	43,020	56,280	71,160	87,600	126,180	196,800	283,800	391,980	504,720
15	960	Per min.	754.0	1,027	1,344	1,699	2,100	3,014	4,700	6,777	9,360	12,056
		Per hr.	45,240	61,620	80,640	101,940	126,000	180,840	282,000	406,620	561,600	723,360
20	1,220	Per min.	957.0	1,305	1,708	2,159	2,660	3,830	5,980	8,613	11,895	15,320
		Per hr.	57,420	78,300	102,480	129,540	159,600	229,800	358,800	516,780	713,700	919,200
25	1,480	Per min.	1,161	1,584	2,072	2,619	3,230	4,647	7,250	10,448	14,430	18,588
		Per hr.	69,660	95,040	124,320	157,140	193,800	278,820	435,000	626,880	865,800	1,115,280

(Signed) G. F. GEBHARDT, A. H. ANDERSON, Mechanical Engineers, Armour Institute of Technology

Case School of Applied Science—Test Nov. 6, 1913 on Roof of Leader Building, Cleveland, Ohio		Armour Institute of Technology—Test April 17, 1911, in Laboratory
15 inches	Diameter of ventilator	15 inches
5.32 miles per hour, or 6⅔% stronger than Armour's	Velocity of outside wind	5 miles per hour
497	Velocity of air pulled through ventilator per min., lineal ft.	460
610	Exhaust of ventilator per min., cubic ft.	564
Outside temperature, 67° Fahr.	Inside temperature, 85.8° Fahr.	

(Signed) F. H. Moss
Head of Mech. Eng. Dept.,
Case School of Applied Science

(Signed) W. P. Kellogg
A. H. Anderson
Mech. Engrs., Armour Institute of Technology

Note: We challenge all to furnish such authentic unbiased and *official* tests as conducted and *signed* by three institute of technology professors.

A PARTIAL LIST OF CORPORATIONS USING "K-S-V'S"

Railroads all over the country
U. S. Steel Corporation
Republic Iron & Steel Co.
Carnegie Steel Co.
Standard Oil Co.
Buick Motor Co.
Pullman Co.
Studebaker Corporation
American Can Company
Continental Can Company
Packard Motor Car Company
Ford Motor Car Company
Ajax Forge Co.
International Harvester Co.
Jones & Laughlin Steel Co.
National Cash Register Co.
American Car & Foundry Co.
Western Electric Company
Barrett Mfg. Company
Willys Overland Company
Thompson-Norris Paper Company
Armour & Company
Swift & Company
Sears, Roebuck & Co.
Montgomery Ward & Co.
General Chemical Company
Marathon Paper Company
Bryant Paper Company
Grays Harbor Paper Co.
Crown Willamette Paper Co.
Churches and Hospitals

Details of "K-S-V" Ventilator Bases and "K-S-V" Test Data

ESTABLISHED 1866

MERCHANT & EVANS CO.

Manufacturers of Roof Ventilators

PHILADELPHIA, PA.

Also Sold by: GLOBE AUTOMATIC SPRINKLER COMPANY (General Agents)

OFFICES IN PRINCIPAL CITIES

Products

"STAR" VENTILATORS: Standard and Fire Retarding Types.

For "Almetl" Doors and Shutters, see Manufacturers' Index.

Standard "Star" Ventilators

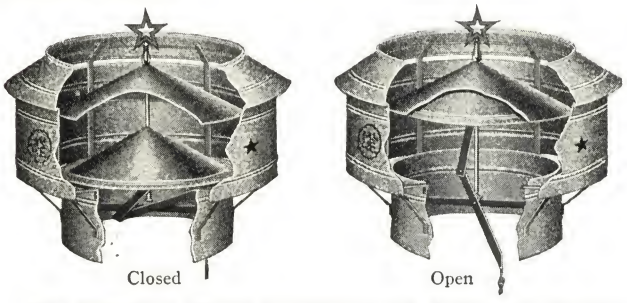
Standard "Star" Ventilator

A scientific combination of the ejector and siphon principles applied to stationary roof ventilators, which in conjunction with large exhaust outlets protected to defy the elements, gives a maximum of efficiency at a minimum of investment cost.

Fire Retarding "Star" Ventilators

Of the same appearance and construction details as the Standard with the addition of a patented gravity damper. A chain connected by a fusible link holds the damper in any position between open and closed; and is arranged to automatically drop the damper to a closed position when exposed to a high temperature.

This style is particularly recommended for factories, warehouses and buildings where control of heat losses during winter months is desired.



Fire Retarding "Star" Ventilator with Automatic Gravity Damper (Patented)

Bases

Bases are regularly made of the same weight material as the ventilator proper. Regulation bases are made square at the bottom and gradually taper to cylindrical shape at the top. Straight pipe bases furnished when requested. All bases have roof flanges of suitable width. All seams and joints thoroughly soldered to prevent leakage.

Flat disc counterbalanced dampers, strongly reinforced for rigidity, operated by either cord or chain, also furnished when required. These flat dampers are held on specially designed pivots, made of brass to prevent corrosion.

Exhaust Capacity

Recent comparative tests based on wind action only of roof ventilators conducted at Engineering Experiment Station, Kansas State Agricultural College, developed the "Star" to have a greater average exhaust capacity than any in the following groups of types tested: open pipe, plain stationary, siphoning stationary, and plain rotary, with wind velocities at 4, 6, 8 and 10 miles per hour.

EXHAUST CAPACITIES OF "STAR" VENTILATORS

Size, in.	Gauge steel	Weight C. R. copper, oz.	Exhaust* capacity in cu. ft. per hour based on wind action only at 10 miles per hour; no temperature difference	Exhaust capacity in cu. ft. per hour based on wind velocity at 10 miles per hour; temperature difference 20° F. and height above intake 20 ft.	Regulation square to round bases: Opening in roof, in.	Regulation square to round bases: Height of base, in.
3	26	16	1,260	1,880	.....	.....
4	26	16	2,230	3,380	.....	.....
5	26	16	3,490	5,280	.....	.....
6	26	16	5,020	7,600	.....	.....
7	26	16	6,830	10,340	.....	.....
8	26	16	8,930	13,510	10x10	15
9	26	16	11,300	17,100	12x12	15
10	26	16	13,950	21,110	12x12	24
12	24	16	19,930	30,160	14x14	24
14	24	16	27,350	41,380	16x16	24
15	24	18	31,400	47,500	18x18	30
16	24	18	35,720	54,040	18x18	30
18	22	18	45,200	68,400	22x22	30
20	22	20	55,800	84,440	24x24	30
22	22	20	67,530	102,170	28x28	30
24	22	20	79,740	120,645	30x30	30
26	22	20	93,580	141,580	32x32	30
28	20	20	108,520	164,200	34x34	36
30	20	20	124,570	188,470	36x36	36
32	20	20	141,750	214,460	38x38	36
34	20	20	160,020	242,120	40x40	38
36	20	20	179,400	271,440	42x42	40
40	20	24	221,490	335,110	48x48	48
42	20	24	244,190	369,450	50x50	48
44	20	24	267,990	405,470	50x50	48
46	20	24	292,730	442,910	52x52	48
48	20	24	318,930	482,530	56x56	48
54	18	24	403,640	610,710	64x64	48
60	18	24	498,340	753,984	72x72	60
64	18	24	566,810	857,590	.....	.....
66	18	24	602,980	912,310	.....	.....
72	18	24	717,600	1,085,720	.....	.....
84	18	24	976,740	1,477,810	.....	.....
96	18	24	1,275,750	1,930,200	.....	.....

*According to comparative tests made by engineering experiment station, Kansas State Agricultural College.

Prices on application.

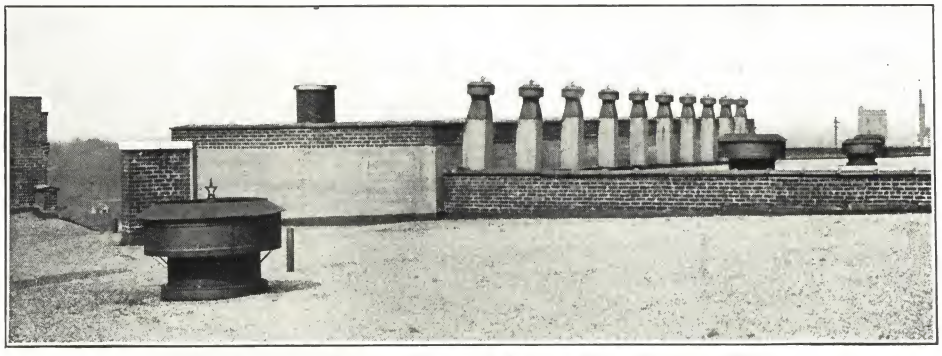
Ventilators larger than 50-in. diameter shipped in sections.

Specifications for "Star" Ventilators

The roof ventilators where shown on the plans shall be "Star" [Standard Type] [Fire Retarding Type] as manufactured by MERCHANT & EVANS CO., Philadelphia, Pa. Ventilators to be of sizes shown and shall be constructed of (state material) and of the manufacturer's standard gauge for the sizes shown.

Ventilator bases to be of the sizes and types shown and made of the same gauge and material as the ventilator heads.

Base without Ventilator Showing Disc Damper



A Notable Installation, Wagner Baking Co., Detroit, Mich.

Where forty-five 24-in. and six 36-in. copper fire retarding Star Ventilators are installed

PENN VENTILATING COMPANY

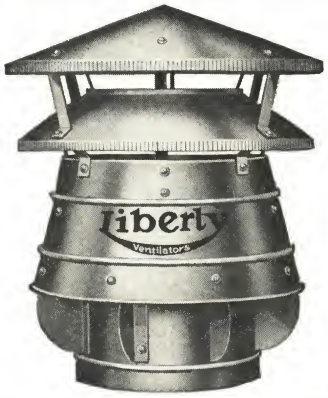
Pul-Air, Liberty, Perfection, Penn Ventilators and Electric Power Ventilators

2008-2010 East Arizona Street, PHILADELPHIA, PA.

OFFICES IN ALL PRINCIPAL CITIES

Liberty Ventilator

Because of the ingenious, effective way in which it harnesses and utilizes outside air currents, the Liberty Ventilator represents the supreme achievement of modern engineering skill.



All of the air currents—upward, downward, horizontal or swirling—are brought under control and forced to perform their task of drawing heat, foul air, steam fumes, smoke or floating dust up and out of the building.

The Liberty Ventilator utilizes four principles of physical science: (1) air impingement; (2) positive and negative air action (pressure and vacuum); (3) siphonage; (4) stack action.

It has eight wind catching fins which stop the wind and turn it upwards through the large cone-shaped skirt which is tapered at the top to increase the velocity of the current. A free area is maintained throughout the ventilator to prevent choking at any point.

The lower cone flange keeps rain and snow out of the flue, and the strong overhead cone makes it absolutely stormproof.

Cross section showing sturdy construction throughout. Arrows indicate path of outside air currents and foul air being exhausted through ventilator from building interior

LIBERTY VENTILATOR DATA

Size	Area sq. in.	Exhaust per hour cu. ft. in 8-mile wind	App. shipping wt. lb.	Gauge of metal
6	28	6364	6	26
7	38	8661	11	26
8	50	11331	14	26
9	64	14315	16	26
10	79	17671	19	24
12	113	25446	26	24
14	154	34638	36	24
16	201	45234	51	24
18	254	57252	65	24
20	314	70697	90	22
22	380	85536	103	22
24	452	101802	125	22
26	531	119459	150	22
28	616	138542	180	22
30	707	159054	220	20
36	1018	229038	395	20
42	1385	311721	460	20
48	1810	405360	600	20
54	2290	515160	850	20
60	2827	636000	900	18–20
66	3421	769800	990	18–20
72	4072	915948	1400	16–18
84	5542	1246752	2150	14–16

Years of experimentation and testing by skilled ventilating engineers have resulted in the manufacture of this most efficient ventilator, which is not dependent on stack action.

Pul-Air Ventilator

The Pul-Air Ventilator is the result of nearly a quarter of a century's specialized experience in the ventilating field.

It successfully meets, in every particular, the demand for a highly efficient, weatherproof ventilator at a moderate price.

It is heavily and substantially built by expert workmen. It has a free air exhaust and is proof against back-draft. It is easy to install and has no upkeep expense attached. It is architecturally beautiful, and it can be made with glass top, if desired, thus serving the double purpose of ventilator and skylight. It can also—for the use of hospitals, schools, mills, railroads, and in fact, any type of enclosure—be readily screened insect and bird proof.

It has thoroughly demonstrated its superiority over the ordinary ventilator over a long period of time, and under practically every condition of overhead ventilation. It has been used on 100 prominent buildings.

Made in any metal. Prompt shipment from large stocks.

A Noteworthy Liberty Ventilator Installation

One of the World's Largest Ventilator Installations—Aluminum Company of America, Saguenay River, Canada

35 60-in. and 5 48-in. aluminum ventilators were used on this installation. We specialize in the manufacturing of aluminum ventilators using aluminum throughout

H. H. ROBERTSON COMPANY

Manufacturers of Ventilators

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CAN.; ELLESMERE PORT, CHESHIRE, ENG.

DISTRICT OFFICES

BALTIMORE, MD. BUFFALO, N. Y. CLEVELAND, OHIO HOUSTON, TEX. NEW YORK, N. Y. PITTSBURGH, PA.
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BRANCH OFFICES AND AGENCIES

ALLENTOWN, PA. DENVER, COLO. JACKSONVILLE, FLA. RICHMOND, VA. SCRANTON, PA.
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PORTLAND, ORE.

ENGLAND, ELLESMERE PORT, CHESHIRE: Mersey Iron Works

CANADA AND NEWFOUNDLAND: H. H. ROBERTSON CO., LTD., TORONTO, ONT., AND MONTREAL, QUE.

Products

ROBERTSON VENTILATORS and BASES; HOODS and DUCTS; LOUVRES.

The Robertson Ventilator is protected by United States Patent No. 1,589,581, June 22, 1926; Canadian Patent No. 244,617; other patents pending; also covered by patents in other countries.

For Robertson Protected Metal (RPM) for Roofing, Siding, Flashings, etc., Protected Steel Roof Decks and V-Beam Roofing, Robertson Glazing Construction, Skylights, Sidewall and Special Sash, see Manufacturers' Index.

TRADE-MARK

Robertson Ventilation Service

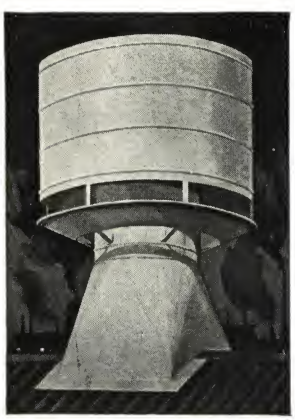
The Robertson Company offers a scientifically designed ventilator with multiplied exhaust capacity and, in addition, it places at your disposal a complete ventilation service which will help you to take advantage of many factors which may vastly increase the effectiveness of your ventilators.

There are so many factors which affect the rate of discharge in a ventilator that it has never been possible for any one to work out a scientifically exact formula for gauging ventilation requirements. In the absence of such a formula, the Robertson Company has made inspections of actual ventilator installations all over the country, in practically every type of industrial building, and has thus built up a file of experience records which is one of the finest collections of ventilation data extant. In addition, the Robertson Company has developed a complete set of tables which show how much air a ventilator of any given size will move under any given set of conditions.

With these facts at their disposal, the Robertson Ventilation engineers can tell you what the ventilation requirements will be in any type of building, and how best to obtain the ventilation you need.

Robertson Ventilator

Each size of Robertson Ventilator has so much greater exhaust capacity than is customarily associated with that size that it is often possible to procure ample ventilation with a smaller number of Robertson Ventilators than with other types which have a more standard rate of discharge. This fact should always be borne in mind when figuring costs on Robertson Ventilators. The Robertson Ventilation Data Book (free copy on request) gives the capacities of any size Robertson Ventilator.



Robertson Ventilator

The greater exhaust capacity is due (1) to the fact that the actual area of the Robertson Ventilator is increased by a suction band which displaces more air and causes a greater vacuum action from passing winds, and (2) the fact that the free air outlets of the Ventilator itself are *twice* the area of the stack.

Exhaust Capacities—The condensed table below gives the exhaust capacities of Robertson Ventilators of various sizes under one given set of conditions. A booklet containing 15 pages of complete tables shows exactly what these ventilators in various sizes will do under *every* reasonable variation of those conditions. From that booklet it is possible for you to figure accurately how many ventilators you need and what size they should be. These figures are dependable and represent *actual* measured discharge capacities and are not to be confused with the so-called "rated" capacities.

Robertson Ventilator Capacities—These figures are based on the following conditions: Wind velocity—8 miles an hour; differences in temperature of indoor and outdoor air—20° F.; height of ventilators above air intake—50 ft.;

Size, in.	Discharge cap. per min., cu. ft.	Size, in.	Discharge cap., per min., cu. ft.	Size, in.	Discharge cap., per min., cu. ft.	Size, in.	Discharge cap., per min., cu. ft.
12	462	24	1848	42	5658	66	13872
16	898	30	2882	48	7398	72	16646
18	1041	36	4160	54	9341	84	22472
20	1499			60	11560		

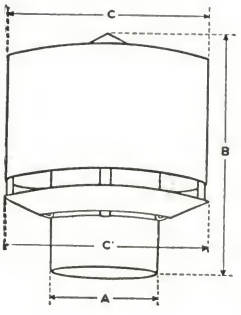
Construction Details of Robertson Ventilators—The Robertson Ventilator is a stationary ventilator and is built as sturdily as any other part of your building. The various parts are joined together into a strong, rigid unit by a complete system of bracings with bolts and lock washers. It will withstand a pressure equal to a dead load of 30 lbs. per sq. ft. A device invented by the Robertson engineers prevents wind deflected upwards from pitched roofs from entering the ventilator. Its efficiency does not depend on the direction of the wind.

Materials—Robertson Ventilators are made of Robertson Protected Metal (RPM), copper, galvanized steel, aluminum or any other material that may be specified. RPM is used where corrosive conditions are bad, as RPM is a corrosion-proof steel protected by the exclusive Robertson process of factory-applied external coatings.

Dimensions, Gauges and Weights—As can be seen from the table below, Robertson Ventilators are made in all sizes used in standard practice.

You will note, too, that the material used in the Robertson Ventilators of each size are of a gauge which assures rigidity, strength and endurance. Below are given the dimensions, weights and the gauges of Robertson Protected Metal and galvanized iron.

Complete erection instructions are forwarded with each ventilator.

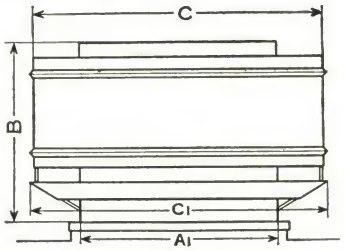


Dimensions, in.				Gauge* gal. and RPM	App. net wt., lbs.		App. shpg. wt., lb.	
A	B	C	C1		Galv.	RPM	Galv.	RPM
12	22 5/8	22 3/4	24	24	31	46	64	81
14	27 1/16	26 1/2	28	24	40	59	77	99
16	29 3/4	30 1/8	32	24	48	70	96	125
18	32 7/8	34	36	24	57	87	138	172
20	38 1/8	37 1/2	40	24	71	103	166	209
24	45	45 3/8	48	22-24	110	160	299	357
30	55 3/8	57	60	20-22	191	247	443	529
36	67 3/4	67 1/2	72	20-22	275	358	545	647
**42	74 7/8	79 3/8	84	18-20	528	584	786	933
**48	89 3/8	91	96	18-20	635	782	1026	1219
**54	101 3/4	102	108	18-20	796	969	1219	1465
**60	108 5/8	113	120	18-20	1127	1395	1697	2052
**66	126 1/2	125	132	18-20	1360	1645	2182	2589
**72	129	136	144	18-20	1680	1995	2476	2932
**84	149 3/4	158 3/4	168	16-20	2314	2805	3146	3784

*Where two gauges are shown, heavier gauge is for stack only.

**Indicates that ventilator is shipped partially knocked down.

Robertson Rectangular Ventilators



Made in rectangular shapes to harmonize with the architectural designs of buildings where straight lines are desirable. Popular for use in schools, public buildings, power houses and similar buildings.

The tables herewith show dimensions, net weights and shipping weights of Robertson Rectangular Ventilators.

All capacity tables are based upon the round-style Robertson Ventilators; in the tables you will find, opposite each size of Rectangular Ventilator, the size of the Robertson Round Ventilator of corresponding capacity.

The capacities of all sizes of round-style ventilators are given in the Robertson Ventilation Data Book. Send for a copy.

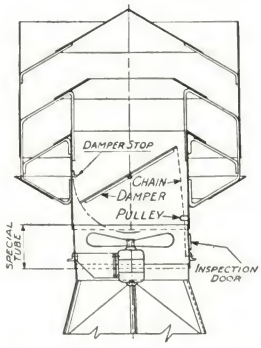
ROBERTSON RECTANGULAR VENTILATORS
Figures here refer to dimensions on drawing above

Dimensions, in.				Gauge, galv. and RPM	App. net wt., lb.		App. shpg. wt., lb.		Size of Robt. Round Vents having same exhaust cap., in.
Size A1	B	C	C1		Galv.	RPM	Galv.	RPM	
8 x 16	15 5/16	23 1/8	24	22	31	46	62	77	12
10 x 20	20	29 1/2	30	22	48	70	88	110	16
12 x 24	23 1/4	34 3/4	36	22	57	87	127	157	18
18 x 36	34 1/2	52	54	22	110	160	289	339	24
24 x 48	46	69 3/8	72	22	275	358	335	618	36
30 x 60*	63 5/16	87	90	22	528	584	638	694	42
36 x 72*	74 1/4	103 1/2	114	22	796	969	1061	1234	54
42 x 84*	80 7/8	121 3/8	126	22	1360	1645	1731	2015	66
48 x 96*	91 5/16	139	144	22	1680	1995	2084	2398	72
54 x 108*	98 7/8	156	162	22	2314	2805	2869	3360	84
60 x 120*	119 5/8	173	180	22	3340	3804	4143	4606	90
66 x 132*	121 3/16	191	198	22	3890	4426	4828	5363	96

*Shipped partially knocked down.

Robertson Fan Ventilators

There are many industrial buildings where the need for ventilation is greater at one period than another. For example, in foundry buildings when pouring is being done the requirements may be high at one time of the day and much lower at another. Or in certain buildings they may be higher for a few months in the year, as in the south during the summer.



Fan Combined with Robertson Ventilator

The Robertson Company therefore has developed a power fan which is capable of stepping up the exhaust capacity of a ventilator when conditions are bad. This fan is installed in the ventilator itself and is designed to utilize the great free air outlet area of the Robertson Ventilator.

TYPICAL CAPACITIES OF ROBERTSON VENTILATORS WITH FANS

Diameter of ventilator, in.	Diameter of fan, in.	Motor hp.	Total exhaust of fan and ventilator, cu. ft.*
30	24	1/4	5058
36	30	1/2	8354
42	30	1/2	9415
48	36	1/2	12776
54	42	1	16895
60	48	1 1/2	23935
66	54	2	25916
72	54	3	30670

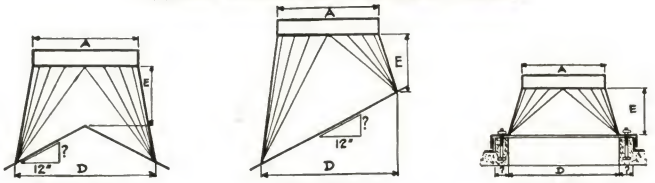
Table is for fans in ventilators where there is no duct in connection with the installation.

*Based on 30° temperature difference; 6-mile wind; 50′ 0″ stack action.

Robertson Ventilator Bases

Bases can be furnished with Robertson Ventilators to meet the requirements of any kind of roof. The three types diagrammed at the upper right are most commonly used. Types 1 and 3 are made to fit roofs of any slope; in ordering specify type of base and roof slope. Type 6 is made to fit over wood, concrete or other curbs; when ordering give size of opening and curb thickness. Round to square bases are strongest and are shipped unless special construction is ordered.

Typical Robertson Ventilator Bases



Type No. 1 Type No. 3 Type No. 6

DIMENSIONS, GAUGES AND WEIGHTS OF VENTILATOR BASES

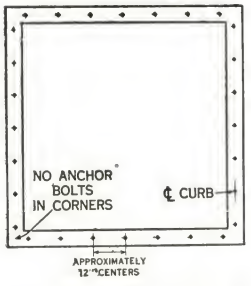
Dimensions, in.			Gauges, RPM and galvanized	Approximate net weight, lb.		Approx. shipping weight, lb.	
Size A	Size D	Size E		Galv.	RPM	Galv.	RPM
12	16 x 16	10	22	12	16	56	64
14	18 x 18	10	22	18	23	63	73
16	21 x 21	10	22	25	30	66	77
18	24 x 24	10	22	35	40	79	90
20	28 x 28	10	22	45	55	98	111
24	32 x 32	10	22	55	75	106	120
30	38 x 38	12	20	75	100	143	162
36	45 x 45	14	20	110	140	173	200
*42	52 x 52	**14	18	140	180	273	299
*48	60 x 60	**15	18	190	230	432	495
*54	68 x 68	**16	18	240	300	542	618
*60	78 x 78	**20	18	300	380	539	627
*66	87 x 87	**22	18	360	480	638	740
*72	96 x 96	**24	18	460	580	841	968
*84	110 x 110	**26	16	660	770	1090	1221
*90	118 x 118	**28	16	785	920	1329	1485
*96	126 x 126	**30	16	935	1085	1514	1689

*Ventilator base shipped in two pieces.

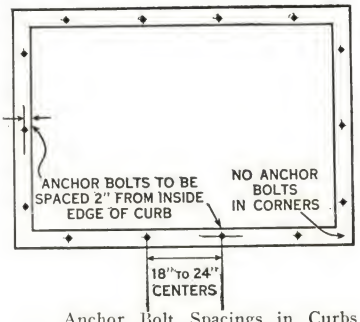
**Dimension E for Type No. 6 Bases, 42 in. and larger, is one-half of Dimension A.

Anchor Bolt Spacings

The diagrams herewith show the spacings to use in placing bolts for Robertson Round Ventilators in concrete curbs, and for Robertson Rectangular Ventilators for either concrete or wood curbs. For round ventilators on wood curbs, lag screws are usually used; on approximately 12-in. centers, ⅜-in. lag screws for ventilators up to 42-in. size, and ½-in. screws for ventilators over 42-in. size.



Anchor Bolt Spacing in Curbs for Robertson Round Ventilators



Anchor Bolt Spacings in Curbs for Robertson Rectangular Ventilators, 24x48 inches and up

Hoods and Ducts

Bad ventilation conditions in industrial buildings can often be corrected by erecting hoods or baffles around the processes which are creating the heat or fumes, and conducting the fumes directly from the building by means of ducts. This prevents the spreading of the fumes throughout the building. Robertson engineers are qualified to make a complete layout of hoods, baffles and duct work based on the conditions in your plant. Robertson Ducts are constructed of corrosion-proof RPM and no metal except RPM is exposed on the inside.

Robertson Louvres

Operating and stationary louvres for ventilation purposes are supplied by the Robertson Company. These are so designed that they present as high as 60% or more of free opening.

The operating louvres are slotted and interlocking so that they are weatherproof when closed. The frame of the louvre is a 2-in. channel, which prevents sagging. The louvres operate easily and with a minimum of friction.

The stationary louvres are designed to give the greatest possible free opening with the least possible chance for rain or snow to enter.

Robertson Louvres are supplied in galvanized steel and RPM (this patented Robertson material makes corrosion-proof louvres which last indefinitely under severe corrosive conditions and which can be opened easily and without sticking, even after being closed all winter).

Write for a copy of the Robertson Ventilation Data Book containing data on ventilation exhaust capacities under all probable conditions

ROYAL VENTILATOR COMPANY

412 Locust Street, PHILADELPHIA, PA.

Products

The ROYAL TRADE-MARK (Reg. U. S. Pat. Off.)

Manufacturers of "Royal" Ventilators of Galvanized Steel, Copper, Toncan Metal, Armco Iron, etc.:

Glass Top Ventilators; Rectangular and Square Ventilators with fire retarding dampers; Smoke Jack and Combination Ventilators; Insectproof and Birdproof Ventilators.

Double Cone Ventilators

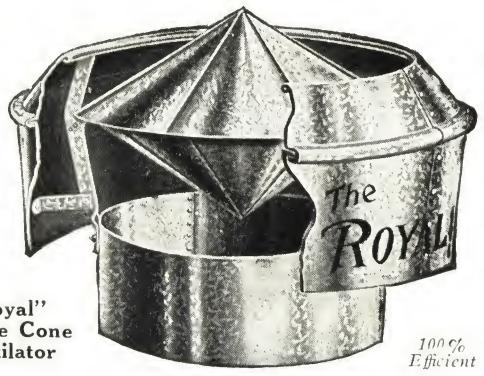
The "Royal" is so designed that full advantage is taken of the wind to produce additional draft. Complete renewal of air is accomplished under the most difficult and unusual conditions by installing "Royal" Double Cone Ventilators. The many unique and original principles embodied in the design of the "Royal" make it 100% effective and insure positive ventilation under any weather condition. Tapered frustums deflect the outer air over and under the edges of the frustums resulting in a powerful suction in the tube; this means maximum exhausting capacity. Foul gases, etc., will readily pass out even when no wind is blowing. The inverted or bottom cone of the "Royal" avoids the creation of eddies, the outgoing air having a free outlet unimpeded by excess friction. The upward moving foul air, etc., strikes the inverted cone and is drawn directly upward and outward.

The "Royal" is not affected by down-drafts.

Construction—Superior and exclusive construction features include lapped seams, giving three thicknesses of metal at joints, usually the weakest point. Wired edges and galvanized malleable iron or copper stays so arranged that they cannot interfere with the passage of air currents. The double cone has standing seams and gives two thicknesses of metal instead of one.

Adapted for foundries, powerhouses, factories, as well as schools and other buildings.

Made in standard sizes 2 to 96 in.



"Royal" Double Cone Ventilator

100% Efficient

Bases Made to Fit Any Type or Pitch of Roof

Cone Damper "Royal"

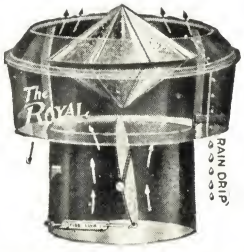
Used where low base is required. Lower cone is detached, slides on rod closing ventilator when lowered. Can be fitted with fusible link. Unobstructed air passage when damper is open

Specification

"Furnish and erect Royal Double Cone [Glass Top] Ventilators, manufactured by Royal Ventilator Company, Philadelphia, Pa."

"Royal" Glass Top Ventilator

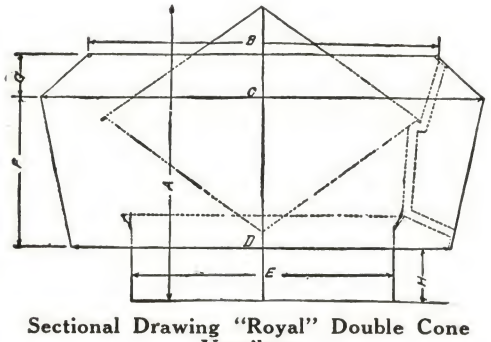
Contains greater glass area, reflects more light, gives more ventilation



"Royal" Ventilator with Disc Fire Damper

"Royal" Rectangular Ventilator

Designed to meet conditions where the maximum amount of ventilation is required at all times. Made in any desired size, with or without dampers, glass or metal top. Also made square



Sectional Drawing "Royal" Double Cone Ventilator

"ROYAL" DOUBLE CONE VENTILATOR DATA

Size, in.	Cu. ft. exhaust per min., wind 5 miles per hour		Dimensions, in.								Area, sq. in.	Gage of iron	Weight of copper, oz.
	Temp. dif. in bldg. and outside		A	B	C	D	E	F	G	H			
	0°	20°											
10	141	186	12	13	16	14	10	5	2	3	78	24	16
12	159	417	13	15	19	16	12	6	2	3	113	24	16
16	388	512	17	20	26	23	16	8	3	3	201	24	16
18	490	832	18	23	29	26	18	8	3	3	255	24	16
20	606	911	21	25	31	28	20	10	4	5	314	24	16
22	709	1059	24	26	34	32	22	11	4	5	380	24	16
24	874	1373	24	30	39	34	24	11	5	5	453	22	16
26	1005	1631	24	33	42	36	26	13	4	3	527	22	16
28	1186	2080	26	35	45	40	28	13	5	3	615	20	16
30	1364	2390	26	35	45	41	30	14	5	4	707	20	18
32	1551	2700	25	37	47	44	32	14	5	4	804	20	18
34	1765	2987	28	40	50	48	34	15	5	4	908	20	18
36	1961	3361	28	44	56	51	36	15	6	4	1017	20	18
40	2424	4124	34	47	61	55	40	16	7	5	1257	18 and 20	18
42	2673	4680	32	52	68	63	42	17	7	3	1386	18 and 20	18
44	3124	5310	35	54	70	64	44	18	7	5	1620	18 and 20	18
48	3489	5987	39	59	75	70	48	19	8	4	1809	18 and 20	20
54	5414	8304	42	68	84	77	54	22	9	4	2390	18 and 20	20
60	6665	9721	47	76	94	82	60	23	8	8	2807	18	24
66	7851	13346	52	81	103	94	66	26	9	6	3504	18	24
72	10682	16910	50	86	108	98	72	26	10	6	4071	18	24

Send for catalogue and detail card.

THE SWARTWOUT COMPANY

Rotary Ball Bearing Ventilators

18515 Euclid Avenue, CLEVELAND, OHIO

NEW YORK, N. Y., 103 Park Avenue
ST. LOUIS, MO., Chemical Building
ATLANTA, GA., Wm. Oliver Building
PITTSBURG, PA., Grant Building
CHICAGO, ILL., 549 W. Randolph Street

AGENTS AND STOCKS IN PRINCIPAL CITIES

Swartwout
Rotary Ball Bearing
Ventilators

Products

SWARTWOUT ROTARY BALL BEARING VENTILATORS.

Other products manufactured are Swartwout Ventilator Bases, Swartwout Air Intakes; Swartwout Power Plant Equipment, including Feed Water Regulators, Pressure Valves, Pump Governors, Vacuum Governors, Master Controls, Reducing Valves, Relief Valves, Drainage Controls, Traps, Separators, Exhaust Heads, Desuperheater Governors, Feed Water Heaters and Swartwout Metal Insulated Ovens for industrial baking, burning and drying.

Swartwout Rotary Ball Bearing Ventilator

Swartwout Rotary Ball Bearing Ventilators are built in standard sizes of from 10 to 72-in. diameters; of heavy galvanized armco ingot iron or special metal as required; collars two gauges heavier than body. All sizes shipped as completely assembled units. All sizes are equipped with bronze bearings and bronze balls; louver dampers and ratchet attachment with 6 ft. of chain. Additional chain at nominal charge.

Turning freely on accurately machined bearings, Swartwout Ventilators always face away from the wind. As the air currents maintain a continuous suction at the mouth, a steady flow of air is drawn from the building.

By means of efficient louvers and a chain attachment, the open area of Swartwout Ventilators is easily controlled from within the building. This provides regulation of ventilation so that the amount of air movement may be changed, if desired, by simply resetting the louvers. No other type of ventilator can be controlled in this manner.

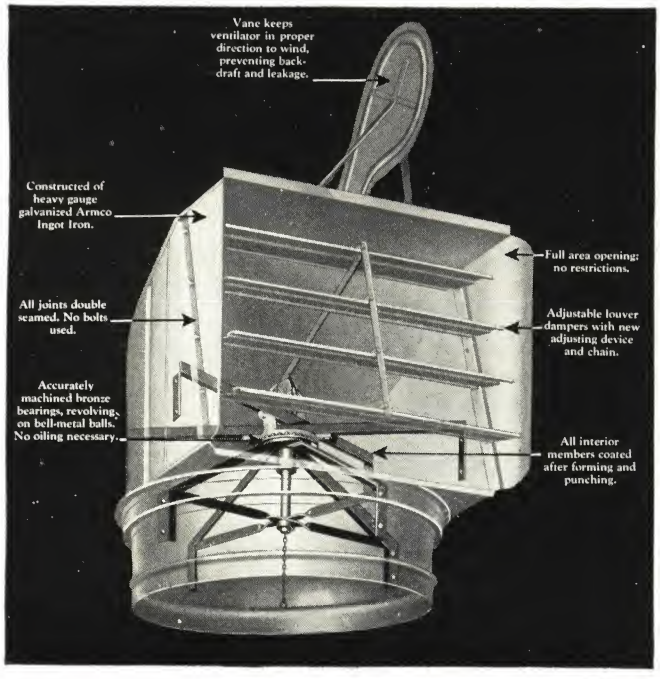
No Upkeep or Repairs—Efficient in design and sturdy in construction, Swartwout Ventilators operate automatically for years without the slightest attention. No oiling or greasing is necessary as moving parts are practically frictionless.

Determining Ventilator Sizes

The volume of air handled by any roof ventilator is affected by many conditions. Among these conditions are wind velocity, direction of wind, location and sizes of surrounding buildings or other obstructions and size of open windows, or doors, and methods of heating. In determining specifications, it is essential to use a sufficient factor of safety to be certain of complete ventilation at all times.

The cost of a few more or larger ventilators is insignificant when compared to the difference between satisfactory and unsatisfactory ventilation.

The conservative table herewith is presented for your guidance in determining ventilator sizes. The actual capacity will, in most cases, be much greater than that shown.

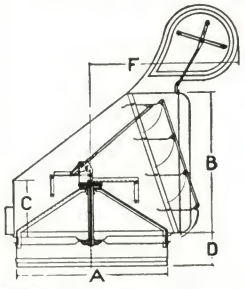


CONSERVATIVE AIR RATING OF SWARTWOUT ROTARY BALL BEARING VENTILATORS

Size of vent, in.	Cu. ft. per min.	Size of vent, in.	Cu. ft. per min.	Size of vent, in.	Cu. ft. per min.
12	275	24	1100	54	5500
14	370	30	1700	60	6850
16	490	36	2550	66	8250
18	650	42	3400	72	9850
20	800	48	4450		

Metal Ventilator Specification

All ventilators to be of rotary ball bearing type [galvanized armco ingot iron] [special metal], all interior members [of angle iron, coated after forming and punching] [stamped from galvanized metal]. Ventilators to turn sensitively on accurately machined special hard bronze bearings, employing bronze balls, and counterweighted on outside. Ventilators to be equipped with outside louver dampers to throw accumulated dirt outside of building, louvers to be operated from within by chains over brass pulleys. Gauge of metal to be THE SWARTWOUT COMPANY, Cleveland, Ohio, standard, as furnished in Swartwout Rotary Ball Bearing Ventilators.



DIMENSIONS OF SWARTWOUT ROTARY BALL BEARING VENTILATORS
Dimensions A, B, C, D, F, in inches

A	B	C	D	F	Gauge iron	Weight copper, oz.	Net weight, lb.	Crated weight, lb.
10	9 1/8	4	4	11 1/2	24	18	15	20
12	11	4 3/4	4	14 1/4	24	18	20	25
14	12 7/8	5 3/4	4	15 1/2	24	18	28	30
16	14 3/4	6	5	17	24	18	35	40
18	16 1/2	6 5/8	5	19	24	18	45	55
20	18 1/2	7 9/16	5	21	24	18	50	65
24	22	9	7 1/4	24 1/2	24	20	60	80
30	27 1/2	11 5/16	7 3/4	30	22	24	120	175
36	33	13 1/2	7 3/4	34 1/2	22	24	160	240
42	38 1/2	15 3/4	9 1/2	41 1/4	20	28	225	390
48	44	18 3/16	9 3/4	46 1/2	20	28	320	465
54	49 1/2	20 1/4	13 1/2	47	20	28	485	690
60	55	21 1/2	13 1/2	61	20	28	560	750
66	60 1/2	24 3/4	13 1/2	62 1/2	20	28	650	825
72	66	27	13 1/2	67 1/2	20	28	780	950

Drafting Room and Specification Helps

"The Gospel of Fresh Air," a new edition of the 44-page ventilation handbook that has proved so helpful to architects.

"Modern Ventilation Bulletins," devoted to outlining various ventilation problems and methods by which they have been solved.

"Ventilation Data Card," 8½x11 in. heavy card reference, covers air requirements, capacities, ventilator and base specifications and drawings.

Any or all of these will be sent without charge.

UNO VENTILATOR COMPANY

Exclusive Manufacturers of Electric-Welded Turbine Ventilators Equipped with Patented Oilless Bearings

TELEPHONE
Saugus 795

OFFICE AND WORKS
CLIFTONDALE, MASS.

UNO

"Sure As Sunrise"

The UNO VENTILATOR COMPANY was established in 1906. During the life of the Company thousands of Uno Ventilators have been manufactured and distributed by them through all the prominent metal jobbers of the country, for installation on practically every type of building, such as industrial plants, churches, theatres, restaurants, garages, etc.

The Uno is a positive mechanical cure for balky chimneys.

Uno Turbines are extremely durable, sensitive to the lightest breeze, weatherproof, absolutely impervious to heat, and are efficient when properly installed, under any and all conditions. They exhaust air infallibly whether that air be hot or cold, dirty or clean, damp or dry.

Construction

The Uno Turbine Ventilator derives its remarkable drawing power through centrifugal force.

When the breeze revolves the head, a strong centrifugal push is given to the surrounding air, causing it to become thinner, almost to a vacuum.

This vacuum is replaced by an upward flow of air through the body and out through the head.

The faster the head revolves, the stronger is the centrifugal force, and accordingly the stronger the pull of the ventilator.

The main bearing is a hardened pivot in a patented oilless bearing.

There are no ball bearings to clog or stick.

Iron units are electric-welded. All units are equipped with patented oilless bearings, guaranteed to be trouble-free for at least 10 years.

Sizes 8 in. through 12 in. carry three forged braces to support the head.

Sizes 14 in. to 48 in. carry four, and have inside propeller fan added.

All sizes 8 in. through 48 in. have strong steel bands inside the body, to give perfect rigidity against high winds.

Methods of Installation

Care should be taken not to install the Uno in any pocket under a ridge, or behind any obstruction.

Place the Uno high enough to get the breeze from every direction.

No lubrication whatever is needed at any time.

Uno Ventilators should be set plumb vertical and then absolute satisfaction is assured.

It is well to build condensation gutters into all ventilation bases which support Unos, since hot humid air striking a cold ventilator causes moisture. These gutters should have vents opening out over the supporting sills.

Standard Specifications for Uno Ventilators

The roof ventilators shall be Uno Turbine Rotary Ventilators of the standard construction of the UNO VENTILATOR COMPANY, in sizes as shown in plans. All ventilators shall be of standard weights of galvanized iron (or copper) as used by the UNO VENTILATOR COMPANY. All metal bases supporting Uno Ventilators shall incorporate drip gutters to carry off condensation.

LIST PRICES, WEIGHTS AND EXHAUSTIVE CAPACITIES

Diam. Body in.	List price		Exhaustive cap. (cu. ft.) per hr.		Approximate weight packed, lb.
	Gal. iron, painted	Copper	4 mile breeze	8 mile breeze	
4	$ 7.20	$ 10.80	8,000	10,000	12
6	7.80	11.70	10,400	14,100	14
7	8.10	12.15	13,500	17,400	16
8	9.00	13.50	16,800	20,500	25
9	10.50	15.75	22,400	28,300	27
10	12.00	18.00	26,500	32,500	30
12	14.70	22.05	39,000	47,000	33
14	20.40	30.60	41,000	48,100	45
15	23.10	34.65	52,500	67,500	48
16	30.00	45.00	60,000	72,000	50
18	48.00	72.00	87,000	103,000	75
20	58.00	87.00	105,100	125,600	90
21	63.00	94.50	115,000	128,000	100
24	81.00	121.50	151,000	187,000	120
30	120.00	180.00	225,000	272,000	250
36	150.00	225.00	285,000	332,000	415
42	190.00	285.00	324,000	414,000	500
48	220.00	330.00	365,000	475,000	650

ESTABLISHED 1880

LIONEL VALLAS

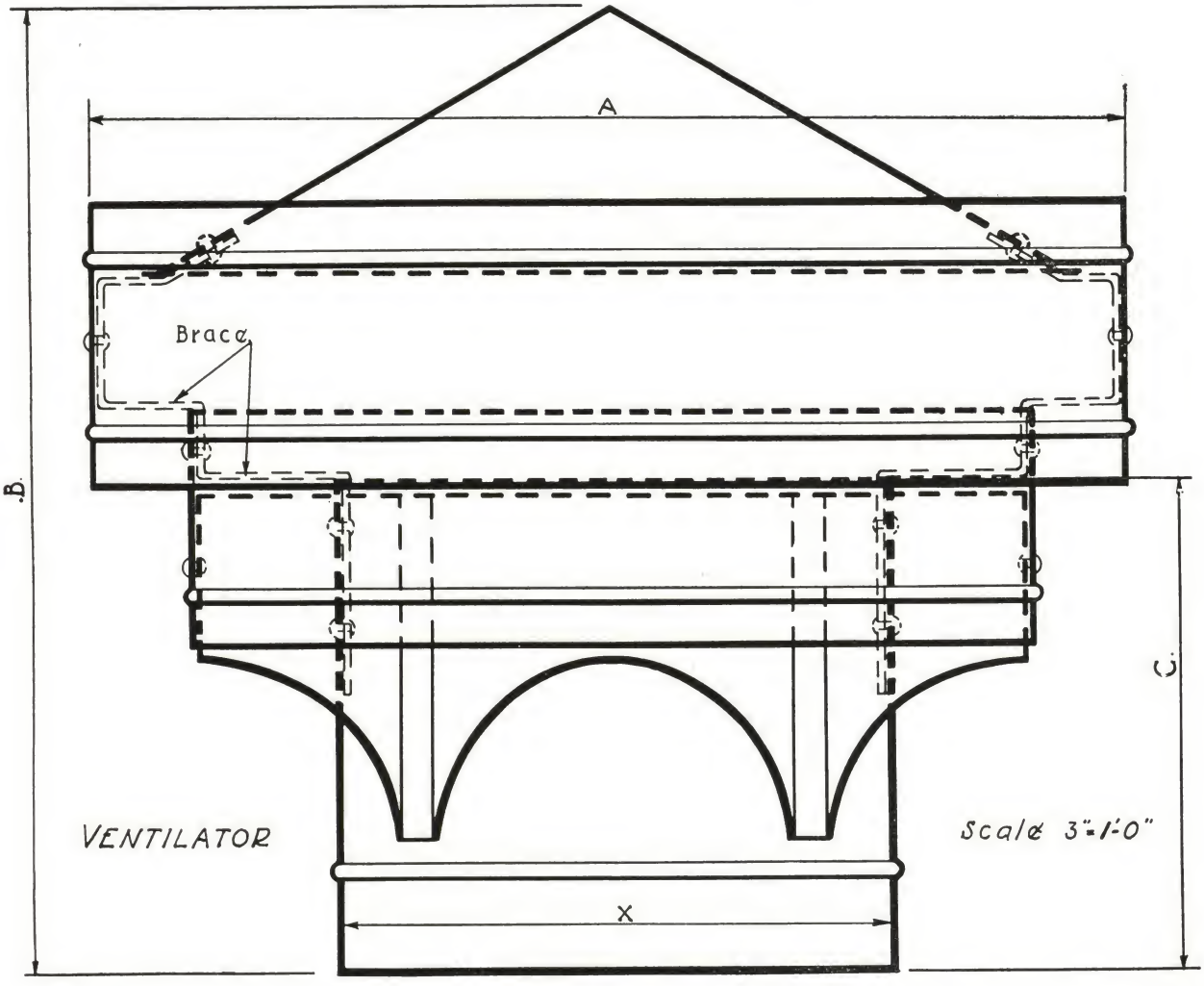
Manufacturers of Sheet Metal Products

2846-50 West Lake Street, CHICAGO, ILL.

See Manufacturers' Index for our Hollow Metal Windows and Doors, Roof Flashing and Skylights

LIONEL SYPHON TYPE VENTILATOR

The Lionel Syphon Ventilator is the product derived from 50 years of constant experimenting with syphonage principles. By actual tests in our shop and in the field, under all different conditions that exist in theatres, factories, schools and offices it has proved itself most efficient.

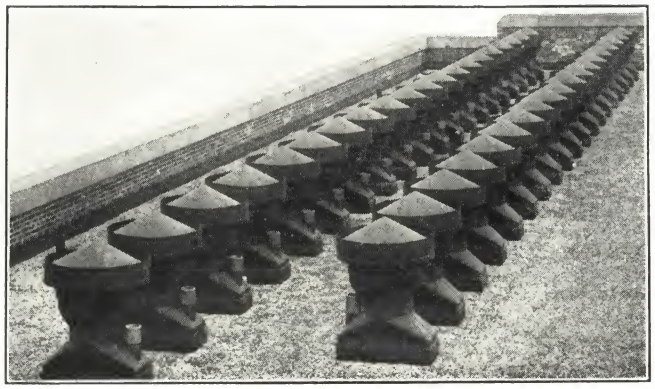


Sizes and Materials

Lionel Ventilators are furnished in any size with or without base or damper and made of any materials desired, such as galvanized iron, copper, aluminum, zinc, monel metal, etc.

Note

We recommend that you call at our office for an anemometer test or write for capacity information.



Typical Installation

An opportunity to estimate your work will be given prompt and careful attention.

PROPORTION SCHEDULE

X . . in.	12	14	16	18	20	24
A . . in.	22⅛	26	30	34	37¾	45
B . . in.	20½	23½	25¾	30¾	35½	39¾
C . . in.	8 7/16	11½	11¾	14¾	17¾	19

ESTABLISHED 1873

E. VAN NOORDEN COMPANY

Roof Ventilators

TELEPHONE
Highlands 3040, 3041, 3042

100 Magazine Street, near Massachusetts Avenue
BOSTON, MASS.

Products

VAN NOORDEN VANCO-SYPHON VENTILATORS.
VANCO STEEL DOOR BUCK.

For our page on "Anchor-Bar" Rolled Steel Puttyless Skylights, see Manufacturers' Index.

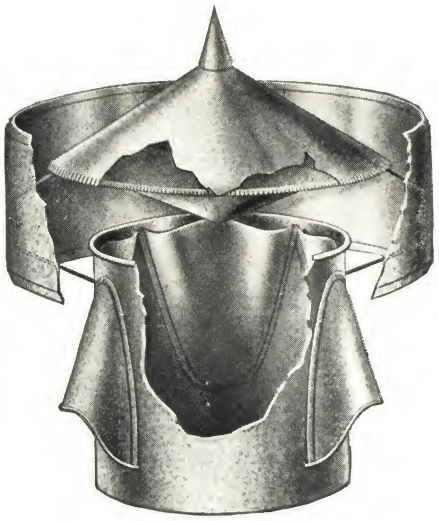
Van Noorden Vanco-Syphon Ventilator (Patent Applied for)

The Van Noorden Vanco-Syphon Ventilator is a stationary type roof ventilator. It has an inner cone at the head and a group of scientifically designed syphons around the upper part of shaft. Air currents striking the shaft are sucked into the syphons, and due to the diminishing area of same are compressed so that a rapid syphonage is created. These currents do not enter the shaft. Their movement is up and out, causing a powerful acceleration around the mouth of the shaft. Other currents striking the flaring surface of the inner cone, are similarly compressed and cause an updraft in the center of the shaft.

The Vanco-Syphon Ventilator is stormproof and is equipped with a hinged damper.

Bases — Bases are provided with ventilators only when so required and stated.

Material — Made of sheet copper or genuine galvanized rust-resisting iron.



*CAPACITIES

Size, in.	Cu. ft. exhaust per hr.	Size, in.	Cu. ft. exhaust per hr.	Size, in.	Cu. ft. exhaust per hr.
12	28,121	18	66,810	36	249,118
14	38,405	24	111,215	48	436,170
16	49,062	30	163,421	..	.....

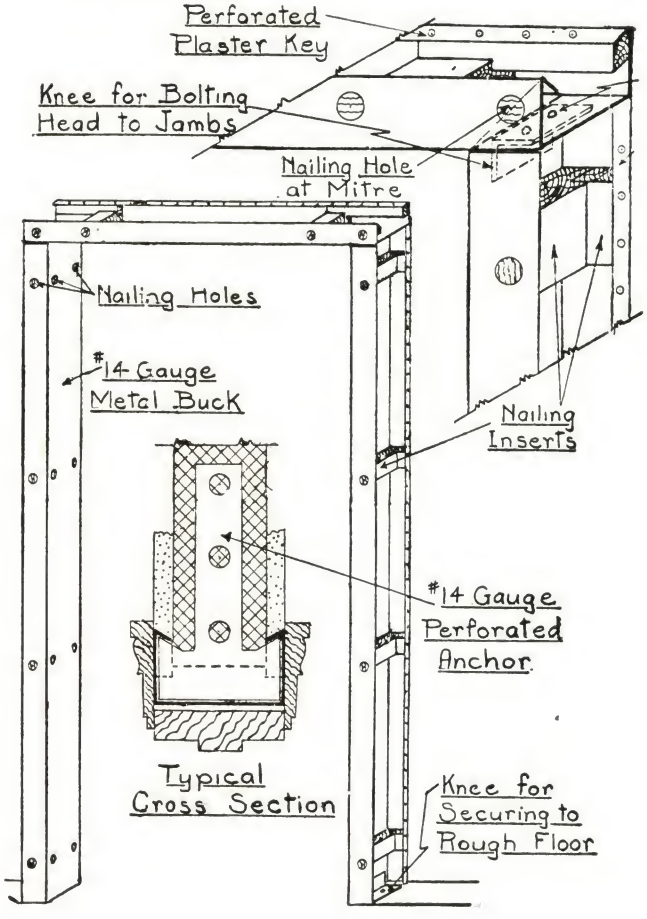
*Based on an average wind velocity of 5 miles per hour.

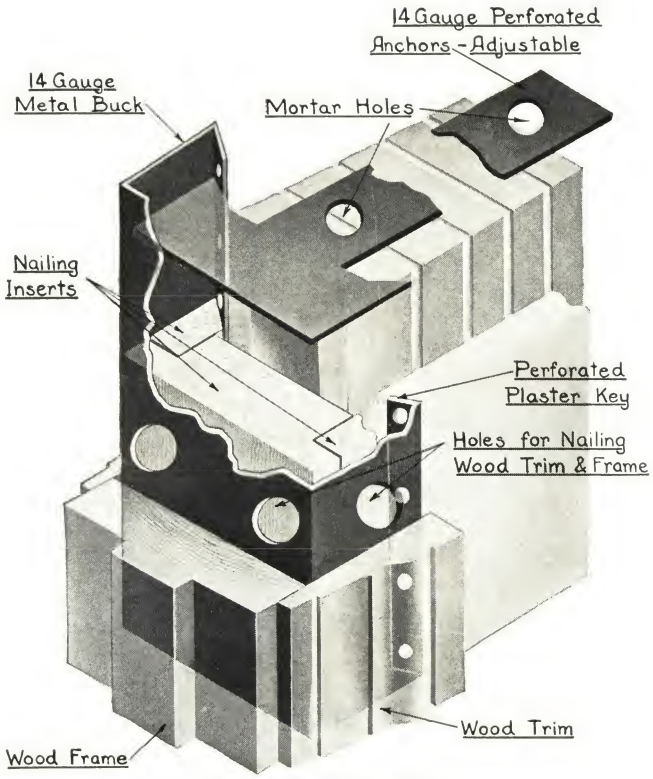
Vanco Steel Nail-To Buck (Patent Applied for)

These new, time-saving steel bucks can be handled exactly as though they were wooden bucks. Wood frames and trim can be nailed in the same manner as to wood bucks. No drilling, tapping or bolting necessary. No shimming of trim.

Another feature is the movable lock anchors and perforated plaster flanges.

They do away with loose frames and wavy plaster lines and, what is very important, they minimize erection labor.





Vanco Steel Door Buck
The buck you can nail to

WESTERN ROTARY VENTILATOR CO., INC.

936 Collingwood Avenue
DETROIT, MICH.

1722 East 14th Street
LOS ANGELES, CALIF.

DISTRIBUTERS

DALLAS, TEX., New Process Roofing & Supply Co., 802 Cadiz Street
DENVER, COLO., W. H. Dawson Company, 850 Santa Fe Drive
HOUSTON, TEX., Houston Blow Pipe & Sheet Metal Company
KANSAS CITY, MO., Western Engineering Sales Co., 3031 Main Street
LITTLE ROCK, ARK., J. T. Hornibrook, 115 East Second Street
NEW ORLEANS, LA., National Blow Pipe & Manufacturing Co.
OMAHA, NEB., Olsen Brothers, 2612 Leavenworth Street
PORTLAND, ORE., Ray F. Becker Company, Inc., 144 Page Street
ST. LOUIS, MO., National Metal Products Co., 6319 Olive Boulevard
SAN FRANCISCO, CAL., Cookson-Cromwell Co., 361 Brannan Street
SEATTLE, WASH., Puget Sound Sheet Metal Works, 3631 Marginal Way
VANCOUVER, B. C., Western Steel Products Corporation

Products

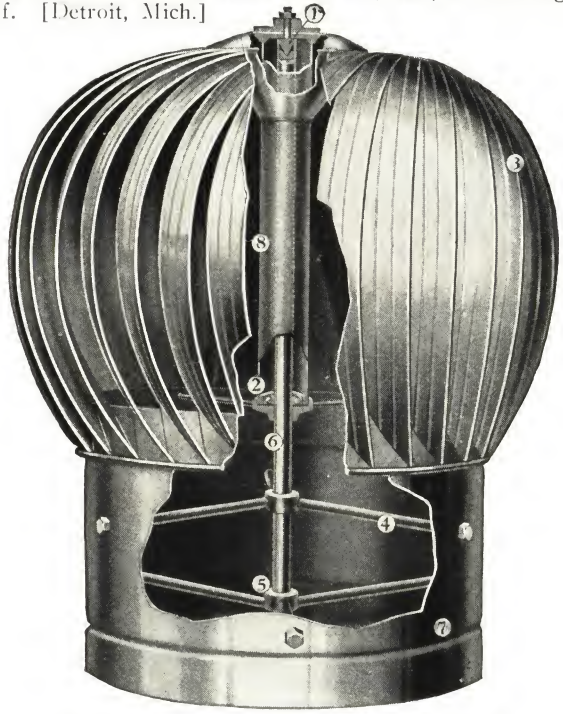
Western Rotary Ball Bearing Ventilators

Designed primarily to give the entire construction industry a multivane turbine ventilator that is efficient at a very low wind velocity, symmetrical in design, absolutely silent in operation, and at a very reasonable cost.

Note in the illustration the simplified, compact bearing suspension of the Western Rotary. The multivane turbine revolves around a central support-shaft upon almost frictionless bearings, floating in a bath of oil and graphite and absolutely sealed against dust, dirt, steam and smoke.

The Western Rotary is in reality an exhaust fan which derives its power from wind at even two miles an hour. This creates a centrifugal action through its turbine construction, forcing a steady circulation and aiding natural action by the mechanical lift of this revolving head. Thus a maximum degree of venting efficiency is produced.

Specify—The Western Rotary Ventilator as manufactured by the Western Rotary Ventilator Co., Inc., of Los Angeles, Calif. [Detroit, Mich.]



Forbes Syphonaire Ventilators

The Forbes Syphonaire Ventilator was designed and developed after many years of experimental work by Western Rotary engineers. It was our desire to manufacture for the building trade a stationary ventilator as a worthy companion to the famous Western Rotary. In the Forbes Syphonaire we know we have a stationary ventilator that is second to none and at a price well within many ventilators of similar design and efficiency.

Note in the illustration the extremely simple and sturdy construction of this product. The system of concave louvres or syphons directly below the storm band are so arranged that no less than three are facing the wind at one time. They catch or pocket the wind, forcing it up and past the ventilating stack creating a positive syphonage. The top plate is small with a louvre directly below which brings friction down to a minimum and at the same time makes this head positively stormproof. The over-all headsize permits a 50% expansion of air before leaving the ventilator. Maximum efficiency is the result.

Specify—The Forbes Syphonaire Ventilator as manufactured by the Western Rotary Ventilator Co., Los Angeles, Calif. [Detroit, Mich.]

DIMENSIONS, GAUGES, WEIGHTS WESTERN ROTARY

Stock sizes, in.	Height, in.	Gauge of iron	Air displacement cu. ft. per hour 4 mi. velocity	Weights, lb.	
				Net	Crated
6	12	26	14,360	7	12
8	12	26	17,400	9	15
10	15	26	26,100	12	20
12	18	26	38,300	17	26
14	22	24	43,200	25	35
16	24	24	50,000	30	45
18	28	24	76,310	35	53
20	31	24	109,200	42	63
24	36	24	149,000	70	105
30	42	24	230,000	94	150
36	52	22	310,000	161	210
42	62	20	420,000	200	250

Note: Prices and discounts on application.

DIMENSIONS, GAUGES, WEIGHTS FORBES SYPHONAIRE

Stock sizes, in.	Height, in.	Gauge of iron	Air displacement cu. ft. per hour 4 mi. velocity	Approx. wt., lb.	
				Net	Crated
8	12	26	10,440	10	16
10	15	26	15,660	15	23
12	18	26	22,980	20	29
14	21	24	25,920	25	35
16	24	24	30,000	37	52
18	27	24	46,586	45	63
20	30	24	65,520	52	74
24	36	24	89,400	70	105
30	45	22	138,000	100	150
36	54	22	186,000	150	225
42	63	20	240,000	200	275
48	72	20	410,000	275	400

Note: Prices and discounts on application.

AMERICAN SHEET METAL WORKS

MANUFACTURERS OF

Hoal's Leakproof Louver

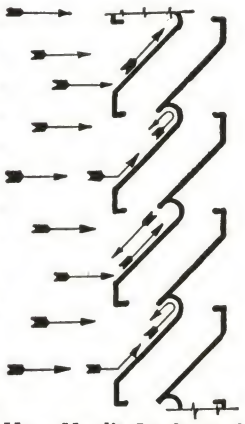
TELEPHONE
Galvez 3191

NEW ORLEANS, LA.

Hoal's Leakproof Louver

A louver that really keeps out the rain and, at the same time, gives proper ventilation, has been a dire need in building construction for many years. This need is now fully taken care of with Hoal's Leakproof Louver.

A moment's examination of the diagram at the left will explain the working principle of Hoal's Louver and show how it checkmates the rain perfectly. The arrows show how the rain is driven against the louver, how it is caught and turned back to drain off the outside of the building. Like many other revolutionary devices, Hoal's Louver is as simple as it is efficient.



How Hoal's Leakproof Louver Checkmates Rain

Construction

Hoal's Louver is made of copper, galvanized iron, aluminum, monel metal or any other sheet metal desired. It is constructed in a rigid manner and is properly braced to withstand wind pressures of the severest kind. Buildings equipped with Hoal's Louvers can never be damaged even in the severest of rain or snow storms.

Stock Louvers

While Hoal's Louver is made to order in any size and architectural design such as Gothic, circular, etc., a large stock of square-top louvers are carried in the following standard widths and heights:

STOCK SIZES OF SQUARE TOP LOUVERS IN FT.-IN.

Width	1–6	2–0	2–6	3–0	3–6	4–0	4–6	5–0	5–6	6–0
Height	1–6	2–0	2–6	3–0	3–6	4–0	4–6	5–0		

By using the stock louvers wherever possible you assure prompt delivery and the cost is naturally less, because they are made on a production basis.

Stock louvers are made only in 26 gauge copper bearing, galvanized steel, and 16-oz. cold rolled copper.

Adaptability

The Hoal Louver is suitable for any purpose and any type of building construction where a leakproof louver is needed.

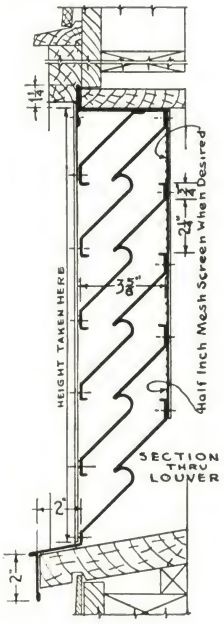
Illustrations at the right show the louver in a weatherboard finished frame wall, and also in a brick wall.

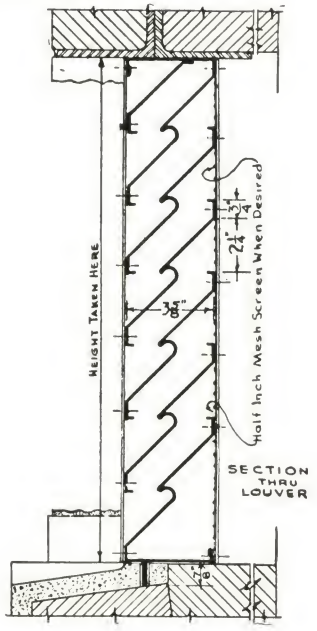
Prices

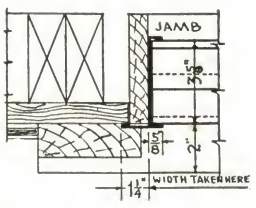
The prices of Hoal's Leakproof Louvers are remarkably low. In fact, we can supply the stock louver, made of copper bearing, galvanized steel, at a price equal to the wood or ordinary metal louver. Sizes other than those carried in stock at a slightly increased cost.

Engineering Service

Our Engineering Department is at your service in offering suggestions and in solving your problems of adapting louvers to any type of construction desired.

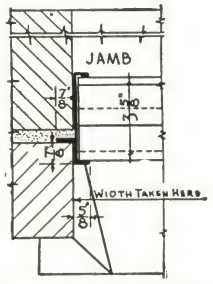






Type H—Frame Wall
Weatherboard finish

Scale:
1½″ = 1′ 0″



Type E—Brick Wall

AREX COMPANY

TELEPHONE
State 2772

28th Floor, 333 North Michigan Avenue Building
CHICAGO, ILL.

ESTABLISHED 1906

Product

"ARIN" ORIGINAL ACCELERANT LOUVERS.

For our pages on Ventilators, see Manufacturers' Index.

"Arin" Original Accelerant Louver

The AREX COMPANY, manufacturers of the Arex original siphonage roof ventilator, with many years of experience in natural gravity exhaust ventilation, in order to render their many clients a most complete service in the solution of their many difficult ventilating problems, have come to realize the importance and need for a device of highest efficiency and best possible construction providing at all times the proper amount of air supply.

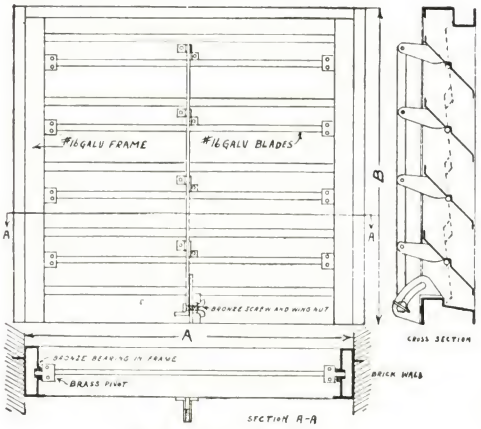
Special attention of architects and engineers is, therefore, called to the Arin Original Accelerant Louver as designed and perfected by Arex engineers and fully described and illustrated on this page. This louver, like all other Arex products, carries with it the same guarantee as to quality of material and workmanship plus assurance of dependable service and reliable performance at all times.

Engineering Service

Our Engineering Department is at your service to solve your ventilating problems with expert analysis and sound recommendations, free of charge—submit blueprint.

Adaptability

These high grade louvers are installed to insure adequate fresh air supply in connection with any heating and ventilating system, in schools, factories, power plants, public buildings, transformer vaults, etc.



Construction Features

"Arin" Adjustable Louver Monitor Skylight

STOCK SIZES

Width, in.	Height, in.	Width, in.	Height, in.
12	12	30	36
12	18	36	18
18	12	36	24
18	18	36	30
18	24	36	36
18	30	36	42
18	36	36	48
24	12	42	24
24	18	42	30
24	24	42	36
24	30	48	24
24	36	48	36
30	18	48	48
30	24	60	24
30	48	60	36

Advantages

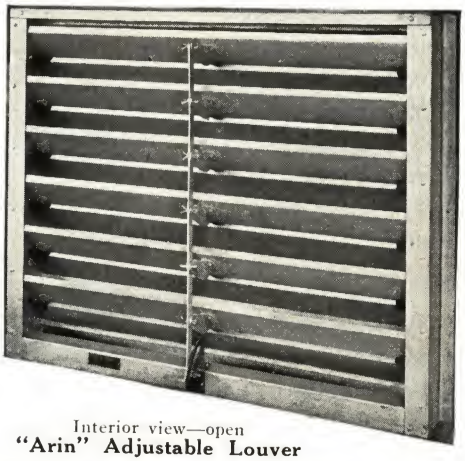
(1) Easy to operate—no sticking. (2) Absolutely foolproof. Practically indestructible. (3) Absolutely stormproof and weatherproof. (4) Blades do not protrude when louver is open. (5) Can be installed in series of two or more units to fit any size opening. (6) Blades can be removed entirely in case of emergency. (7) Furnished with birdscreen if required. (8) Reasonably priced, considering the high grade material and workmanship. (9) Also made of cold rolled copper or any other special material. (10) Frame and blades made of No. 16 gauge galvanized steel. Can be furnished in any special size in gauges up to No. 10.

Construction Features

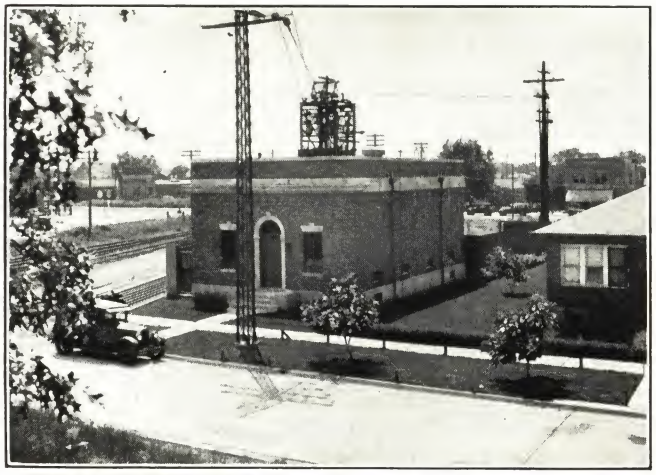
(1) Bronze bearings in frame. (2) Bronze pivots in blades. (3) Bronze setscrews and slide. (4) Adjustable device to lock in any position. (5) Standard depth 4 in. for any brick or concrete wall. (6) Perfectly balanced. (7) Furnished with friction control for installation at roof line or at other high locations so as to be operated from below by means of a pole or chain. (8) If louvers are to be operated by thermostatic control, they can be furnished with ball-bearing blades and the necessary lever connections. (9) Can be furnished with fusible link so as to close automatically in case of fire. (10) Plain stationary type without adjustment can be furnished.

Specifications

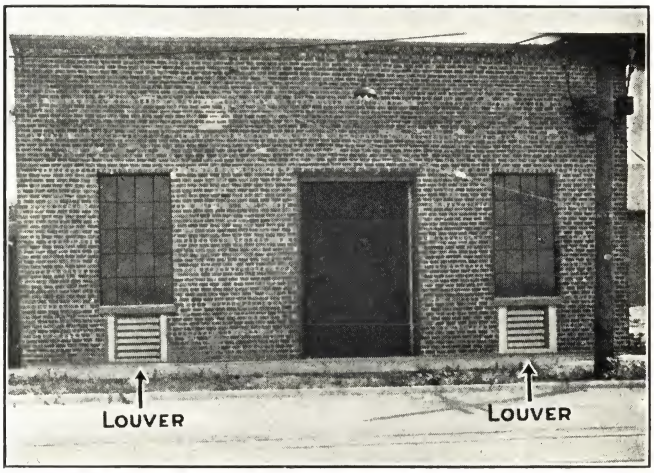
All louvers to be Arin Accelerant Louvers as manufactured by AREX COMPANY, 2815—333 North Michigan Avenue Building, Chicago, Ill.



Interior view—open
"Arin" Adjustable Louver



"Arin" Original Accelerant Louvers Installed in Power Substation



"Arin" Original Accelerant Louvers Installed in Factory

BENJAMIN RIESNER

Manufacturer of the Riesner Ventilating Brick

TELEPHONE
BUtterfield 8-8580

353 East 78th Street
NEW YORK, N. Y.

Riesner Ventilating Brick

The Riesner Ventilating Brick is a hollow metal ventilating device which extends *through* the wall. It is the shape and size of one or two standard bricks and is constructed with a louvered face with waterdrip at top and bottom.

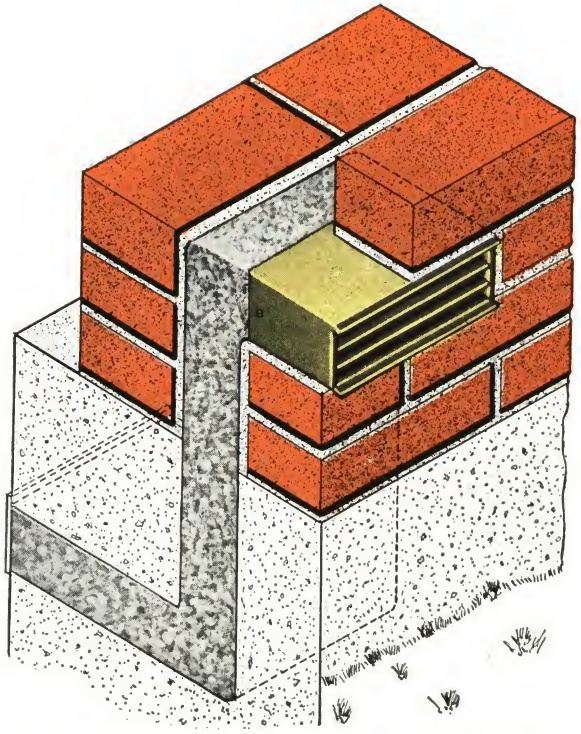
Where Used

Riesner Ventilating Bricks are suitable for ventilating:

Air spaces
Kitchens
Kitchenettes
Closets
Garbage receivers
Hung ceilings
Transformer rooms
Cellars
Cellar rooms
Cold rooms
Attics
Tunnels
Mausoleums
Utility rooms
Vents from oil storage tanks
Gas range hoods

How Installed

The Riesner Ventilating Bricks are "bricked in" by the mason when building up the wall, at a point 6 ins. below the ceiling, with the louvered face to the outer air and duct or flue in the room.



Type "B" with Duct to Ventilate Under Buildings and Special Rooms in Cellars

Type "D" can also be used where more ventilation is required

Construction, Types and Sizes

Riesner Ventilating Bricks are made of cast iron, or cast bronze, with galvanized iron or copper pipe or duct. They extend clear through the wall from the louvered face at the outside, to the brass flange or register face at the inside of the wall.

Made in four types as follows:

Type "A"—This type is the width and height of *one* standard brick (2¼x8 ins.) and transforms into a 3-in. diameter pipe which finishes with a brass flange at the inside of the wall.

Type "B"—Also the width and height of one standard brick (2¼x8 ins.) extends through the wall with a 2x8-in. duct and finishes with a 3x8¼ in. register face at the inside of the wall.

Type "C"—The width of *one* brick and the height of *two* bricks (4¾x8 ins.) and transforms into a 6-in. diameter pipe which finishes with a brass flange at inside of the wall.

Type "D"—The width of *one* brick and the height of *two* bricks (4¾x8 ins.) Type "D" extends through the wall with a 4½x8-in. duct and finishes with a 5⅞x9¼-in. register face at the inside of the wall.

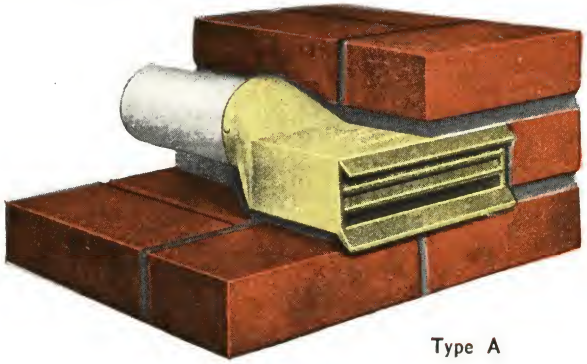
Further Details—Types "B," "C" and "D" are furnished with bronze insect screen to prevent flies and insects from coming into the ventilated areas.

Ventilating bricks are carried in stock for 12-in. walls and measure 13 ins. from exterior louvered face to pipe flange or register face at inside of wall. They can, however, be made up for 8-in. walls or any other wall thickness required.

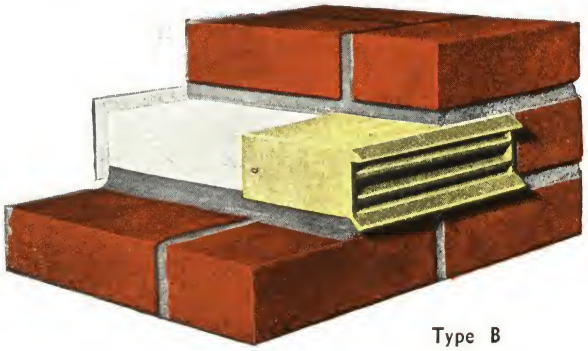
Ventilating bricks can also be made up with elbows for ducts to meet special conditions.

Color

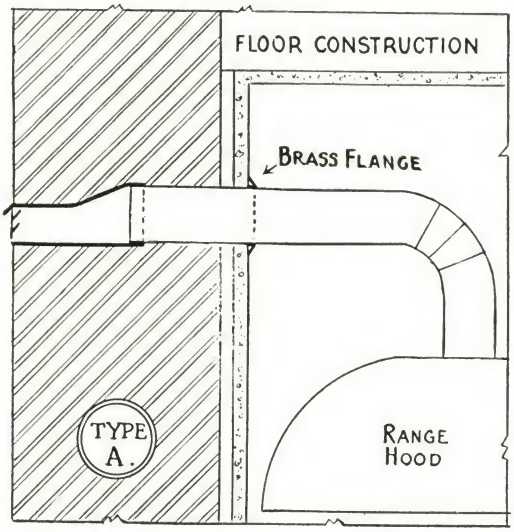
Cast iron ventilating bricks are painted a buff color.

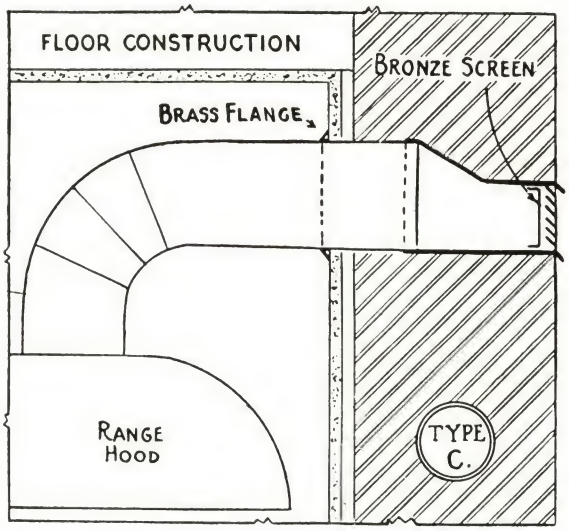


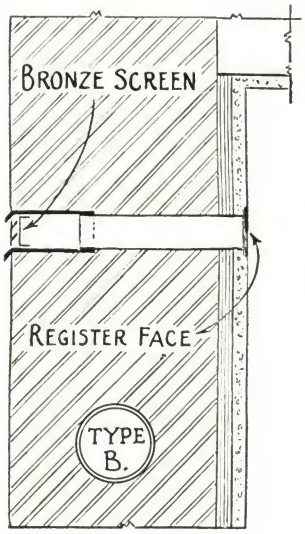
Type A



Type B







Advantages

Riesner Ventilating Bricks do not take up any extra space. *They are bricked into and become a part of the wall.*

Ventilating bricks can be built into frame construction, brick walls and concrete forms.

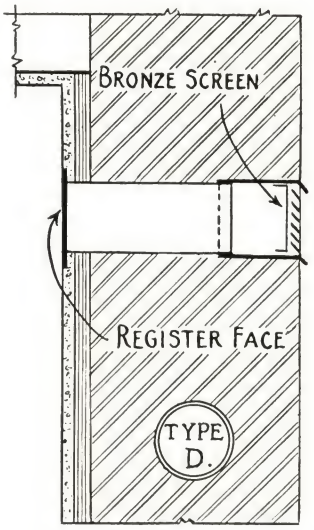
They are used to ventilate air spaces under buildings and special rooms in cellars and attics and can be furnished with elbows and offsets where the area to be ventilated is below grade.

Types "A" and "C" can readily be connected to gas range hoods. Ventilating bricks are particularly useful in kitchens where there is no room for vertical vent shafts. *They constantly ventilate and remove gas fumes, steam and cooking odors from the room.*

Types "B" and "D" are designed to meet general ventilating requirements for cellars, air spaces and attics, etc., to allow a circulation of air and prevent dry rot.

Ventilating bricks prevent discoloration of the walls and obviate the necessity of frequent repainting.

They are designed to be absolutely weatherproof, and economical because they do not deteriorate—the first cost is the *only* cost.



Prices, Cast Iron, for 12-in. Walls

Type "A" with a brass wall flange.....$ 5.50 each
Type "B" with 3x8¼-in. register face..... 6.50 each
Type "C" with a brass wall flange..... 11.50 each
Type "D" with 5⅞x9¼-in. register..... 12.50 each

Type "D" can be supplied with sliding damper at $1.00 additional.

Cast bronze prices on application.

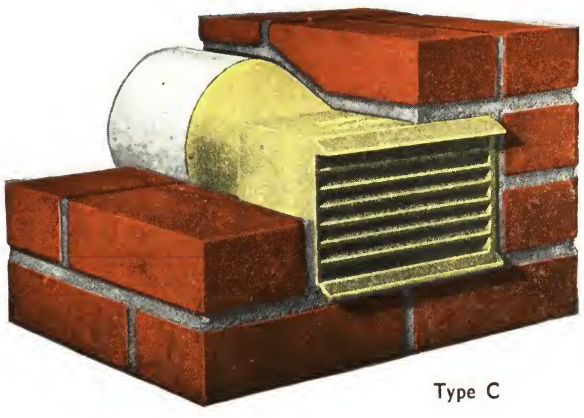
All prices net, f.o.b. New York, N. Y.

Estimates furnished promptly for special duct and elbow work.

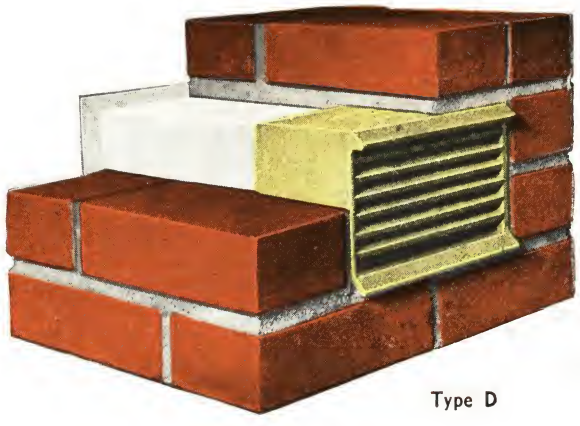
Specifications

Specify under masonry heading:

Install Ventilating Bricks as manufactured by BENJAMIN RIESNER, 353 East 78th Street, New York, N. Y., in the walls 6 ins. below finished ceiling. (Specify type, location and whether cast iron or bronze.)



Type C



Type D

VICTOR VENT COMPANY

Correct Ventilation for Underneath Buildings

ANDERSON, S. C.

Products

The Victor Vent.
The Dixie Vent.

Foreword

Correct building ventilation will protect buildings against dry-rot. Ernest G. Blake, M.R.S.I., noted authority on timber, sums up dry-rot as follows: "One of the greatest enemies of timber . . . a highly infectious fungoid disease caused by the action of a vegetable parasite operating under suitable conditions . . . the four conditions necessary for germination and development are dampness, stagnant air, warmth and darkness."

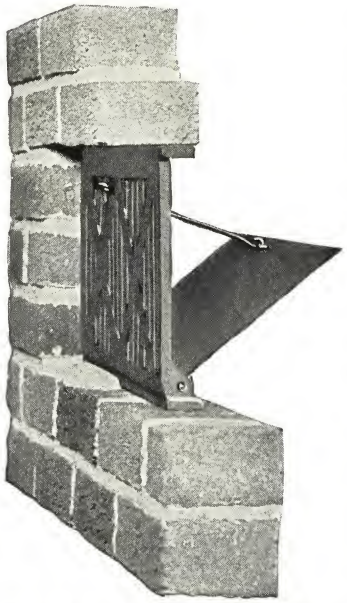
Victor Vent

The Victor Vent is a complete unit offering building ventilation with safety—safety from the ravages of dry-rot, rodents, reptiles and insects.

Construction—The Victor Vent is neatly and strongly made of cast iron—a single casting, 9x16 in. over all, with an arch bar over an inch in width to provide sturdy support for brickwork above. The vent face is divided into two parts, each side carrying six ½-in. bars, spaced ½ in. apart, and reinforced with cross bars on each side, adding extreme reinforcement and lending ornament to design. All vents are dipped in black paint.

Protection against reptiles, rodents and larger insects is afforded to buildings equipped with the Victor Vent by a non-rust hardware screen riveted to the back of the vent with copper rivets.

Operation—The novel feature of the Victor Vent is the shutter. Operating on a rolled hinge and made of sheet iron, the shutter is hinged to the bottom of the casting and attached to a push rod which extends through the frame. Ample ventilation is afforded by pushing in rod which causes the shutter to fall back. The shutter may be closed from the outside by simply pulling out the push rod and allowing it to hang down, its leverage and weight providing an efficient fastener.



Showing Method of Victor Vent Installation in Brick Wall

Installation—The Victor Vent has been designed for neat and speedy installation. No unsightly seams, joints or cracks mar the appearance of your brick wall when installed. The top arch bar and two bottom lugs extending from the frame are the same thickness as the mortar joint. They are over an inch in width, of very strong construction and will support all necessary brickwork above.

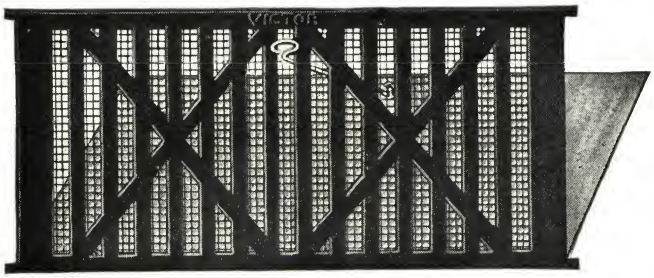
The width and height of the ventilator frame have been carefully calculated by a practical architect and will permit its insertion into new buildings without any unnecessary brickwork.

Specification for the Victor Vent

All ventilators used below buildings shall be Victor Vents of the standard construction of the Victor Vent Company, Anderson, S. C.

Dixie Vent

The Dixie Vent is built along the same practical lines of the Victor. Made of cast iron in one piece with arch bar extended from mortar joint insertion. Has all the advantages of the ventilator described above, except the shutter and wire-mesh guard.



Victor Vent with Non-rust Screen and Shutter

Dixie Vent without Shutter and Wire Mesh Guard

STEEL AND IRON CONSTRUCTION

◆ ◆ ◆

MISCELLANEOUS STEEL AND IRON

BETHLEHEM STEEL COMPANY

BETHLEHEM, PA.

DISTRICT OFFICES

NEW YORK, BOSTON, PHILADELPHIA, BALTIMORE, WASHINGTON, D. C., ATLANTA, PITTSBURGH, BUFFALO, CLEVELAND, CINCINNATI, DETROIT, CHICAGO, ST. LOUIS, HOUSTON

PACIFIC COAST DISTRIBUTOR: Pacific Coast Steel Corporation, San Francisco, Los Angeles, Seattle, Portland and Honolulu

EXPORT DISTRIBUTOR: Bethlehem Steel Export Corporation, 25 Broadway, New York, N. Y.

Products

BETHLEHEM WIDE-FLANGE STRUCTURAL SECTIONS, including GIRDER BEAMS, I-BEAMS and H-COLUMNS; BETHLEHEM JOISTS and STANCHIONS.

Uses

Bethlehem Girder Beams and I-beams are used in buildings, short-span bridges and as bridge floor beams; H-columns, in all sizes of buildings and bridges. Joists are used especially for floor construction in buildings designed for lighter floor loads; also in the roof construction of all types of buildings. Stanchions are used as columns or posts in connection with Bethlehem Joists and other structural shapes.

Advantages

Bethlehem Wide-Flange Structural Sections are rolled on Bethlehem's Patented Grey Mills. These sections combine the advantages of economy in weight and cost of fabrication.

PROPERTIES OF BETHLEHEM SECTIONS

*Section No.	Weight per ft., lb.	Section modulus, in.³
G36 36″x16½″	300	1103.6
	280	1030.8
	260	949.5
	250	911.2
	240	872.0
	230	833.9
B36 36″x12″	192	662.0
	176	601.5
	167	568.7
	158	537.0
	150	507.5
G33 33″x15¾″	260	881.3
	240	810.5
	220	740.0
	210	703.2
	200	669.0
B33 33″x11½″	152	485.7
	141	446.2
	132	413.0
	125	384.4
G30 30″x15″	240	742.3
	220	679.8
	200	617.0
	190	584.8
	180	554.7
B30 30″x10½″	131	378.7
	122	347.7
	115	326.3
	108	305.0
G28 28″x14¼″	175	499.7
	166	473.2
	156	446.1
	145	416.0
B28 28″x10″	112	306.4
	104	284.7
	97	265.1
	91	246.9
	85	222.1
G26 26″x14″	171	466.1
	157	427.9
	145	392.2
B26 26″x9½″	101	257.4
	91	230.8
	85	214.1
G24a 24″x14″	160	412.0
	150	384.3
	140	357.3
	130	329.3
G24 24″x12″	120	298.9
	110	273.8
	100	248.5
B24a 24″x10″	93	224.0
	85	204.3
B24 24″x9″	81	189.8
	74	173.8
	70	161.2
G22 22″x13″	116	270.2
	108	251.5
	101	233.7
B22a 22″x9¼″	96	209.3
	89	194.2
	83	180.5
	77	167.4
B22 22″x8½″	73	159.6
	67	145.6
	62	132.5
	58	121.6
G20 20″x12″	146	304.7
	135	280.4
	125	258.4
	115	236.5
B20a 20″x9″	98	197.3
	88	176.7
	80	159.5
	74	147.4
B20 20″x8″	65	128.9
	60	117.8
	55	107.2
G18 18″x11¾″	99	193.7
	92	179.8
	86	167.1
	80	154.4
B18a 18″xS3¾″	77	141.7
	70	128.1
	64	116.9
B18 18″x7½″	57	104.5
	52	94.6
	49	89.7
	47	85.4
G16 16″x11½″	90	156.8
	83	144.1
	76	132.3
B16a 16″x8½″	68	113.9
	63	105.0
	58	96.2
B16 16″x7¼″	50	82.3
	45	73.8
	40	65.8
	37	59.1
G15 15″x11″	108	172.0
	99	158.1
	91	144.9
	85	135.1
B15a 15″x7½″	72	109.4
	66	100.0
	60	90.4
	55	83.1
B15 15″x6¾″	49	74.6
	44	66.9
	39	59.6
	35	53.3
H14d 14″x16″	426	707.6
	412	682.1
	398	657.2
	384	632.2
	370	608.3
	356	583.6
	342	559.4
	328	536.0
	314	512.1
	300	488.4
	287	465.5
	273	442.3
	264	427.4
	255	412.0
	246	397.4
	237	382.2
	228	367.8
	219	352.8
H14d 14″x16″	211	339.2
	202	324.9
	193	310.0
	184	296.0
	176	281.9
	167	267.3
	158	253.4
	150	240.4
	142	226.7
H14e	320	492.8
H14 14″x14½″	153	243.0
	145	230.1
	136	216.0
	127	202.0
	119	189.4
	111	176.3
	103	163.6
	95	150.6
	87	138.1
H14a 14″x12″	84	130.9
	78	121.1
H14b 14″x10″	74	112.3
	68	103.0
	61	92.3
H14c 14″x8″	58	85.0
	53	77.8
	48	70.2
	43	62.8
B14 14″x6¾″	42	61.1
	37	54.0
	33	47.8
	30	42.5
H12 12″x12″	190	263.2
	176	242.6
	169	232.6
	161	222.2
	154	211.9
	147	201.8
	140	192.2
	133	182.5
	126	172.6
	120	163.4
	113	153.9
	106	144.5
	99	134.7
	92	125.0
H12 12″x12″	85	115.7
	79	107.1
	72	97.5
	65	88.0
H12a 12″x10″	64	85.9
	58	78.2
	53	70.6
H12b 12″x8″	50	64.7
	45	58.1
	40	52.0
G12 12″x10″	60	79.1
	55	72.1
B12 12″x6½″	36	46.0
	32	40.7
	28	35.6
	25	30.8
BJ12 12″x4″	22	25.3
	19	21.4
	16½	17.5
H10 10″x10″	136	154.4
	130	147.1
	124	139.9
	118	133.1
	112	126.3
	106	119.3
	100	112.4
	95	106.2
	89	99.7
	83	92.9
	77	86.1
	72	80.1
	66	73.7
	60	67.1
	54	60.4
	49	54.6
H10a 10″x8″	45	49.1
	41	44.5
	37	39.8
	33	35.1
G10 10″x9″	45	50.0
	42	46.2
B10 10″x5¾″	29	31.4
	26	27.6
	23	24.1
	21	21.7
BJ10 10″x4″	19	18.8
	17	16.2
	15	13.8
B9 9″x5½″	23	21.8
	20	18.7
H8 8″x8″	67	60.4
	62	56.0
	58	51.9
	53	47.5
	48	43.2
	44	39.4
	40	35.5
	35	31.1
	33	29.3
	31	27.4
H8a 8″x6½″	30	26.0
	27	23.5
	24	21.0
B8 8″x5¼″	21	17.9
	19	15.9
	17	14.0
BJ8 8″x4″	15	11.8
	13	9.88
H6a 6″x10″	88	59.5
	80	53.8
	73	48.9
	67	44.7
	60	40.0
	53	35.1
	46	30.5
	40	26.3
H6 6″x6″	40½	26.9
	30	19.8
	26½	17.5
	23	15.1
	20	13.1
BS6 6″x6″	18	11.7
	15½	10.0
BJ6 6″x4″	16	10.1
	14	8.63
	12	7.24

*Dimensions following section number are nominal over all height and width of flange respectively.

CONCRETE STEEL COMPANY

Havemeyer Steel Joist

2 Park Avenue, NEW YORK, N. Y.

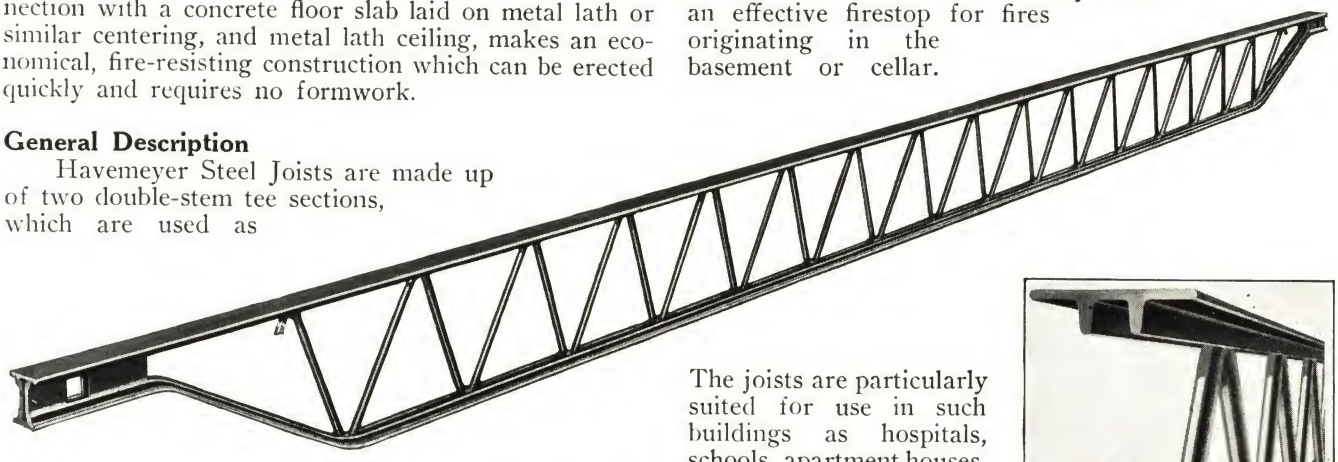
For Sales Offices, Warehouses and Fabricating Works, see our other page
For Havemeyer Concrete Reinforcement Bars, Devices, etc., see Manufacturers' Index

Havemeyer Steel Joist

The Havemeyer Steel Joist is a scientifically designed unit, electrically welded, and when used in connection with a concrete floor slab laid on metal lath or similar centering, and metal lath ceiling, makes an economical, fire-resisting construction which can be erected quickly and requires no formwork.

General Description

Havemeyer Steel Joists are made up of two double-stem tee sections, which are used as



chord members, and a plain round bar used as a web member.

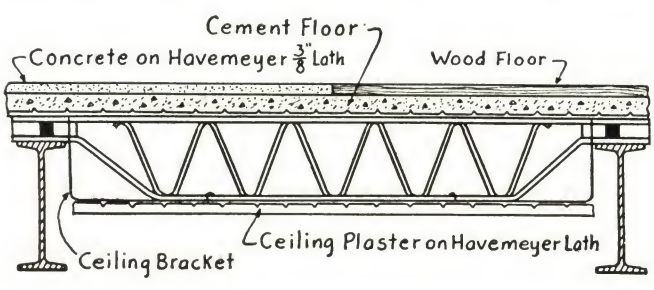
These members are formed in the shape of a standard Warren truss and electrically welded at all intersections. The ends of the joist are connected by welding to flat sections, which provide an opening for anchorage of the joist when used on masonry or concrete walls.

All steel used is of highest quality open hearth structural grade. All welds are carefully made by experienced welders, and a rigid system of inspection and testing insures a uniform product. All joists are given a dip coat of metal protective black paint before shipment.

General Use of Joists

Havemeyer Steel Joists can be used economically on many different types of buildings. Where a building is erected of structural steel columns and girders, joists are used for supporting the floor slabs. As these joists are very simple to erect and are placed on top of the beams or girders, no extra fabricating is necessary.

Havemeyer Steel Joists are also used on structural concrete buildings for carrying the floor slabs, the columns and girders being reinforced concrete. They are used on residence work and are particularly recommended for the first floor, even if the house is to be built of wood frame, and when properly put in place in connection with concrete slabs, they form an effective firestop for fires originating in the basement or cellar.



The joists are particularly suited for use in such buildings as hospitals, schools, apartment houses, hotels, institutions, garages, etc., built for light loads.

Havemeyer Steel Joists, with open webs, allow space for running pipes, electrical conduits, etc. This has been found of great advantage in most types of buildings.

Joists are made in standard sizes to fit all spans from 4 to 32 ft.

A metal lath ceiling can be readily attached to the underside of the joist.

Metal Lath and Specialties

In making bids, our estimate usually includes furnishing of joists, rib lath or other specified reinforcing material for the floor slabs, ceiling brackets, anchors, sleeper clips, lath clips, and bridging. Also metal lath for ceilings when it is required.

Where small openings are required in the floor, we furnish headers which are easily attached and form a simple method of providing for these conditions.

Engineering Service

Concrete Steel Company maintains at all its district offices experienced engineers who will be pleased to co-operate with engineers, architects or contractors in planning the uses of Havemeyer Steel Joists. Estimates will be gladly furnished, and where an order is placed with us, complete erection details and full information will be given to the contractor.

Catalogue and Descriptive Literature

Our catalogue and descriptive literature is available to all engineers, architects, builders and owners, and will be cheerfully sent on request.

FOUNDED 1850

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS

Jones & Laughlin Building, PITTSBURGH, PA.

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Telephone, Garfield 4075
SAN FRANCISCO, CAL., Standard Oil Building
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TORONTO, ONT., CANADA, Toronto Daily Star Building
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Products

J & L Junior Beams.

Also J & L Structural Shapes and Fabricated Structural Work, Columns, Girders, Trusses, Plate Work, Tanks, Mill and Factory Buildings; J & L Steel Piling; J & L Wire Products.

For J & L Bars for Concrete Reinforcement, Light Weight Channels for Stair Stringers and other uses, and Tubular Products, see Manufacturers' Index.

J&L JUNIOR BEAMS

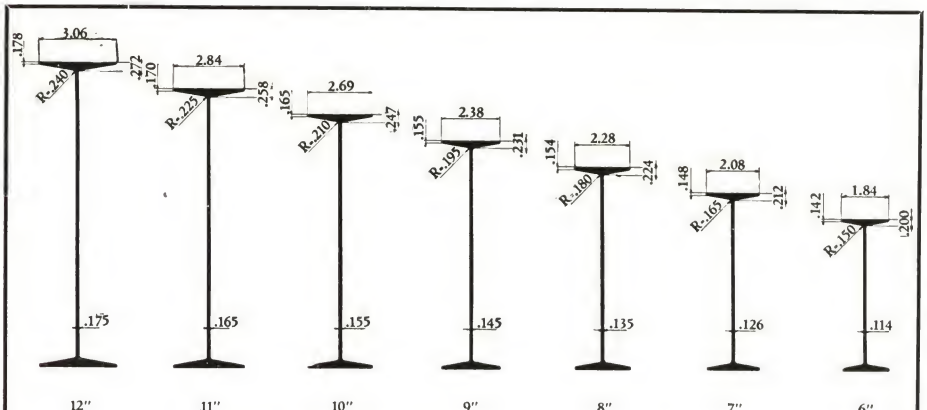
Junior Beams—Description

The J & L Junior Beam is one of the lightest rolled structural I-beams now available and provides the building industry with sections which make possible new economies in practically all types of construction.

The Junior Beam is made from structural grade, copper-bearing steel rolled from the billet to the full I-section in a continuous mill with but slight change in temperature from the reheating furnace to the cooling bed.

The process by which it is possible to obtain a section having the dimensions of the Junior Beam combined with its very light weight, is the result of advanced engineering and mill practice. There is no warping during cooling and tests show that the entire structure of the Junior Beam is comparatively free from strains.

Junior Beams are homogeneous steel I-sections in their original symmetrical form as rolled, and, as such, can be used in structural design up to their full value by employing standard engineering formulae and without empirical assumptions.



SIZES, WEIGHTS AND PROPERTIES OF JUNIOR BEAMS

Depth, in.	Weight, lbs. per ft.	Flange width, in.	Web thickness, in.	Area, sq. in.	Radius of gyration		Moment of inertia		Section modulus	
					Hor. axis	Vert. axis	Hor. axis	Vert. axis	Hor. axis	Vert. axis
12	11.8	3.06	0.175	3.45	4.573	0.532	72.21	0.978	12.01	0.638
11	10.3	2.84	.165	3.01	4.200	.498	53.08	.746	9.63	.525
10	9.0	2.69	.155	2.64	3.847	.480	39.01	.608	7.78	.452
9	7.5	2.38	.145	2.20	3.450	.423	26.20	.394	5.81	.332
8	6.5	2.28	.135	1.92	3.116	.423	18.67	.343	4.65	.301
7	5.5	2.08	.126	1.61	2.744	.393	12.13	.248	3.45	.239
6	4.4	1.84	.114	1.30	2.372	.357	7.30	.165	2.42	.179

Rust Resistance

All J & L Junior Beams are rolled of copper-bearing steel, recognized retardant of atmospheric corrosion.

Weathering tests made through many years by the American Society for Testing Materials have shown in general, a surprising resistance of copper-bearing steel to the inroads of atmospheric corrosion. The results have indicated that the addition of copper, even in small proportions, will more than double the useful life of a roofing sheet. Experiments with structural shapes in which the content conforms to standard mill practice for copper-bearing steel have fully confirmed this conclusion.

Corrosion is arrested, and if the surface is painted, the paint adheres and does not flake off

Originators of Junior Beams have been forward-looking in supplying the need for light structural shapes. They have also taken care to make them most durable by adding copper content to the steel in the proportions called for by the American Society of Testing Materials for copper-bearing structural steel.

Official Classification of Junior Beams

Junior Beams are extensively used throughout the United States and Canada in floor systems, the carrying capacity being based on the same fiber stress as that of standard weight structural steel sections. As a result of rigid tests conducted by Professor W. J. Krefeld in the Columbia University Testing Laboratories, Junior Beams were granted structural steel rating in the five boroughs composing New York City. A similar rating was accorded Junior Beams in Boston in consequence of tests conducted by Professor H. W. Hayward of the Massachusetts Institute of Technology.

J & L Junior Beams are rated as structural steel by the American Institute of Steel Construction and their properties and dimensions are included in the handbook of information published by the Institute.

Uses for Junior Beams

The principal use of Junior Beams is as secondary members in floor and roof construction of buildings. They are also being used in increasing quantities as purlins, rafters and girts for mill and hangar buildings, ceiling supports over auditoriums, protection sheds and scaffolding, monorails, supports for conveying and mechanical equipment, and all classes of structural work where, due to their light weight, they are the most economical sections to use.

The adaptability of Junior Beams to floor construction provide many economies due to light weight of floor and ease of erection. A floor containing the least amount of steel, concrete and labor can be designed by judicious combination of companion materials. It is advantageous to utilize in good designs, the actual strength of properly proportioned thin concrete slabs by spacing Junior Beams to their capacity and also where practicable designing the Junior Beams as continuous spans. The floor will be light, rigid, have a minimum amount of deflection, is quickly erected, fire-safe and soundproof. Precast gypsum slabs and other light weight materials are also employed in obtaining similar economies.

In home building, Junior Beams have ushered in an age of fireproof construction of individual dwellings, with an economy which permits their use in houses of moderate cost, as well as in the more pretentious residences. While fireproofing, offering practically complete protection of home, possessions and occupants against danger from fire, is generally the primary reason for Junior Beam floors in residences, there are other important advantages. Such floors are uniformly strong, sound-resisting and free from vibration. They do not settle, warp or shrink; hence there is an absence of unsightly plaster cracks in corners and ceilings, gaps around the base and other defects which lead to expensive repair bills and rapid depreciation. Specific information regarding residence construction can be obtained upon request.

On the page following are shown suggested types of floor design which will meet all building code requirements.

J & L Service

Jones & Laughlin District Sales Offices are located in all important centers. J & L Engineers familiar with J & L Junior Beams and their uses are available in these offices for advice and assistance.

When you desire to have detailed information in connection with the design of J & L Junior Beams, please ask the nearest office for Bulletin which contains all such data. (See addresses and telephone numbers on preceding page.)

The JONES & LAUGHLIN STEEL CORPORATION offers, also the aid of skilled field engineers to service any particular building operation in which Junior Beams are used.

Specifications

Architects and engineers should include Junior Beams in the structural steel section of specifications, as they are an integral part of the structural framework of the building, to be supplied by the structural steel contractor. This procedure insures proper co-ordination of design and detail under one engineering control and also proper timing of arrival of all structural material to the site and erection by the same erector.

The following specifications have been developed with the idea that they will aid designers in properly specifying J & L Junior Beams. Specifications may be used either in whole or in part with absolute confidence; they represent the best thought and standard practice at the present time.

Description—The structural part of the floor system shall consist of the slab supported on Jones & Laughlin Junior Beams, acting as secondary members of dimensions as shown on drawings. Before shipment, all J & L Junior Beams shall be given a coat of oxide paint. Paint with a coal tar base shall not be permitted. (*Note:* If a second coat of paint is to be applied by the erector in the field, mention of it should be made here.)

Partitions—Proper provision shall be made in the loading for the weight of partitions.

LIVE LOADS

	Corridors	Rooms	Loads
First floor			
Second floor			
Intermediate floors			
Roof			

Bridging—The J & L Junior Beam shall be bridged as shown on the drawings with [tension compression] [tie rod] [solid concrete crossbeam] [12½ gauge wire]. Where wire or tie-rod bridging is used, the end Junior Beam in each panel shall be fastened to bridging anchors set in outside wall or to parallel structural steel.

Coping—Where tops of Junior Beams are flush with top of supporting beams, the Junior Beam shall be coped to allow proper framing.

Wall Plates—Plates shall be used under the ends of Junior Beams resting on bearing walls.

Anchors—Where Junior Beams rest on masonry walls, a ½x8-in. round anchor shall be used [in such Junior Beams as the local building code requires] or wall ties ¾x12 in. corrugated and galvanized, laid on lath before concreting and anchored in wall.

Sleepers—Where wood floors on top of concrete slabs attached to sleepers are specified, the sleepers shall be preferably of hardwood, embedded in the slab. Sleepers shall be 2 in. wide by 2 in. deep (or greater depth) nominal dimensions, and shall be attached to the top of Junior Beams by means of proper clips. Sleepers shall run [at right angles to the Junior Beams and be spaced .... in. apart] [diagonally to the Junior Beams]. Substitution may be made for the above, dependent upon the type of floor system under consideration.

Floor Slabs—Concrete floor slabs shall be designed to suit the loading and spacing of Junior Beams. The slab shall be poured on [self-centering lath] [paper-backed fabric] [removable forms]. The concrete shall be composed of one part cement and a graded mixture consisting of not more than seven parts of fine and coarse aggregate. Where the slab is poured on lath, it shall be mixed sufficiently dry to prevent dripping. Where the slab is poured on removable forms, the maximum size of the aggregate shall be ½ in. and the concrete shall be of a consistency which will allow it to encase the beam flanges or flow under the wood sleepers. Where floor slabs of other material than concrete are used, they shall be designed to carry the specified loading in accordance with manufacturer's specifications.

Permanent Centering—(*Note:* For specifications for centering [lath] [paper-backed fabric], the designer should refer to the Junior Beam Bulletin obtainable on request.)

Lath shall be applied with sheets running at right angles to the Junior Beams. Metal lath shall be securely fastened to the tops of the Junior Beams with lath clips on 12-in. centers, except at ends of sheets where lath clips shall be at 6-in. centers, and applied with a special tool furnished by the manufacturers of the J & L Junior Beams. Lath sheets shall be securely wired together along the side laps midway between Junior Beams. Any approved form of metal lath or backed floor fabric may be used. Any and all clips, ties, or other accessories necessary for the proper application of each particular type of centering shall be used in accordance with these specifications or the specifications of the manufacturer of the respective centering materials. The writer of the specifications shall define the type and quality of the centering to meet the particular requirements.

Removable Forms—Either wood or steel forms may be employed, placed so that the compression flange of the Junior Beams will be embedded a minimum of ¼ in. or more. Where a plaster ceiling is not used and appearance is a factor, there should be a minimum of ¾ in. embedment of top flange. Standard practice regarding the use of shoreless forms will obtain.

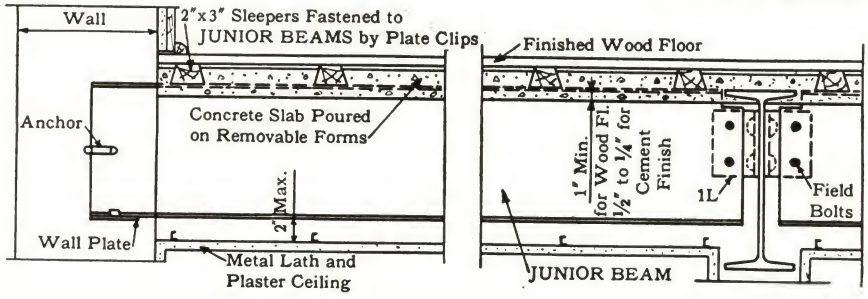
Temperature and Shrinkage Reinforcing—When finished floors are made of composition, terrazzo or materials other than wood, provisions shall be made for proper size of steel reinforcing.

Ceiling Lath—Ceiling lath, covered elsewhere under plastering specifications, shall be firmly wired to [pencil rods] [furring channels] which in turn shall be securely fastened to the bottom flanges of the Junior Beams by means of approved clips. Use of J & L Furring Clip to obtain proper space for conduits is recommended. See Junior Beam Bulletin, which will be furnished on request.

Where the spacings of the Junior Beams are narrow, flat or ribbed lath may be fastened directly, by means of an approved clip, to the lower flanges of the Junior Beams. Ribbed lath shall be applied so that the ribs are at right angles to the direction of the pencil rods, or, when pencil rods are omitted, to the Junior Beams.

Typical Junior Beam Floor with Wood Wearing Surface

This sketch shows a typical Junior Beam floor with a wood wearing surface.



The sleepers are placed directly on top of the Junior Beams and fastened by plate clips.

This does away with expensive leveling and the sleepers cannot move when concrete is poured.

Where the beam spacing is over 39 in., a 2x4-in. sleeper is recommended.

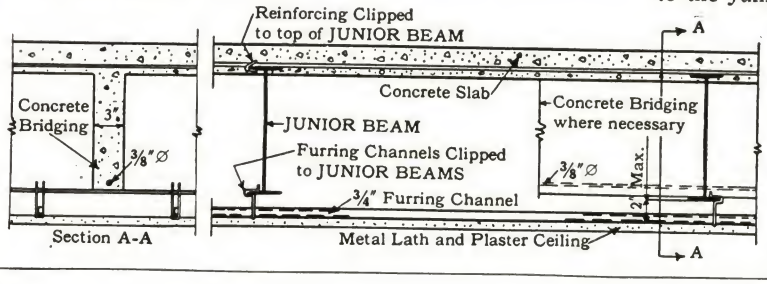
The slab is poured on removable forms and reinforced with ¼-in. rods on 6-in. centers.

The floor, due to the quality and pleasing appearance underneath where the ceiling is omitted, is particularly adaptable to the first floors of residences.

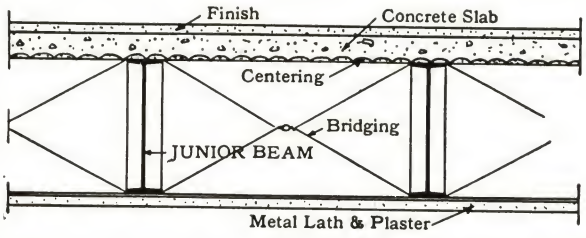
Concrete Slab on Removable Forms

By properly reinforcing a thin slab, the spacing of the Junior Beams may be increased so that the full strength of the slab is used.

Where possible, the Junior Beams are made continuous over three supports or more.



By encasing the top flanges, the floor is made rigid and does not require bridging, except where it is desired to transmit concentrated loads from one beam to another, or where it is deemed necessary to tie the floor laterally at right angles to the Junior Beams. Where such design is expedient, it is accomplished by rigid concrete bridging poured monolithic with the slabs of rigid steel tension compression bridging. The deflection is held to a minimum. The slab is poured on a simple removable form, either wood or metal. If wood is used, the beams can be spaced so that standard size boards may be used without ripping. Clips can be furnished for fastening the ceiling furring channels to the bottom flanges, allowing 2 in. to the bottom of the channel. This allows space for electrical conduits. This is the most economical quality floor which can be built.

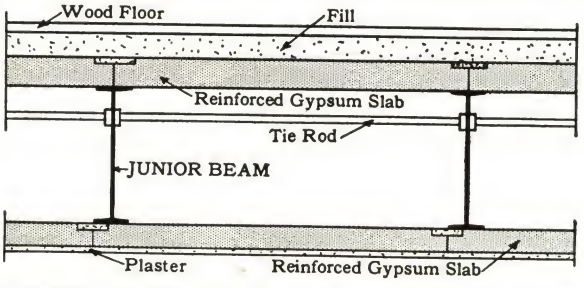


Concrete Slab on Permanent Centering

This is a common arrangement of Junior Beams and companion materials. The top slab consists of concrete poured on permanent centering.

The ceiling consists of gypsum or portland cement plaster on metal lath.

In order to insure ease in application, pencil rods and flat ceiling lath are recommended. Rigid tension compression bridging steel or concrete can be used instead of the wire bridging shown, which will afford more positive lateral support and distribute concentrated loads to adjacent beams.



Gypsum Slabs

The lightest common type of floor providing four-hour fire protection to the steel, is obtained by means of precast reinforced gypsum floor and ceiling slabs, securely fastened to the Junior Beams by means of various types of clips or hangers.

The floor slabs may be had in slabs 24x30 in. or in planks 6 ft. long.

This is the lightest floor providing four-hour fire protection and, in addition to the saving on the main steel frame, can be erected very quickly.

KALMAN STEEL CORPORATION

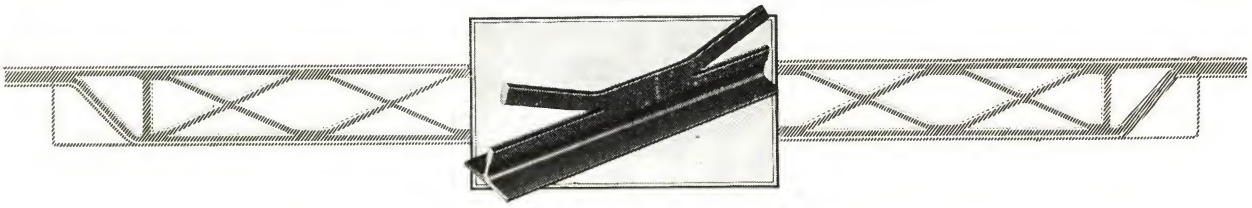
SUBSIDIARY OF BETHLEHEM STEEL CORPORATION

Manufacturers of Kalmantruss Joists

GENERAL OFFICES

BETHLEHEM, PA.

For Other Offices, see our page on Concrete Reinforcement



Kalmantruss Steel Joists in Floors and Roofs for Firesafe Construction

Products

KALMANTRUSS JOISTS, Rigid Bridging, and Accessories.

For Kalman pages on Concrete Reinforcement, and Steel Door Frames, see Manufacturers' Index.

General Description of Kalmantruss Joists

Kalmantruss Joists are light weight double lattice steel trusses made of structural grade new billet steel.

They are produced from small I-beams by a patented process in which the webs are slit and the I-beams rolled out to the required depth at a temperature of 1800° F.

One-piece Structure Insures Safety—The Kalmantruss Joist is not an assembly of individual parts.

Chords and inclined webs are formed from one piece and joints are in all cases capable of developing the full strength of web members.

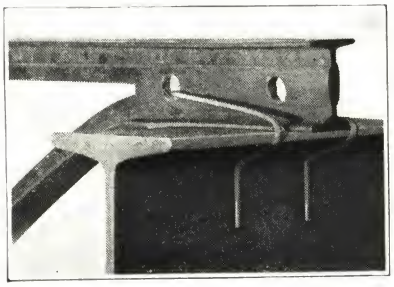
The ends of the truss are additionally strengthened by means of vertical posts electrically arc welded in place.

Positive Strength—Kalmantruss Joists are furnished for spans up to 32 ft. When properly installed and braced, they will carry a uniformly distributed live load greater than twice the rated live load capacity, and at rated capacity deflections will not exceed 1/360 of the span.

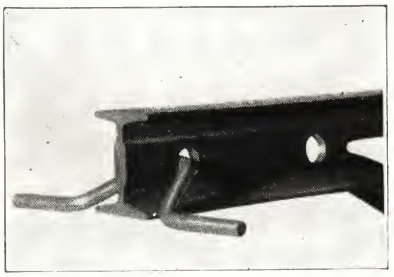
Adaptability—Kalmantruss Joists are particularly adapted for fire resistive floors and roofs of light occupancy buildings such as apartments, hotels, schools, hospitals, office buildings, private residences, etc.

The open webs permit complete concealment of pipes and electric conduits in the depth of floor construction.

Beam Anchors—Joists are attached to steel beams by $\frac{3}{16}$-in. rods looped through holes and clinched around flanges of supporting beams.



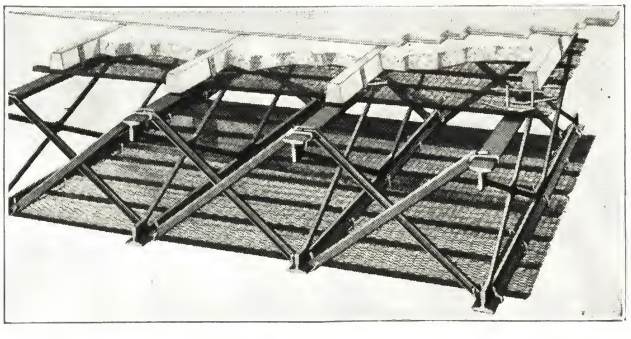
Wall Anchors—Joists are securely held in masonry walls by $\frac{3}{8}$-in. rod anchors inserted in holes as shown.



Kalmantruss Rigid Bridging for Kalmantruss

Rigid Bridging consists of 16 gauge channel members attached to joist flanges by heavy wire clips. This bridging provides substantial cross bracing which acts both in tension and compression to hold joists in vertical position. It assures accurate joist spacing, increases safety during construction, distributes floor loadings and stiffens entire floor construction. Bridging members and connection clips are designed to produce positive action in both tension and compression.

Bridging is furnished in proper lengths and arrives on job ready for installation. Clips fit snugly around joist flanges and produce the essential tightness without dependence upon workmen's skill.



Kalmantruss Rigid Bridging is an exclusive feature of Kalmantruss Joist construction.

Catalogue

Complete catalogue showing details of joist construction, specifications and safe load tables is available upon request.

In addition to Kalmantruss Joists and accessories, KALMAN STEEL CORPORATION offers a specially designed Metal Lath for use in floors and ceilings in joist construction.

THE MACOMBER STEEL COMPANY

Macomber Bar Joists and Macomber Nailer Joists

901 Belden Avenue, CANTON, OHIO

For Macomber Steel Building Products, see Manufacturers' Index

Steel Joist Products

Two distinct types of steel joists (U. S. Patents No. 1651032, No. 1614248, No. 1614247, No. 1614249) are manufactured. The Macomber Bar Joist is built up from steel bars and steel plates. It is designed to carry concrete floor decking, and concrete or steel roof decking. The Macomber Nailer Joist is built up from steel bars and steel plates, with steel bars and wood strip forming the top member of the joist. It is designed for nailing wood flooring and wood roof decking directly to this top member.

Characteristics of Macomber Joists

Both joists are manufactured in a series of standard stock sizes for all spans met with in building construction. Accessories for all framing conditions are handled in the same manner. Prompt shipment is made on all orders. Each joist is fabricated with structural arc welding into a solid structural unit that will withstand the abuse of rough handling. Detailed dimensions of all joists are printed in A. I. A. Catalogs.

The illustrations below show typical details of the joist. The A. I. A. Catalogs contain safe loading tables, complete specifications and designing data. The loading tables show total safe loads in pounds per square foot for various center to center spacings of joists.

Bar Joist Floor and Roof Construction

Concrete Decking—Two to three inches of concrete is poured on corrugated forms (or rib lath) secured to the top bars of the joists. Any type of finish flooring or roofing is laid on top of this slab.

Steel Roof Decking—Corrugated sheets or manufactured steel decking may be used in place of the concrete slab for roof construction. This is secured to the top bars with straps riveted to the sheets or with clips furnished by the decking manufacturer.

Ceiling Construction—A cement or hard finish plaster on metal lath ceiling completes the construction. A ⅜-in. rib lath is usually used with the ribs turned up to act as furring. A metal lath suspended ceiling is used below joists in panels pitched for roof slope or where shallower joists are used for short spans in irregular panels.

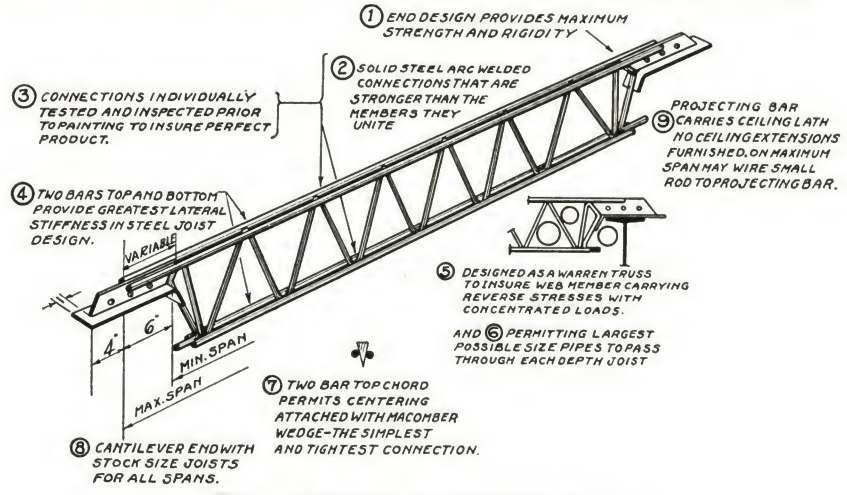
Macomber Bar Joists provide a decidedly economical, fireproof floor and roof construction.

Evidence of the quality of the construction may be found in thousands of fine buildings in all parts of the United States and Canada.

Macomber Nailer Joist Construction

Nailer Joists eliminate the concrete slab that is a component part of bar joist construction. Wood flooring or roof decking is nailed directly to the top member of the joists. In other respects the construction is identical with bar joist construction.

Nailer Joists provide a floor or roof with a high degree of fire resistance when built with metal lath and plaster ceiling. This results in a construction that is firesafe for many conditions at a cost that closely approaches that of ordinary construction. Nailer Joists are frequently used for roofs of otherwise strictly fireproof buildings.



Joist Specifications for Floors and Roofs

Note: The following specifications will fully protect the client's interests and insure good construction. The responsibility for preparing detailed erection plans is properly placed on the manufacturer.

Where indicated in the drawings the floors (and roof) shall be constructed with Macomber Bar Joists (Macomber Nailer Joists) as manufactured by the Macomber Steel Company, Canton, Ohio. Joists shall be provided of the proper size and spacing to carry the specified floor (and roof) loads. The depth of joists shall not exceed the depths indicated for the various floor (or roof) panels. In no case shall joists be spaced over ..... inches c-c in the floor construction (or over ..... inches c-c in the roof construction). Joists shall be provided alongside and parallel to the end walls in the floor (and roof) panels. Extra joists shall be provided as specified under partitions running parallel to and over the joists. Detailed erection plans shall be furnished by the manufacturer showing the location and placing of joists.

The joists shall be placed on the supporting walls and beams in accordance with the erection plans. At least 4 in. of bearing measured along the length of the joists shall be provided on masonry walls and every third joist end anchored to the wall with Macomber End Anchors. At least 4 in. of bearing shall be provided on steel framing and the joist ends anchored to the framing with Macomber anchors.

The end joists in each panel shall be anchored to the parallel wall or beam and all joists braced laterally as indicated in the plans. The anchors and bridging shall be placed at the center, third or quarter points to provide lines of bridging not exceeding 7 ft. on centers.

Where concrete slabs are specified the slab shall be poured on corrugated forms (or rib lath) secured to the top bars of the joists with Macomber Lath Wedges. Slabs not covered with wood top floor shall be adequately reinforced with wire mesh or steel rods.

Where plastered ceilings are specified a three coat ¾-in. cement or gypsum (hard wall) plaster shall be applied on metal lath. The lath shall be wired to the bottom bars of the joists with the ribs turned up to act as furring. The lath shall be suspended on furring channels to provide a level ceiling where different depth joists are used in irregular panels and under pitched roof panels.

The design of the floor (or roof) and its component parts shall meet requirements of the Steel Joist Institute Specifications.

Note: Where bar joists are to carry a concrete slab, the spacing of joists should not exceed 19 in. for garage floors, 24 in. for office, hotel and residential floors or 30 in. for roofs. The spacing of bar joists for steel roof decking depends on the strength of the decking and should not exceed 5 ft. Nailer joist spacings should not exceed 18 in. in floors or 30 in. in roofs.

TRUSCON STEEL COMPANY

Manufacturers of a Complete Line of Steel Building Products

YOUNGSTOWN, OHIO

Offices and Warehouses in Principal Cities—For List, see Our Pages on Steel Windows

Products

"O-T" (Open Truss) Steel Joists.
"P-G" (Plate Girder) Steel Joists.
Nailer Steel Joists.
"Clerespan" Trusses.

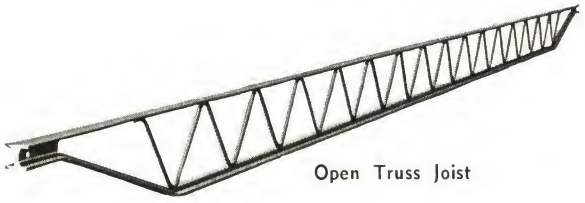
For other Truscon products, see pages in this edition on Concrete Reinforcing Steel; Steeldeck Roofs; Standardized Buildings and Structural Steel; Steel Doors; Steel Windows; Metal Lath and Accessories; Channelplate and Teegrid Floors; Safety-Tread Steel, as listed in Manufacturers' Index.

A Complete Line of Steel Joists for Every Building Condition

The fireproof floor construction of every building must be individually designed to obtain the most efficient results. One type of steel joist will not satisfactorily meet all conditions. Truscon, therefore, has developed three different types of steel joists and the "Clerespan" Truss, described below, each possessing certain distinctive advantages for various classes of work. Truscon engineers will welcome the opportunity to submit detailed recommendations on the proper application of the various types of floor construction.

Truscon "O-T" (Opens Truss) Steel Joists*

The design of the Open Truss Joist is based on the best engineering practice and includes many distinctive features. Top and bottom chords are wide tee-shaped members, providing the greatest resistance to buckling strains. The bottom tee is continuous to the bearings, where it is welded with web plate and top chord to form a solid I-beam. The web member is continuous from end to end to transmit positively the stresses. Welding of all joints is done by pressure-resistance method, assuring positive connections.



Open Truss Joist

The joists are completely shop-fabricated, are simple to install, and their open web permits the passage of pipes and conduits of any number and in any direction.

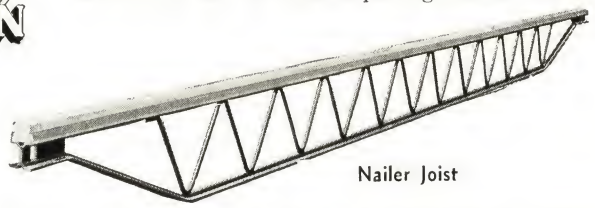
Truscon Nailer Steel Joists*

The Truscon Nailer Joist is an open truss joist, having the top member formed into a channel which securely holds a nailing strip. A wood floor is nailed directly to the joists as in ordinary wood construction. Nailer joists also are widely used as purlins.

These joists eliminate combustibility and shrinkage and, when protected with a metal lath and plaster ceiling below, have a high degree of fire safety. A special method of treating and attaching the wood nailing strip assures a permanent connection. Pipes may pass through the web in any direction.

Truscon "P-G" (Plate Girder) Steel Joists*

These joists are structural steel units, comparable in design and construction with the plate girders of bridges and buildings. The flanges are made of structural steel angles which are welded to the steel web to form a plate girder of enduring strength. The welding is by the pressure-resistance system of welding, assuring the perfect union of all the parts.



Nailer Joist

Plate girder joists are furnished in depths ranging from 6 to 14 in., which enables the architect or engineer to meet his particular conditions with the most efficient design. Easily placed by unskilled labor, using a 2-in. concrete slab above and metal lath ceiling below.

Plate Girder Joist

"Clerespan Trusses*

"Clerespan" Trusses may be used in a manner exactly paralleling the uses of Truscon Open Truss Steel Joists, but on spans greatly in excess of anything heretofore attempted in this type of construction.

They have been patterned after the Pratt Truss and are made from structural steel angles. All connections are made by means of pressure resistance welding, assuring positive joints. All compression stresses are reduced to provide for local as well as direct bending. In reality, "Clerespan" Trusses are box type lattice girders having a double web system, thus developing the most economical and efficient distribution of metal and resulting in the most rigid type of structural unit.

"Clerespan" Truss
For spans up to 56 ft.

One of the outstanding advantages of "Clerespan" construction is the elimination of numerous columns from the structure, thus making available larger unobstructed areas in floor space. In many types of buildings their use will automatically eliminate all columns with the exception of those in the outer walls. When used in roof construction, they meet every requirement of every type of building.

"Clerespan" Trusses may be used for floor spans up to 51 ft. and for roof spans up to 56 ft., depending upon the type.

*Complete catalogue and load table sent free upon request.

CREX PATENT COLUMN CO.

GENERAL OFFICE AND WORKS
2300-2310 South Springfield Avenue
CHICAGO, ILL.

TELEPHONE
Lawndale 2633, 2634, 2635

BRANCHES
MILWAUKEE, WIS., 2545 No. Thirtieth Street
DECATUR, ILL., Box 299
AKRON, OHIO, 407-8 Everett Building
LOUISVILLE, KY., 2719 Victor Place
TOLEDO, OHIO, P.O. Box 416

Product

Manufacturers of CREX PATENT COLUMNS.

Construction

Crex Patent columns consist of an outer shell of steel filled with concrete, and only the best materials are employed in their manufacture.

Especial care is taken in filling these columns so that the concrete filling shall be perfectly solid and uniform throughout, thus obtaining the full strength of a solid concrete interior.

The caps and connections are made of steel, of sufficient strength to receive the superimposed loads.

CREX PATENT COLUMN CO. holds the original patent for an all-steel cap. The cap being entirely of steel, its strength can be reliably computed.

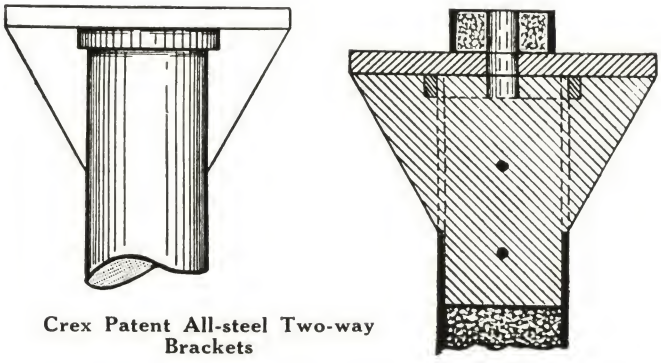
The connections are made in such a manner that only a steel plate separates the shaft of the lower column from the one above, securing the full strength of the column at the connection. Crex columns can be furnished in about one-fifth the time required for other columns.

Adaptability

Crex Patent columns are used extensively in factories, apartment buildings, stores, etc.

Safe Loads

Tables of safe loads in thousands of pounds for Crex light weight and heavy weight Patent columns are shown below.



Crex Patent All-steel Two-way Brackets

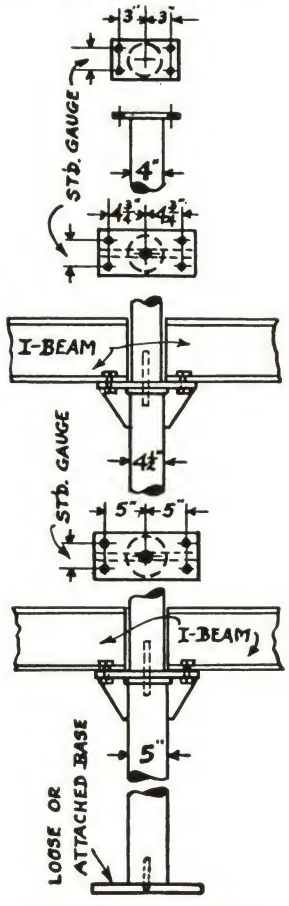
SAFE LOADS COMPILED BY THE PITTSBURGH TESTING LABORATORIES FROM ACTUAL TESTS MADE BY THEM OF CREX PATENT COLUMNS

Outside diam. pipe, in.	Radius of gyration, in.	Thickness of steel shell, in.	Area of steel shell, sq. in.	Wgt. of steel shell, per ft., lb.	Area of concrete, sq. in.	Weight of column per ft., lb.	Safe load in thousands of pounds for unbraced length of column, ft.								Maximum length of column
							6	8	10	12	14	16	18	20	
Light Weight Crex Columns															
3½	.875	.120	1.27	4.33	8.34	13.02	26.0	22.1	18.3						11′-8″
4	1.00	.134	1.63	5.53	10.94	16.9	35.6	31.2	26.8	22.4					13′-4″
Heavy Weight Crex Columns															
3½	.875	.216	2.23	7.58	7.39	15.27	37.8	32.2	26.5						11′-8″
4	1.00	.226	2.68	9.11	9.88	19.40	49.1	43.1	37.0	30.9					13′-4″
4½	1.125	.237	3.17	10.79	12.73	24.05	61.7	55.2	48.7	42.3	35.8				15′-0″
5	1.25	.247	3.69	12.54	15.95	29.15	75.6	68.6	61.7	54.8	47.8	40.9			16′-8″
5½	1.39	.258	4.30	14.62	20.00	35.45	92.2	84.8	77.4	70.0	62.6	55.2	47.7		18′-6″
6⅝	1.656	.280	5.58	18.97	28.89	49.07	128.4	120.0	111.7	103.4	95.0	86.7	78.3	70.0	22′-0″
7⅝	1.906	.301	6.92	23.54	38.74	63.89	167.3	158.0	148.8	139.6	130.5	121.4	112.1	102.8	25′-5″
8⅝	2.156	.322	8.40	28.55	50.02	80.65	211.1	201.1	191.0	180.9	170.8	160.8	150.7	140.6	27′-11″
9⅝	2.406	.342	9.97	33.91	62.79	99.31	259.2	248.2	237.3	226.4	215.4	204.5	193.5	182.6	31′-3″
10¾	2.687	.366	11.94	40.59	78.82	122.69	319.7	307.8	296.0	284.0	272.1	260.2	248.2	236.4	35′-10″
12¾	3.187	.375	14.58	49.56	113.10	167.36	421.7	408.7	396.0	382.8	369.8	356.9	343.9	330.7	42′-6″

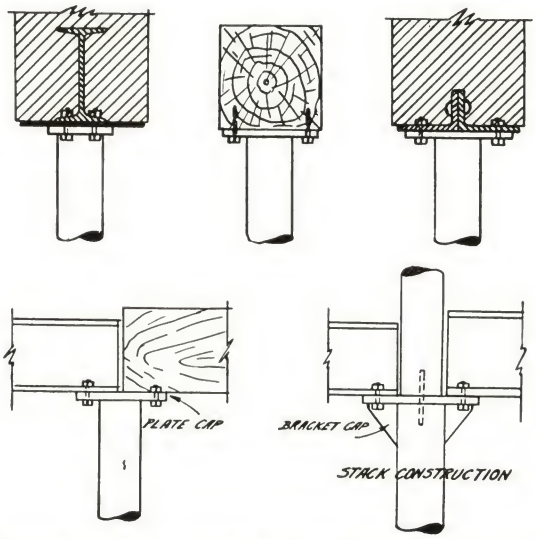
Safe loads shown above are derived from the formula:

$$\text{Safe Load} = \left(\frac{Ac}{12} + As\right)\left(19200 - 72\frac{L}{R}\right)$$

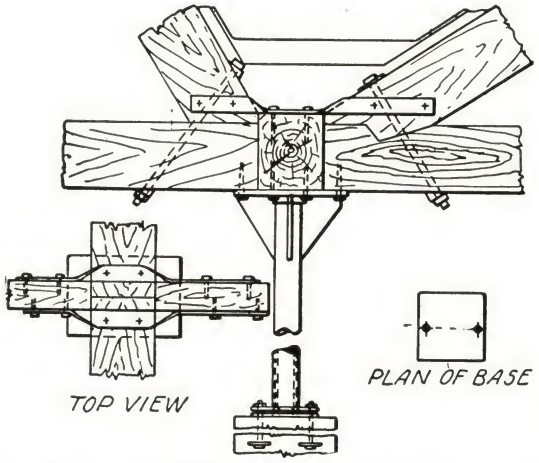
Where Ac = Sectional area of concrete in sq. ins.
As = Sectional area of steel pipe in sq. ins.
L = Length of column in ins.
R = Radius of gyration of combined sections
$\frac{L}{R}$ is never to be greater than 160
Weight of concrete to be 150 lb. cu. ft.



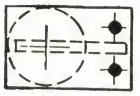
Columns in a Stack



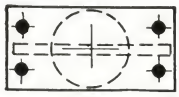
Various Types of Construction Where Crex Patent Columns Can Be Used as Supports



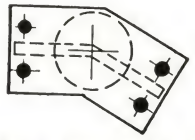
Details Showing Installation of Crex Columns in Type of Building Known as Sawtooth Construction



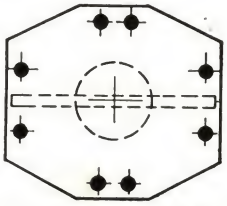
One-way Bracket Cap



Two-way Bracket Cap

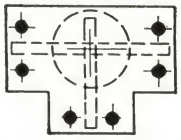


Angle Bracket Cap

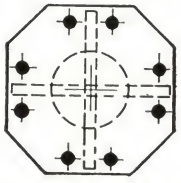


Two-way Bracketed Cap for Wood Trusses with Brackets Under the Trusses

Brackets may be had under the struts also

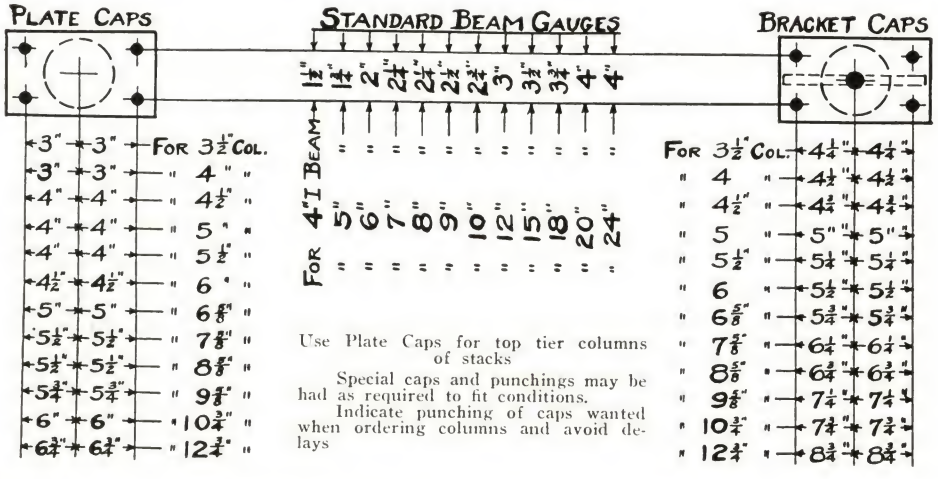


Three-way Bracket Cap



Four-way Bracket Cap

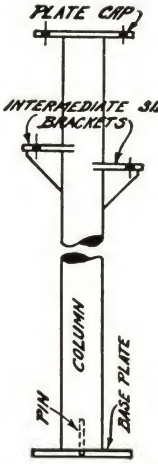
The above plans show different styles of caps and their respective names. All caps without brackets are called *plate caps*



Use Plate Caps for top tier columns of stacks

Special caps and punchings may be had as required to fit conditions.

Indicate punching of caps wanted when ordering columns and avoid delays



Column Provided with Intermediate Side Brackets

Approval

Crex Patent columns are approved by the building departments of all large cities.

Installations

Crex columns have been installed in thousands of buildings in various parts of the United States. This fact gives proof of the economy, reliability and fine appearance of Crex columns.

Prices, etc.

Quotations and any additional information furnished on request.

Catalogue

Will furnish on request catalogue showing different methods of design and uses of Crex Patented Columns in various classes of building construction.

ESTABLISHED 1897

LALLY COLUMN CO.

Manufacturers of Concrete Filled Columns

CAMBRIDGE, MASS.

FACTORIES

CHICAGO, ILL., 4001 Wentworth Avenue — CAMBRIDGE, MASS., Erie and Albany Streets — BROOKLYN, N. Y., 211-249 Lombardy Street

Products

LALLY COLUMNS with patented Steel Connections and Bracketed Caps securely fastened, making a rigid tie between beams and columns.

Patents

Various improvements on Lally columns are covered by numerous patents under different dates extending from 1898 to the present time.

Infringements will be prosecuted.

Manufacturing Process

Lally Columns are manufactured by the LALLY COLUMN CO., INC., of New York, the LALLY COLUMN CO., Cambridge, Mass., and the LALLY COLUMN CO. of Chicago, representing an annual production of hundreds of thousands of columns.

The column is a *shop-made* unit manufactured under the most thorough and careful supervision and inspection, and is shipped to the job ready for erection.

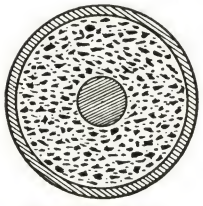
Standard tested mild steel pipes, 3½ to 12¾ inches outside diameter, are cut to the lengths required by plans and specifications, slotted to receive beam connections and splice plates, set up perpendicular on level bases and held in a vertical position by lateral supports. A machine-mixed stone concrete fill is deposited in the shell and, to insure dense concrete, shaft is agitated before initial set takes place by an electric hammer operated on exterior of pipe. The vibration compacts the concrete, liberates the confined air and eliminates all air holes and cavities in the aggregate. The resulting material is of considerably greater compressive strength than ordinary cast-in-the-field concrete. When seasoned, the column is lifted out of position, sandpapered on the exterior surface to remove all cement, and then painted.

Reinforcements for Lally Columns

To meet various requirements, including the amount of load to be carried, Lally columns can be reinforced as shown in the accompanying illustrations.

In all cases the concrete is *compressed,* eliminating all air voids (Fig. 1).

Outer Shell Filled with Compressed Concrete



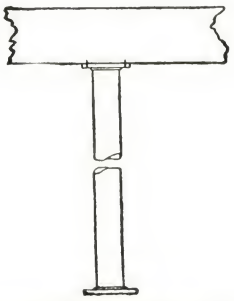
Single Steel Bar Reinforcement

Pipe Reinforcement

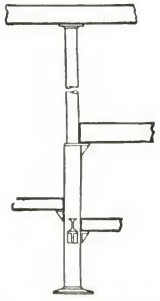
Four Angle Iron Reinforcement

Fig. 1. Sectional Views Showing Manner of Reinforcement of Lally Columns

Note: The angle iron reinforcement above makes a compact fireproof column; column is designed so that load is carried by the four angle irons and concrete within radius of same; outer shell and outer concrete act as fireproofing, making a column practically indestructible



Plain, with Ordinary Plate for Wood Beam Connection



With Beam Supports at Different Elevations

Fig. 2. Types of Lally Columns

Bracket and Beam Support

Where one column sets over the other, our latest construction of bracket and beam support is used, as shown in Fig. 3. This style of cap consists of crown plate and steel bracket inserted through slots in column shaft and firmly affixed thereto.

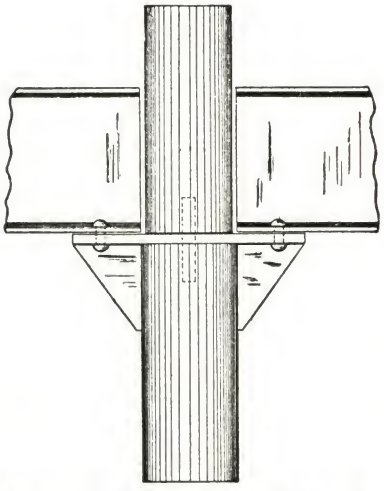


Fig. 3. Steel Bracket and Beam Support

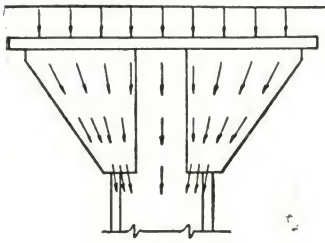


Fig. 4. Steel

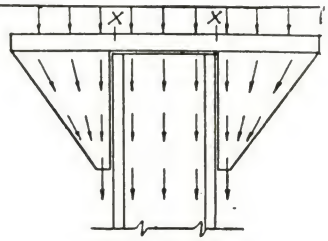


Fig. 5. Cast Iron

Bracket Caps

Fig. 4. Cross section of a typical Lally steel bracket cap showing diagrammatically with arrows how all the load on the cap plate is distributed to the column, eliminating the chance of failure due to improper distribution of the load

Fig. 5. Cross section of a typical loose cast iron cap showing by means of arrows that only part of the load is distributed directly to the column, thereby causing failure by shear at the points marked "x." Load between points "x—x" is the only load carried by the column

Approvals

The Lally column is endorsed by engineers throughout the country, and approvals have been granted for its use by all the leading city building departments after extensive tests and investigations. Its adaptability to all forms of building construction, its economy in first cost and in floor space occupied, its speed of erection, as well as its strength, durability and practical performance, have been demonstrated by successful and uniformly satisfactory use under especially severe conditions.

Fire Resistance

The value of the Lally column in fire resisting construction has been frequently demonstrated both in actual fires and scientifically conducted fire tests. This type of column section, without additional exterior protection, has withstood the flames and high temperatures of some of the greatest fires; such as the Chelsea conflagration in April, 1908, the Salem fire in June, 1914, the Standard Oil fire at Greenpoint, N. Y., in September, 1919, and the fire in the Edison Phonograph Works at West Orange, N. J., in December, 1914. In this latter fire, large pieces of steel and cast iron melted in the same building in which concrete-filled pipe columns were used and there were evidences of exposed concrete having been fused. The defect produced on the concrete-filled steel pipe columns was a slight lateral bend which was generally less than 1 inch. A complete report on the fire in the Edison Phonograph Works was prepared under the joint auspices of the National Fire Protection Association and the National Board of Fire Underwriters and gives in detail the effects of fire on the various materials which entered into the construction.

In the Underwriters' Laboratories at Chicago, Ill., 1917-1919, two types of Lally columns were tested in a series of fire tests of structural steel, reinforced concrete, steel pipe and cast iron columns. The Lally columns were unprotected on the exterior surface. These columns were tested under Standard time-temperature fire curve conditions while supporting loads in excess of the recommended design loads. As a result of the tests, the comparative fire resisting ratings of Lally columns were determined as 25 minutes for the unreinforced, which was 11% overloaded during the test, and 45 minutes for the reinforced section, which was 3% overloaded during the test. Actual test runs were 36 minutes and 1 hour 11¾ minutes, respectively. Compared to these ratings, unprotected structural steel and round cast iron columns were granted tentative ratings of only 10 and 20 minutes, respectively. Lally column ratings would probably have been still further increased if the test loads had not exceeded the safe working values recommended.

Safe Loads

We call attention to a material change in the safe loads, as shown in the table below, increasing the accepted safe loads for Lally columns. Please bear in mind that when a project is designed for Lally columns according to this strength list *they* should be specified, and no other concrete filled column substituted unless the sizes are increased to a diameter that will be equal in carrying capacity to the genuine Lally columns.

References

The names and addresses of the principal purchasers and satisfied users of Lally columns will be furnished on request.

SAFE LOADS FOR LALLY CONCRETE FILLED COLUMNS IN THOUSANDS OF POUNDS

Limit of Length=40 Diameters (l/r=120) P=(Ac+12 As) (1600–24l/d)

	Diam. of col., in.	Weight per ft., lb.	Area of steel, sq. in.	Area of concrete, sq. in.	Unbraced length of column in feet															*Max. length, ft.
					6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Light weight	3½	13	1.27	8.35	26.1	24.2	22.2	20.3	18.3	16.4	14.5									11.91
	4	17	1.63	10.94	35.6	33.4	31.2	29.0	26.8	24.6	22.4	20.2								13.71
Heavy weight	3½	15	2.23	7.39	37.9	35.1	32.3	29.4	26.7	24.0										11.64
	4	20	2.68	9.89	49.2	46.1	43.1	40.1	37.0	33.9	30.9	27.9								13.37
	4½	24	3.17	12.73	61.8	58.5	55.3	52.0	48.8	45.5	42.3	39.0	35.8	32.5						15.10
	5	29	3.69	15.95	75.6	72.0	68.6	65.2	61.7	58.2	54.7	51.3	47.8	44.3	40.9	37.4				16.83
	5½	36	4.30	20.01	92.1	88.3	84.6	80.8	77.1	73.3	69.6	65.8	62.1	58.3	54.6	50.8	47.1	43.3		18.78
	6⅝	49	5.58	28.89	128.3	124.2	120.0	115.8	111.7	107.5	103.4	99.2	95.0	90.9	86.7	82.6	78.4	74.2	70.1	22.45
	7⅝	64	6.92	38.74	166.0	161.4	156.9	152.3	147.8	143.2	138.6	134.1	129.7	125.0	120.5	115.9	111.4	106.8	102.3	25.92
	8⅝	81	8.40	50.03	211.1	206.1	201.1	196.1	191.0	186.0	181.0	175.9	170.9	165.9	160.8	155.8	150.8	145.8	140.7	29.38
	9⅝	100	9.97	62.79	259.2	253.8	248.3	242.8	237.4	231.9	226.5	221.0	215.6	210.1	204.6	199.2	193.7	188.3	182.8	32.84
	10¾	123	11.91	78.86	319.1	313.1	307.2	301.3	295.4	289.4	283.5	277.6	271.6	265.7	259.7	253.8	247.9	241.9	236.0	36.74
	12¾	169	14.58	113.10	421.9	415.4	408.8	402.3	395.8	389.2	382.8	376.2	369.7	363.2	356.7	350.1	343.6	337.1	330.6	43.77

*Radius of gyration equals ⅓ quantity in this column.

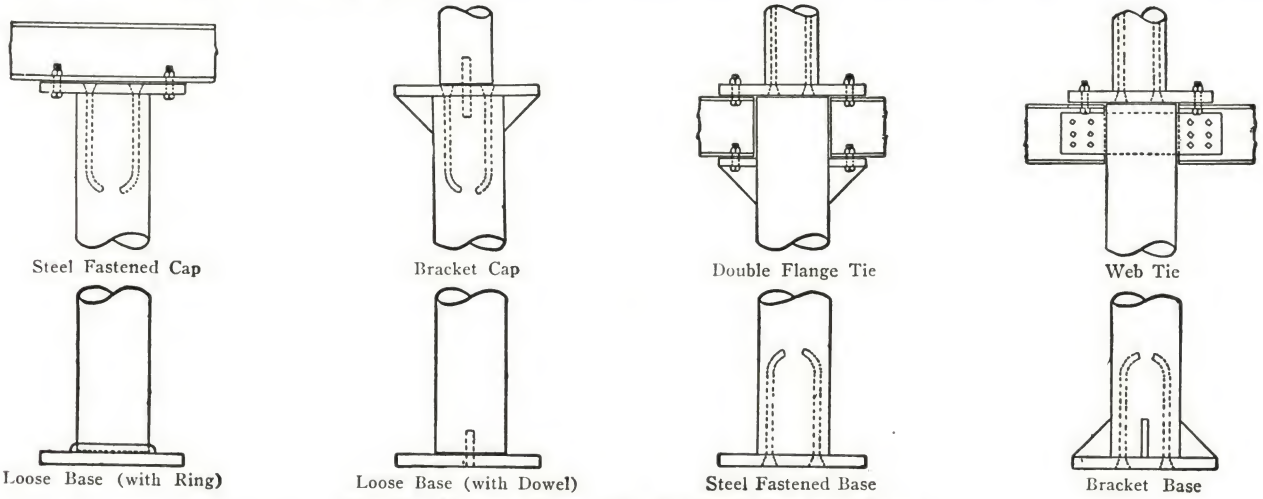


Fig. 6. Various Types of Lally Steel Caps and Bases

Specify Lally columns complete with steel caps and bases as manufactured by LALLY COLUMN CO.

THE MACOMBER STEEL COMPANY

Macomber Steel Building Products

901 Belden Avenue, CANTON, OHIO

Products

MACOMBER ROOF TRUSSES and TRUSS BRACING.
"H" COLUMNS and STEEL FRAMING.
STEEL DOORS and STEEL WINDOWS.
STRUCTURAL and REINFORCING STEEL.
For Macomber Bar Joists and Macomber Nailer Joists, see Manufacturers' Index.

Type of Products

Through the use of patented Macomber features, structural building products are manufactured in standard stock sizes for prompt shipment on all orders. These products are readily designed into buildings by architects or engineers. Complete structural layouts for erection purposes are furnished as a part of the service and submitted for approval to the architect or engineer designing the building. Complete stocks of steel windows, metal lath and structural and reinforcing steel round out this service.

Bar Joists for fireproof floor and roof construction; Nailer Joists for semi-fireproof construction; and Vault Reinforcing for banks and financial institutions are covered in separate pages as noted.

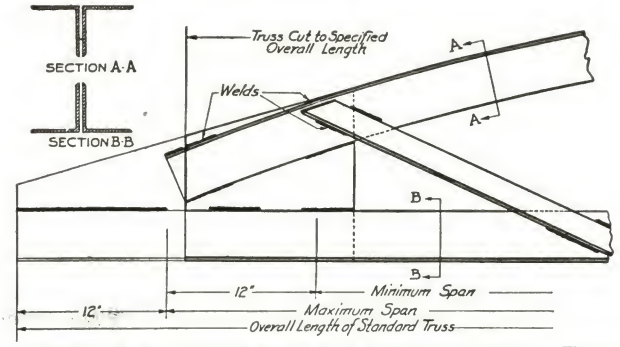
These products and the products covered here are widely used and specified as component parts of practically all types of buildings.

The full use of Macomber Service permits the architect to plan and design industrial buildings to meet the individual needs of his clients at costs competitive with the less desirable "Standard Buildings."

Prompt shipment of Macomber materials and ease in designing with any type of wall and roof construction has resulted in an ever increasing demand for Macomber Products for this field.

Macomber Roof Trusses

The Macomber Roof Truss (U. S. Patent No. 1678738) is essentially a steel roof truss built up with double angle top and bottom chords and fabricated with modern electric arc welding. Loading Tables (A.I.S.C. Specifications) and overall dimensions for stock size curve chord trusses are listed in adjoining tables. "A" type trusses are handled in the same manner. These stock size trusses are designed into buildings as easily as simple beams. The trusses should be spaced to develop their full carrying capacity for maximum efficiency.



Detail of a standard truss end is shown above. Trusses may be cut to specified overall length to suit the framing conditions. Shorter trusses are shipped in one piece. Longer trusses are fabricated, match marked, and knocked down for shipment in sections for ease in handling and erecting on the job. Holes for field connections are reamed to $\frac{3}{4}$ in. clearance in fabricating and fitted with turned bolts. No metal less than $\frac{1}{4}$ in. in thickness is used.

SAFE LOADING TABLES, STOCK SIZES CL AND CH TRUSSES

A.I.S.C. Specifications

Overall Height—Approx. $\frac{1}{10}$ Max. Span

CL SERIES

Truss symbol	Overall length	Range of spans		Safe load in pounds	
		Min. span	Max. span	@ Min. span	@ Max. span
38-CL	40′ 0″	36′ 0″	38′ 0″	37,000	35,000
40-CL	42′ 0″	38′ 0″	40′ 0″	37,000	35,000
42-CL	44′ 0″	40′ 0″	42′ 0″	37,000	35,000
44-CL	46′ 0″	42′ 0″	44′ 0″	43,300	41,500
46-CL	48′ 0″	44′ 0″	46′ 0″	43,300	41,500
48-CL	50′ 0″	46′ 0″	48′ 0″	43,300	41,500
50-CL	52′ 0″	48′ 0″	50′ 0″	43,300	41,500
52-CL	54′ 0″	50′ 0″	52′ 0″	43,300	41,500
54-CL	56′ 0″	52′ 0″	54′ 0″	49,500	47,600
56-CL	58′ 0″	54′ 0″	56′ 0″	49,500	47,600
58-CL	60′ 0″	56′ 0″	58′ 0″	49,500	47,600
60-CL	62′ 0″	58′ 0″	60′ 0″	49,500	47,600
62-CL	64′ 0″	60′ 0″	62′ 0″	49,500	47,600
64-CL	66′ 0″	62′ 0″	64′ 0″	49,500	47,600
66-CL	68′ 0″	64′ 0″	66′ 0″	49,500	47,600
68-CL	70′ 0″	66′ 0″	68′ 0″	49,500	47,600
70-CL	72′ 0″	68′ 0″	70′ 0″	59,000	57,300
72-CL	74′ 0″	70′ 0″	72′ 0″	59,000	57,300
74-CL	76′ 0″	72′ 0″	74′ 0″	59,000	57,300
76-CL	78′ 0″	74′ 0″	76′ 0″	59,000	57,300
78-CL	80′ 0″	76′ 0″	78′ 0″	59,000	57,300
80-CL	82′ 0″	78′ 0″	80′ 0″	72,600	70,500
82-CL	84′ 0″	80′ 0″	82′ 0″	72,600	70,500
84-CL	86′ 0″	82′ 0″	84′ 0″	72,600	70,500
86-CL	88′ 0″	84′ 0″	86′ 0″	86,400	84,700
88-CL	90′ 0″	86′ 0″	88′ 0″	86,400	84,700
90-CL	92′ 0″	88′ 0″	90′ 0″	86,400	84,700
92-CL	94′ 0″	90′ 0″	92′ 0″	86,400	84,700
94-CL	96′ 0″	92′ 0″	94′ 0″	86,400	84,700
96-CL	98′ 0″	94′ 0″	96′ 0″	86,400	84,700
98-CL	100′ 0″	96′ 0″	98′ 0″	86,400	84,700
100-CL	102′ 0″	98′ 0″	100′ 0″	86,400	84,700
120-CL	122′ 0″	118′ 0″	120′ 0″	108,600	106,500

CH SERIES

Truss symbol	Overall length	Range of spans		Safe load in pounds	
		Min. span	Max span	@ Min. span	@ Max. span
38-CH	40′ 0″	36′ 0″	38′ 0″	42,200	41,500
40-CH	42′ 0″	38′ 0″	40′ 0″	42,200	41,500
42-CH	44′ 0″	40′ 0″	42′ 0″	42,200	41,500
44-CH	46′ 0″	42′ 0″	44′ 0″	49,500	47,600
46-CH	48′ 0″	44′ 0″	46′ 0″	49,500	47,600
48-CH	50′ 0″	46′ 0″	48′ 0″	49,500	47,600
50-CH	52′ 0″	48′ 0″	50′ 0″	49,500	47,600
52-CH	54′ 0″	50′ 0″	52′ 0″	59,600	57,300
54-CH	56′ 0″	52′ 0″	54′ 0″	59,600	57,300
56-CH	58′ 0″	54′ 0″	56′ 0″	59,600	57,300
58-CH	60′ 0″	56′ 0″	58′ 0″	59,600	57,300
60-CH	62′ 0″	58′ 0″	60′ 0″	59,600	57,300
62-CH	64′ 0″	60′ 0″	62′ 0″	73,300	70,500
64-CH	66′ 0″	62′ 0″	64′ 0″	73,300	70,500
66-CH	68′ 0″	64′ 0″	66′ 0″	73,300	70,500
68-CH	70′ 0″	66′ 0″	68′ 0″	73,300	70,500
70-CH	72′ 0″	68′ 0″	70′ 0″	87,300	84,700
72-CH	74′ 0″	70′ 0″	72′ 0″	87,300	84,700
74-CH	76′ 0″	72′ 0″	74′ 0″	87,300	84,700
76-CH	78′ 0″	74′ 0″	76′ 0″	87,300	84,700
78-CH	80′ 0″	76′ 0″	78′ 0″	87,300	84,700
80-CH	82′ 0″	78′ 0″	80′ 0″	87,300	84,700
82-CH	84′ 0″	80′ 0″	82′ 0″	87,300	84,700
84-CH	86′ 0″	82′ 0″	84′ 0″	87,300	84,700
86-CH	88′ 0″	84′ 0″	86′ 0″	108,600	106,500
88-CH	90′ 0″	86′ 0″	88′ 0″	108,600	106,500
90-CH	92′ 0″	88′ 0″	90′ 0″	108,600	106,500
92-CH	94′ 0″	90′ 0″	92′ 0″	108,600	106,500
94-CH	96′ 0″	92′ 0″	94′ 0″	108,600	106,500
96-CH	98′ 0″	94′ 0″	96′ 0″	108,600	106,500
98-CH	100′ 0″	96′ 0″	98′ 0″	108,600	106,500
100-CH	102′ 0″	98′ 0″	100′ 0″	108,600	106,500
120-CH	122′ 0″	118′ 0″	120′ 0″	142,000	140,000

TRUSCON STEEL COMPANY

Manufacturers of a Complete Line of Steel Building Products

YOUNGSTOWN, OHIO

Offices and Warehouses in Principal Cities—For List, see Our Pages on Steel Windows

Products

STANDARDIZED BUILDINGS and STRUCTURAL STEEL. For other Truscon Products, see pages in this edition on Concrete Reinforcing Steel, Steel Joists, Steeldeck Roofs, Steel Doors, Steel Windows, Metal Laths and Accessories as listed in Manufacturers' Index.

Standardized Buildings

Architects and contractors, confronted with the necessity of providing industrial buildings that are small or moderate in size, frequently are in a position to utilize the advantages offered by Truscon Standardized Buildings. These buildings involve only the use of regular Truscon products, but their application has been so coordinated that considerable savings may be made. Their variety of types, together with the option of steel panels, Ferroclad Insulation, brick, concrete or stucco sidewalls, allow a wide latitude in the design of the individual structure.

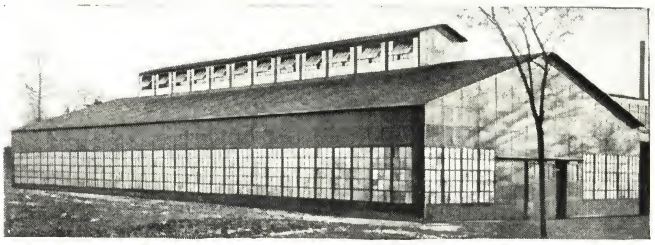
Materials—***Structural Steel for Framing***—Conforms to accepted practice and is designed to support standard loads.

Steel Windows—Truscon Standard Steel Windows are used throughout.

Steel Doors—Standard swing or slide types for openings up to approximately 9 ft. square; other Truscon doors for larger openings.

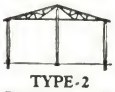
Roofdeck—Truscon Ferrodeck, insulated to any degree and waterproofed with standard roofing.

Sidewalls and Curtain Walls—As selected. Solid steel panels, Ferroclad Insulation, brick, concrete or stucco, or walls entirely of steel windows.



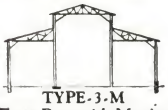
SERIES "A" Pitched Roof Types

TYPE-1 Clear Span

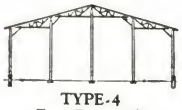


TYPE-2 Two Bays wide

TYPE-3 Three Bays wide



TYPE-3-M Three Bays with Monitor.



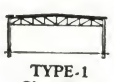
TYPE-4 Four Bays wide

SAWTOOTH TYPE any number of Bays wide

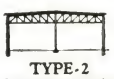
Type	Widths of buildings: Series "A" Pitched roof types	Series "B" Flat roof types
1 Clear span	8′, **12′**, 16′, **20′**, 24′, 28′	20′, 24′, 28′, 32′, 36′, 40′, 44′, 48′, 50′, 52′, 56′, 60′
2 Two bays	40′, 48′, 50′, 56′, 60′	40′, 48′, 56′, 60′, 64′, 80′, 100′, 120′
3 Three bays	56′, 60′, 64′, 68′, 72′, 76′, 80′, 84′, 88′, 96′, 98′, 106′, 108′, 116′	64′, 68′, 72′, 80′, 84′, 88′, 90′, 96′, **106′**, 116′
3-M Three bays with monitor	60′, 64′, 68′, 72′, 76′, 80′, 84′, 88′, 90′, 96′, 100′, 106′, 108′, 116′	96′, 104′, 112′, 114′, 120′, 124′, 130′, 132′, 140′, 150′, 160′, 170′, 180′
4 and 4-M Four bays	86′, 100′, 112′	80′, 88′, 96′, 100′, 104′, 108′, 112′, 116′, 120′
Sawtooth	Any multiple of 28′-0″	

Lengths of all buildings: multiples of 2 ft.

SERIES "B" Flat Roof Types

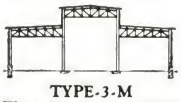


TYPE-1 Clear Span

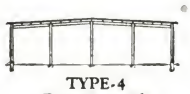


TYPE-2 Two Bays wide

TYPE-3 Three Bays wide

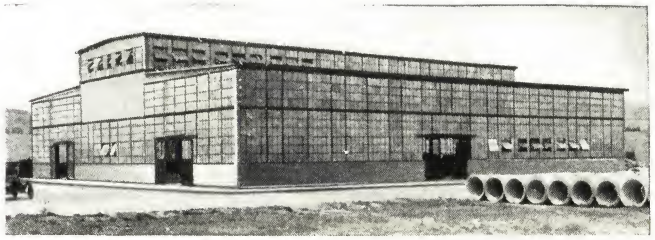


TYPE-3-M Three Bays with Monitor



TYPE-4 Four Bays wide

TYPE-4-M Four Bays with Monitor



Ferroclad Walls

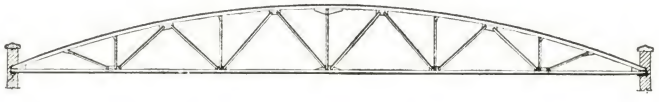
This new development by Truscon consists of sidewall panels having 1 in. of high grade insulation permanently sealed between a 20-gauge galvanized sheet on the outside and a 24-gauge sheet on the inside. Construction details are structurally correct, practical and economical in application. Ferroclad Walls have approximately the same resistance to temperature change as that offered by 12 in. of masonry.

Structural Steel

Truscon's structural steel fabrication shops are among the largest in the country and contain complete facilities for the engineering and fabrication of structural steel to any specifications. Truscon Engineers welcome the opportunity to collaborate with architects and engineers in developing the most efficient use of structural steel.

Trusses

To meet the demand for a standard design of curved chord, or "bowstring," truss, Truscon has developed two series of these trusses, incorporating eight different spans. Truscon Bowstring Trusses offer decided economies. Aside from their low initial cost, their use results in a lower building height with a minimum of material used in the end walls. There is a minimum of dead air space to heat. All types of roofing, except overlapping deckings, are adaptable to these trusses.



The trusses are designed in accordance with the A. I. S. C. Specifications. They are intended primarily for a roofdeck supported, preferably, by steel joists; and for that reason the panel points are 5 ft. apart with the top chord designed for a concentrated load equal to one-half the panel load at the center of each panel. The depth at the center of all trusses is a few inches greater than one-tenth of the span.

All trusses are fabricated of double angle top and bottom chords, with angles and plates serving for the web and gussets. All shop connections are riveted.

Standard Spans—Series "BL" and "BH"; 40, 50, 60, 70, 80, 90, 100 and 120 ft. Series "BL" trusses are designed for a total load of 700 lb. per linear foot; Series "BH" for a total load of 1,000 lb. per linear foot.

Service

Truscon Engineers co-operate fully with architects in developing buildings which will meet requirements satisfactorily. Suggestions and quotations will be furnished without obligation.

BLAW-KNOX COMPANY

Steel Roof Sheathing

2074 Farmers Bank Building, PITTSBURGH, PA.

NEW YORK, N. Y., Canadian Pacific Building
PHILADELPHIA, PA., 906 Widener Building
CLEVELAND, OHIO, 526 Union Building
CHICAGO, ILL., Peoples Gas Building
BIRMINGHAM, ALA., Brown-Marx Building
DETROIT, MICH., Book Tower Building
BUFFALO, N. Y., Genesee Building
BALTIMORE, MD., Bayard and Warner Streets
EXPORT DIVISION: Blaw-Knox International Corp., Canadian Pacific Building, NEW YORK, N. Y.
LONDON, ENGLAND, New Oxford House, Hart Street, HOLBORN, W.C. 1
PARIS, FRANCE, 1 Rue de Clichy
MILAN, ITALY, 6 via S. Agnesse, 6
DUSSELDORF, GERMANY, 17, Bismarckstrasse

For other products, see Manufacturers' Index

Blawsteel Roof Sheathing

Blawsteel Roof Sheathing has been developed with the idea in mind of giving to the building industry a more satisfactory sheathing than any heretofore produced for building roofs.

Blawsteel Galvanized Sheathing is light in weight, strong, firesafe, and impervious to dampness. It will not shrink or crack; will not burn; is easily and cheaply erected and is economical.

Strength—Standard Blawsteel Sheathing will carry a roof load of 65 lb. per sq. ft. on standard purlin spacing with a factor of safety of 4, with less than allowable deflection for plastered ceilings. It will carry 100 lb. per sq. ft. with only $\frac{3}{16}$-in. deflection.

The usual roof load required by city building codes is 40 lb.

Standard purlin spacing is 3 ft. 10½ in. which is the most economical spacing.

Blawsteel Sheathing is furnished, however, in heavier gauge; so that the same roof load can be carried over greater spaces between purlins.

Permanence—Blawsteel Sheathing is made of copper-bearing galvanized steel. It is galvanized, because galvanizing is the best coating that has yet been found to protect steel, and it is intended that Blawsteel Sheathing shall last as long as the building on which it is used.

Recommended Purlin Spacing—The most economical design for steel sheathing is a short purlin span (not over 3 ft. 10½ in. to 4 ft. 10½ in.).

Occasionally a little weight can be saved in the purlins by spacing them farther apart, but this generally requires heavier steel sheathing and structural steel is cheaper per pound than steel sheet. It is advisable therefore, to space purlins, if possible, on 3 ft. 10½-in. centers, which gives the cheapest construction and at the same time a stronger and more rigid roof.

BLAWSTEEL ROOF SHEATHING

Table of safe load capacities—pounds per square foot and deflection in inches at center

Span, ft.	Span, in.	Gauge	Safe load, lb. per sq. ft.	Deflection, in.			
				Load 20 lb. per sq. ft.	Load 30 lb. per sq. ft.	Load 40 lb. per sq. ft.	Load 50 lb. per sq. ft.
3	6	24	76	.047	.058	.069	.081
4	0	24	60	.069	.086	.102	.120
4	6	24	46	.098	.122	.152	.177

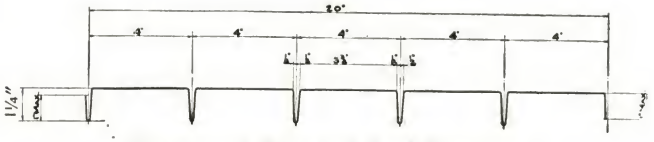


Diagram of Blawsteel Roof Sheathing

BLAWSTEEL LONGSPAN ROOF SHEATHING

Table of safe load capacities—pounds per square foot and deflection in inches at center

Span, ft.	Span, in.	Gauge	Safe load, lb. per sq. ft.	Deflection, in.			
				Load 20 lb. per sq. ft.	Load 30 lb. per sq. ft.	Load 40 lb. per sq. ft.	Load 50 lb. per sq. ft.
5	0	20	94	.058	.087	.112	.140
5	6	20	78	.084	.125	.167	.211
6	0	20	65	.096	.144	.192	.238
6	6	20	55	.121	.183	.242	.302
7	0	20	47	.155	.231	.312	.396
7	6	20	42	.197	.295	.392	.493
7	6	18	46	.165	.239	.322	.382
8	0	18	42	.234	.354	.468	.588
8	6	18	37	.281	.425	.562	.706

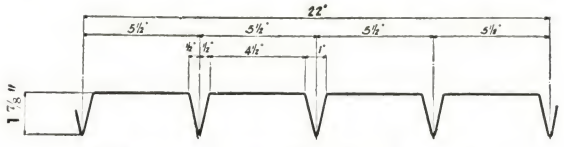
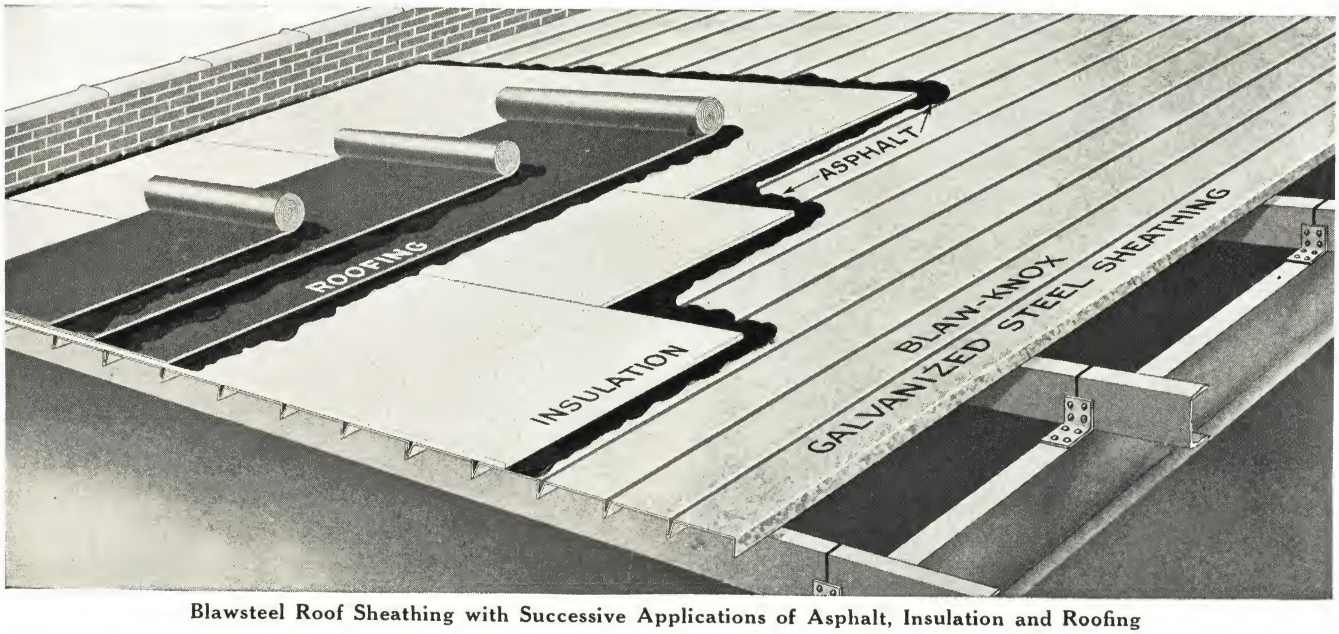


Diagram of Longspan Roof Sheathing



Blawsteel Roof Sheathing with Successive Applications of Asphalt, Insulation and Roofing

DETROIT STEEL PRODUCTS COMPANY

Manufacturers of Holorib Steel Roof Decks and Steel Floor Forms

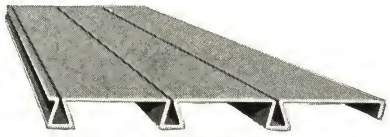
2250 East Grand Boulevard, DETROIT, MICH.

FACTORIES: DETROIT, MICH., OAKLAND, CALIF., and TORONTO, ONT., CANADA

BRANCHES AND AGENCIES IN 217 CITIES—Telephone Listing "Fenestra"

The Products

Holorib Reinforced Steel Roof Plates are designed to form the rigid and permanent base of a completely insulated and waterproofed unit.



Fenestra Holorib Sheet

Holorib Deck Plates are fabricated from copper-bearing or galvanized steel sheets reinforced by self-contained triangular ribs rolled into the sheet longitudinally, which are anchored or welded to the purlins by specially formed anchor clips. The sheets dovetail and interlock securely together both on sides and ends, forming a deck through which there is no asphalt drippage.

Narrow span 24-gauge Holorib sheets are rolled with triangular ribs ¾ in. deep spaced 3¼ in. on centers. They are specially designed for structural purlins or light joists spaced approximately 4 ft. Wide span Holorib sheets are fabricated from 22, 20, or 18-gauge sheets with triangular ribs 1½ in. deep and will cover with unusual rigidity purlin spacings as high as 8 ft. 6 in.

All Holorib sheets are dip-coated and oven-baked at the factory with a steel gray finish forming a tough protective film. By this process no metal in the Holorib sheet is left bare.

The angles forming the rib of the Holorib sheet are less acute than in other decks. There is no distortion of the metal.

Sanacoustic Holorib for Roofs

Fenestra Sanacoustic Holorib combines in one unit a perforated steel ceiling and roof deck of copper-bearing steel which supports sound absorptive rock cork and insulation.

Weathered by alternate layers of asphalt and built-up roofing, this unit combines 82% sound absorption at a frequency of 512 with a coefficient of heat transmission of .15 B.t.u. per hour.

Thus it provides a high degree of sound quieting and heat stop value at a cost far below that of other materials of equal efficiency.

Setting Holorib Clips

Laying a Holorib Sheet

Anchoring Holorib Clips to Sheets

Making Holorib Endlap

Sanacoustic Holorib is always applied only under definite specifications which include J-M Rock Cork, insulation, and built-up asbestos roofing. It provides an acoustically treated ceiling and a long-lived roof well suited to gymnasiums, factory administration buildings, field houses and certain types of auditoriums and schools at very reasonable cost.

Adaptability

Holorib steel deck construction is applicable to flat, pitched, or bowstring truss roofs, and the proper gauge Holorib sheets are fabricated for those purlin spacings which are most economical in the use of structural steel. It is especially adapted to all types of commercial and industrial buildings, including airplane hangars, theatres, and schools.

Outstanding Advantages

A long-lived roof, requiring a minimum of maintenance.

Its light weight reduces the requirements of the structural steel—(1 sq. ft. of Holorib weighs less than 5 lbs., including insulation and waterproofing). Carries required loads over wide purlin spacing with ample factors of safety.

Makes a firm, smooth and inherently dry mopping surface for the application of insulation and roofing felts. Stays watertight years longer because of the perfect combination of the materials employed.

Quickly laid. Speeds the completion of the building.

May be laid in any weather man can work—nothing to pour, nothing to freeze, nothing to dry out.

Unaffected by atmospheric changes. Expansion and contraction are negligible.

Saves winter fuel. Provides cooler interiors in warm weather.

Saves insurance. Takes a fireproof rating when used over incombustible contents.

Telescoping end laps made over the purlins form tight interlocking joints.

May be welded in place forming a rigid yet self-adjusting foundation for insulation and waterproofing.

Lower in cost than usual types of fire-resistive roofs of the same insulating efficiency.

Provides attractive ceilings. It is not a dust collector.

Does not shrink, burn, warp or dry out.

Insulation

Holorib Engineers recommend that a ½-in. thickness of insulation be applied over their steel roof deck. Our experience indicates most satisfactory results with the pressure-resisting types full-mopped with hot asphalt. Final waterproofing is accomplished with built-up felts, preferably with a surface finish of slag, gravel, or asbestos. Slate or tile may be successfully applied over Holorib decking.

On steep surfaces, DETROIT STEEL PRODUCTS COMPANY will furnish at slight additional cost a new type of self-expanding nail which anchors the insulation to the deck without penetrating the sheet itself. These nails are also of Holorib manufacture.

The insulation applied to Holorib steel deck plates effectively retards the passage of heat in either direction. In this respect the Holorib roof unit with 1 in. of insulation is equal to 24 in. of solid concrete in heat retarding value. This effective insulation reduces fuel consumption and may be taken into account in reducing the amount of radiation and size of the heating plant.

Dry steel will not rust. The insulation applied over Holorib *entirely prevents condensation* caused by the warm air within the building meeting a surface chilled by a colder exterior temperature. As a result, the Holorib roof deck always remains at approximately room temperature well above the dewpoint of the interior air. Accumulation of moisture due to a temperature difference is absent.

With the Fenestra Holorib deck protected with paint from below and insulation above, no injurious corroding action is possible.

With high humidities and temperatures, from 1½ to 2 in. of insulation should be applied in broken joint construction. The ceiling should be given one field coat of paint.

In the average heated buildings, such as machine shops and garages, schools and auditoriums, a 1-in. thickness of insulating material will return a substantial dividend in fuel saved annually, and will prevent any possibility of condensation.

Erection and Engineering Service

The Holorib Division of DETROIT STEEL PRODUCTS COMPANY produces the steel sheets, fastening clips, and (1) will contract to erect the steel deck with their own field force, or (2) furnish superintendence at a moderate charge so that the deck may be applied by the general contractor, or (3) will co-operate with capable and responsible roofing contractors so that the architect and owner may be relieved of all responsibility for the permanence and stability of the roof unit.

Holorib Steel Deck should be erected after all walls, coping and structural steel are in place.

Clips are designed to fasten properly to varying sizes and types of purlins. With 24-gauge and lighter the riveting type with prongs which pierce both upper and lower sheets is employed. With 22-gauge and heavier either piercing or non-piercing clips may be used. The fact that the sheets are pierced has no bearing on their permanence as they are sealed in hot asphalt and are under the insulation.

The holding power of all clips is far in excess of possible inside pressure. Non-piercing clips are made of spring steel with an individual holding power not less than 150 lbs. Piercing clips will carry heavier loads.

Two clips of either type are used per sheet per purlin, spaced alternately 6 and 12 in. apart.

Under average conditions a crew of four men will erect 2500 sq. ft. of Holorib daily.

Framing—

Framing and structural steel are not part of Holorib Steel Deck, unless so specified.

Welding—

At slight extra cost Holorib may be electrically welded to the purlins. Because of its telescoping end lap, Holorib roof deck is easily welded from above. Each individual weld has a holding power tested to 500 lbs. pull without failure. The shape of the rib and the method of erection automatically takes care of any contraction or expansion.

Bearings—

The ends of Holorib sheets must always be supported. Wall bearings should be either raggle, corbel, or purlin spaced approximately 4 in. from the wall. Plans should show details of these sections.

Vents, Stacks and Sumps—

Small openings to accommodate drains are cut in the field after the erection of the deck. If such openings are over 8 in. in diameter, angle bracing should be provided by the steel fabricator to support the sides and ends of the Holorib deck.

Curbs and Sidewalls—

Framing angles both top and bottom should be provided, punched 9 in. on center with $\frac{7}{16}$-in. holes. Holorib is furnished cut to proper size and is bolted to these angles.

Eaves and Gables—

Eave struts should be punched 9 in. on center with $\frac{7}{16}$-in. holes if overhang (limited to 12 in.) is desired. Overhang at the gable (sides) must be supported with lookouts or purlin extensions.

Closures, Flashing and Edging—

Closures, flashing and edging should be applied *after* the insulation is in place and are properly a part of the roofing or sheet metal contract (not roof deck).

However, when the construction of a building is such as to require sheet metal to complete the application of the deck proper DETROIT STEEL PRODUCTS COMPANY will furnish this material. Our proposal will be specific as to the material we will furnish.

Paint—

It is standard practice to furnish Holorib deck manufactured from copper bearing steel sheets dip-coated in a priming coat of battleship gray paint oven dried.

We also fabricate Holorib in galvanized sheets from special tight-coat stock. Extra heavy zinc coatings up to 1.75 oz. per sq. ft. can be rolled without breaking the galvanizing.

In certain occupancies the reflectivity of a galvanized sheet is of value. Field painting, however, is more expensive as the galvanized sheets must be treated with an acid wash before painting. The cost of galvanizing after fabrication is excessive and impractical in specially ribbed sheets. On special order, we will manufacture aluminum Holorib which requires no paint as sheets will not corrode except under extraordinary conditions.

Engineering Data

DEFLECTION TESTS

Ga.	Dist. load in. lbs. per sq. ft.	Measured deflection at purlin spacings of									
		4′ 0″	4′ 6″	5′ 0″	5′ 6″	6′ 0″	6′ 6″	7′ 0″	7′ 6″	8′ 0″	8′ 6″
24	30	.151	.170	....	....	....	....	....	....	....	....
24	40	.190	.247	....	....	....	....	....	....	....	....
24	50	.230	.310	....	....	....	....	....	....	....	....
22	30	....	....	....	.013	.050	....	....	....	....	....
22	40	....	....	.006	.038	.118	....	....	....	....	....
22	50	.010	.062	.145	.200	....	....	....	....	....	....
20	30	....	....	....	....	.031	.071	.103	.300	....	....
20	40	....	....	....	.014	.106	.162	.237	.450	....	....
20	50	....	....	.008	.025	.143	.201	.290	.550	....	....
18	30	....	....	....	....	....	....	....	.230	.265	.285
18	40	....	....	....	....	....	....	....	.310	.350	.380
18	50	....	....	....	....	....	....	....	.405	.440	.485

Deflections shown are the result of tests made on bare sheets by the Testing Materials Laboratory and by qualified engineers of the Case School of Applied Science of Cleveland. Tests made after the application of insulation average 15% greater rigidity.

All tests were made with standard stock sheets of copper-bearing low carbon content steel sheets.

	24G	22G	20G	18G
Section modulus*	.0495	.1670	.1980	.2644
Moment of inertia*	.0124	.1952	.2228	.2924

*The figures above are based on a cross section, 1 ft. wide.

Thermal Conductivity of Holorib—

Including in each case a standard composition roofing:

1. Holorib without insulation ..... 0.781 B.t.u.
2. Holorib and ½-in. insulation ..... 0.358 B.t.u.
3. Holorib and 1-in. insulation ..... 0.232 B.t.u.
4. Holorib and 1½-in. insulation ..... 0.172 B.t.u.
5. Holorib and 2-in. insulation ..... 0.136 B.t.u.
6. 2-in. plank (1¾ in. net) D. & M. when new and joints tight 0.345 B.t.u.
7. 3-in. plank (2¾ in. net) D. & M. when new and joints tight 0.256 B.t.u.
8. 2½-in. poured gypsum on plaster board ..... 0.354 B.t.u.
9. 3-in. poured concrete ..... 0.610 B.t.u.
10. 1⅝-in. cement tile ..... 0.680 B.t.u.

Comparative Roof Weights—

	Lb. per sq. ft.
Holorib:	
Waterproof covering	1.5
1-in. insulation	1.5
Steel deck	1.6 to 2.9
Total approximately	5 lb.
2-in. plank	8
3-in. gypsum	8
Precast concrete	18 to 25
3-in. poured concrete	38

Add 3 to 5 lb. per sq. ft. if slag or gravel is used.

SHEET SIZES, WEIGHTS, LOADS OF HOLORIB DECK PLATES

24 gauge*	4 ft. 3 in. to 10 ft. 3 in., multiples of 3 in. Covering capacity, 16¼-in. effective width
18, 20, 22 gauge†	5 ft. 3 in. to 10 ft. 3 in., multiples of 6 in. Covering capacity, 18⅛-in. effective width

*All laps are made on purlins.
†All telescoping end laps are held within 3 in. of purlins.

WEIGHTS AND CARRYING CAPACITIES

Descriptive Data			Safe Carrying Loads, Holorib Roof Deck			
Gauge	Rib size, in.	Shipping wt. in lbs. per 100 sq. ft. with clips	Gauge	Type	Purlin spacing	Safe load in lbs. per sq. ft.
26*	¾	130	26*	Special	2′0″—3′0″	....
24	¾	170	24	Standard	4′0″—4′6″	45—40
22	1½	235	22	Wide-span	4′6″—5′0″	50—45
20	1½	285	20	Wide-span	5′6″—6′3″	50—45
			20	Wide-span	6′6″—7′0″	45—40
			20	Wide-span	7′0″—7′6″	40—30
18	1½	345	18	Wide-span	7′6″—8′6″	45—35

*Applied inverted for concrete floor forms. Send for complete literature. C. L. 36,000 lb. Classed "Iron & Steel Roofing N. O. I. B. N." 5th C. L., 4th L. C. L.

Add 15 lb. per square to allow for crating on export shipments.
Galvanized or aluminum sheets furnished on special order.

Specifications for Holorib Roofs

I. The roof deck shall be Fenestra-Holorib as manufactured by the Detroit Steel Products Company.

(1) Shall be fabricated from copper-bearing steel of—

(2) State gauge—(U. S. Standard 24, 22, 20 or 18)—

(a) *Note:* If of 24 gauge, ribs shall be not less than ¾ in. deep, spaced 3¼ in. on centers; if of 22, 20 or 18 gauge, ribs shall be not less than 1½ in. deep, with base not less than 1 in. in width. Ribs shall be spaced not more than 6 in. on center.

(3) Shall be dip-painted and oven dried after fabrication or—

(a) shall be fabricated from hot galvanized special tight-coat sheets or—

(b) shall be fabricated from sheets with hot galvanized coating of not less than 1.5 oz. spelter per sq. ft.

(4) The deck shall carry a distributed live load of .... pounds per sq. ft.—

(a) without exceeding 18,000 lbs. of fibre stress per sq. in., or

(b) without causing permanent deflection on the spans employed.

(5) Sidelaps shall be of the interlocking type. Endlaps shall be of the telescoping or interlocking type not less than 2 in. in length and shall be—

(6) Made directly over the purlins in such manner as to eliminate the possibility of asphalt drippage.

(7) The roof deck shall be securely anchored to the purlins not less than 12 in. on center by means of [welding] [manufacturers' standard clips].

II. The insulation shall be of the pressure resisting type—if more than one thickness, the sheet shall be applied in broken joint construction—

(a) On roof surfaces having a pitch less than 3 in. in 12 in. the insulation shall be mopped solidly to the Holorib roof deck with hot asphalt.

(b) On roof surfaces having a pitch 3 in. in 12 in. or more, a high melting point asphalt shall be mechanically stiffened by the addition of 10 lbs. of short asbestos fibre to each 100 lbs. of asphalt to avoid slipping or creeping. With wide span deck, the insulation shall be fastened with Holorib expanding nails using four to each square 10 sq. ft. of insulation board. (With narrow span, the insulation is mechanically fastened with large head, barbed roofing nails.)

III. The waterproofing shall be of the built-up bituminous type for flat or pitched roofs with a surface finish of slag, gravel, asbestos or asphalt. (Where a built-up asphalt waterproofing is used, we recommend not less than 4 plies of all rag felt equal to U. S. Government standard specification No. 86.)

Slate—Tile—Shingles—

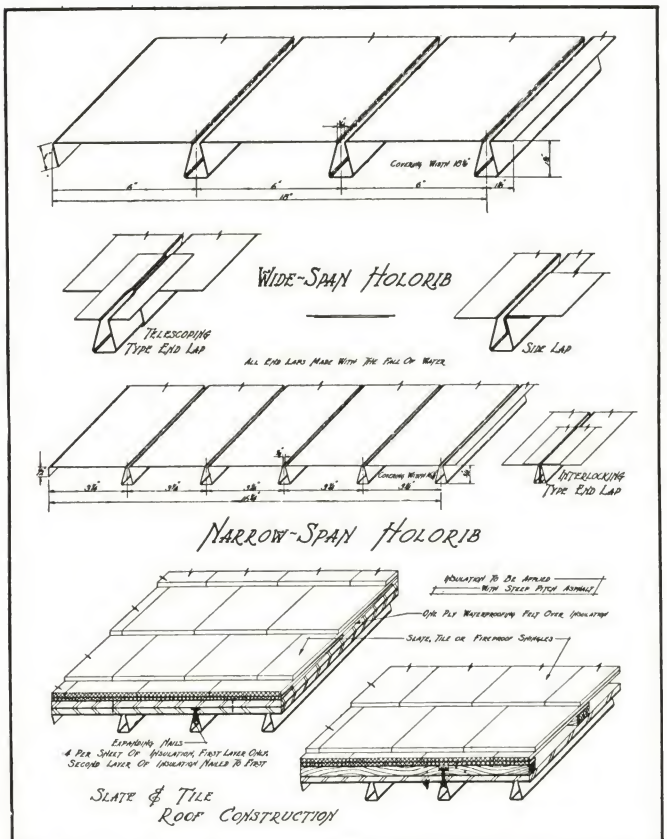
The insulation shall be applied as in specification paragraph II (b). A 15-lb. saturated felt shall be cemented on in hot asphalt.

The slate or tile shall be nailed directly through the waterproofing and insulation, using duck bill, rosin coated, copper nails or nailed to wood nailing strips (plate H101).

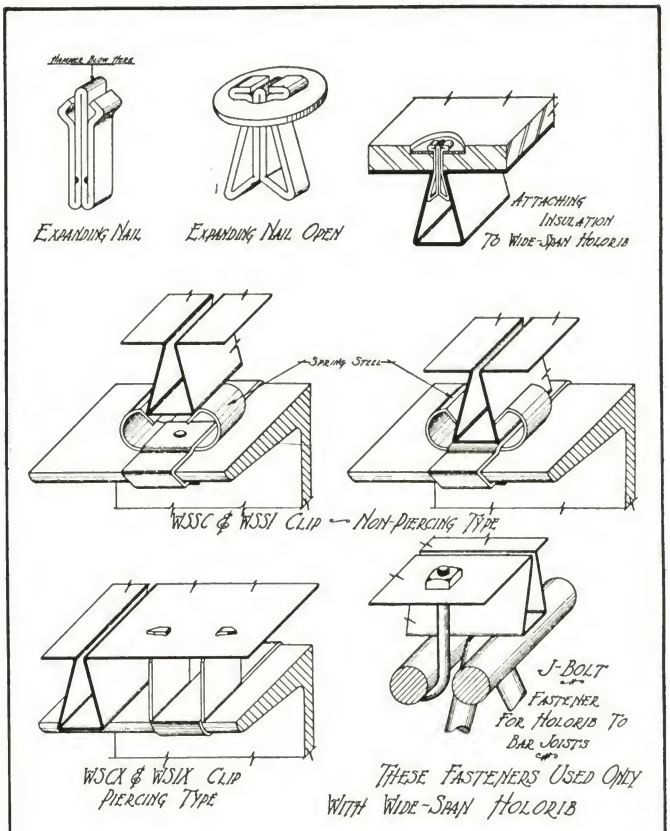
IV. Saddles to carry water to outlets are to be formed from (a) Poured Gypsum; (b) Poured Concrete; (c) Asphalt, Sand and Cement.

All poured saddles are to be formed over the insulating material which has been further waterproofed with one ply of felt or one heavy mopping of asphalt. *In no case should gypsum or concrete saddles be built over the bare deck.* Saddles are part of the general contract and are not a part of the steel deck proper.

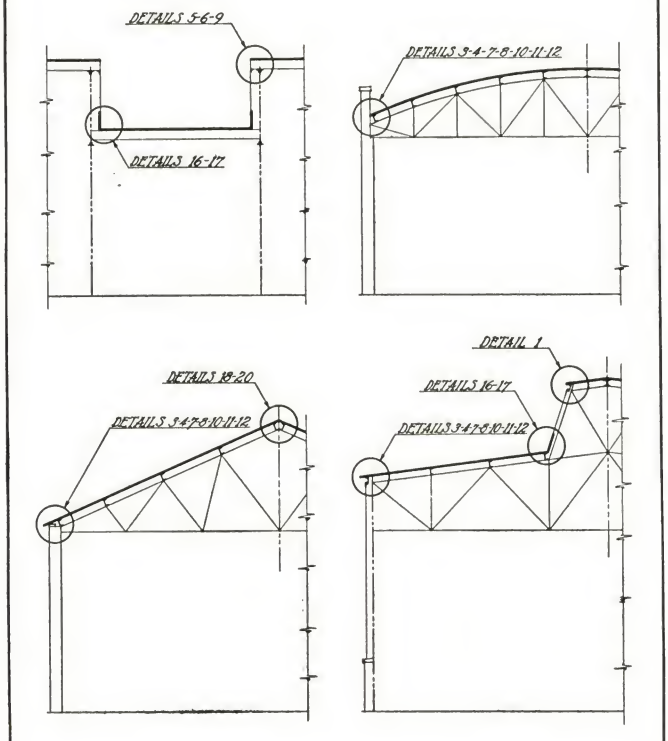
V. We recommend a field coat of aluminum paint after erection. (New galvanized decks must first be treated with an acid wash if paint is to adhere properly.) This painting is part of the general—not the steel roof deck contract.



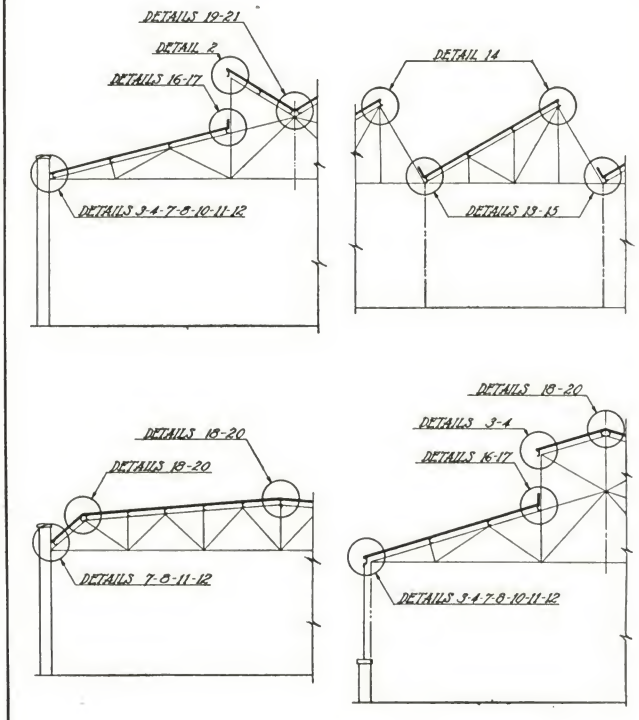
Fenestra HOLORIB | SHEET DIMENSIONS AND STEEP PITCH ROOF CONSTRUCTION | Plate No H-101



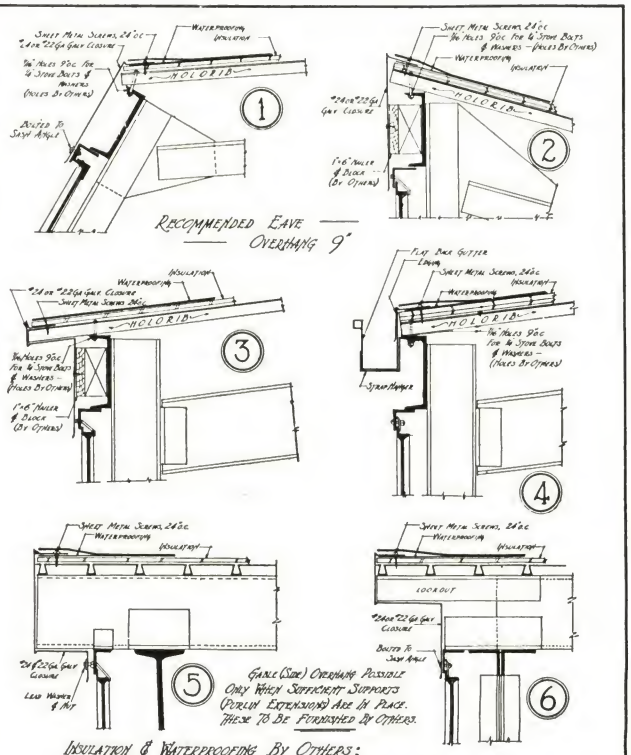
Fenestra HOLORIB | TYPICAL HOLORIB FASTENERS | Plate No H-102



Fenestra HOLORIB | TYPICAL BUILDINGS | Plate No H-103

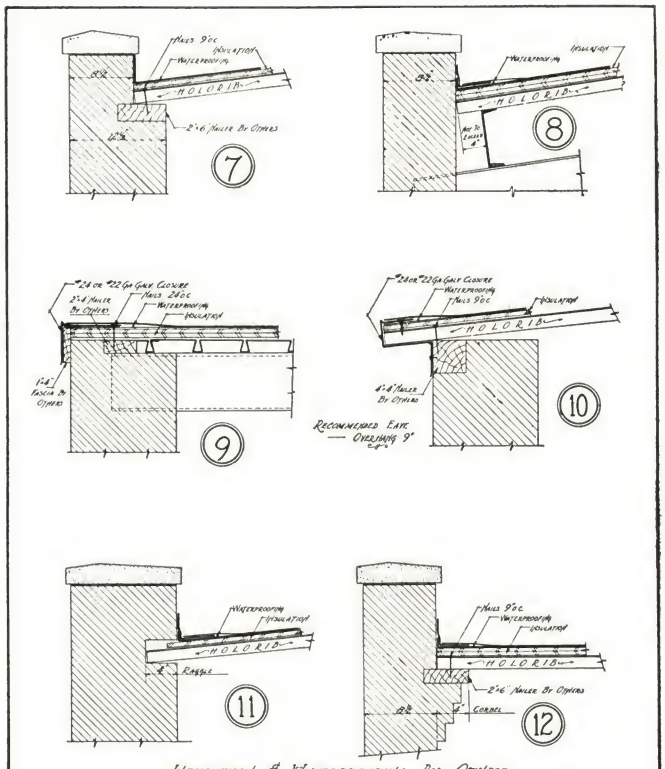


Fenestra HOLORIB | TYPICAL BUILDINGS. | Plate No H-104



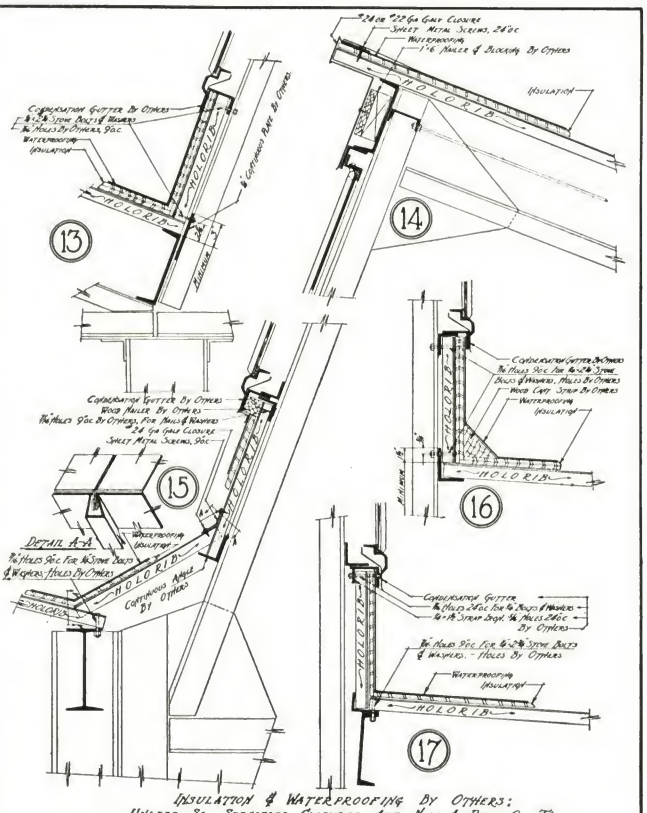
INSULATION & WATERPROOFING BY OTHERS:
UNLESS SO SPECIFIED, CLOSURES ARE NOT A PART OF THE ROOF DECK PROPER & SHOULD BE FURNISHED BY OTHERS

Fenestra HOLORIB — EAVE AND GABLE DETAILS — Plate No H-105



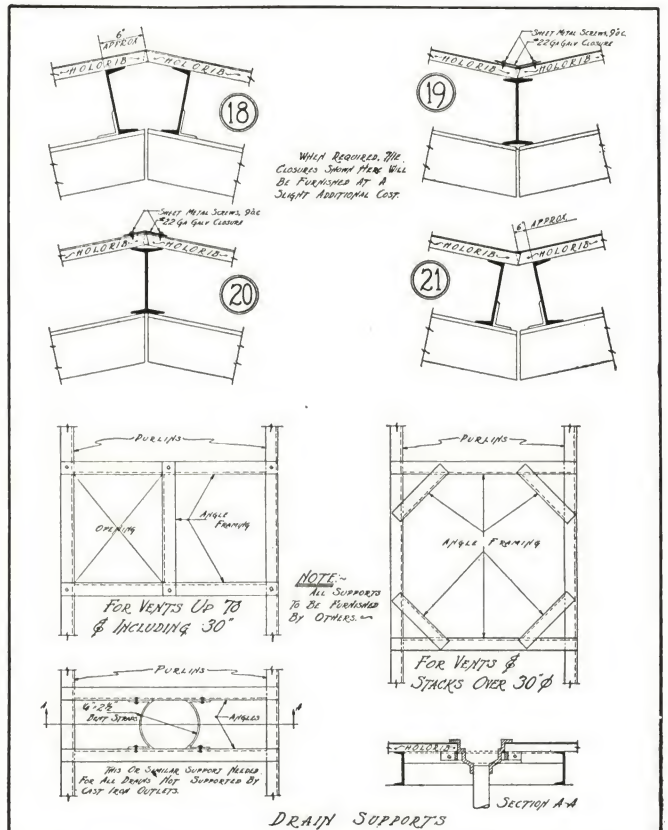
INSULATION & WATERPROOFING BY OTHERS:
UNLESS SO SPECIFIED, CLOSURES ARE NOT A PART OF THE ROOF DECK PROPER & SHOULD BE FURNISHED BY OTHERS

Fenestra HOLORIB — WALL DETAILS — Plate No H-106



INSULATION & WATERPROOFING BY OTHERS:
UNLESS SO SPECIFIED, CLOSURES ARE NOT A PART OF THE ROOF DECK PROPER & SHOULD BE FURNISHED BY OTHERS

Fenestra HOLORIB — SAWTOOTH AND CORB DETAILS — Plate No H-107



DRAIN SUPPORTS

Fenestra HOLORIB — RIDGE, HIP & VALLEY DETAILS SUGGESTED FRAMING FOR OPENINGS — Plate No H-108

IRONCLAD COPPER STEEL ROOF DECK

EXCLUSIVE MANUFACTURERS

HALL-HODGES COMPANY, INC.

807-813 Citizens Bank Building, NORFOLK, VA.

Ironclad Roof Decks

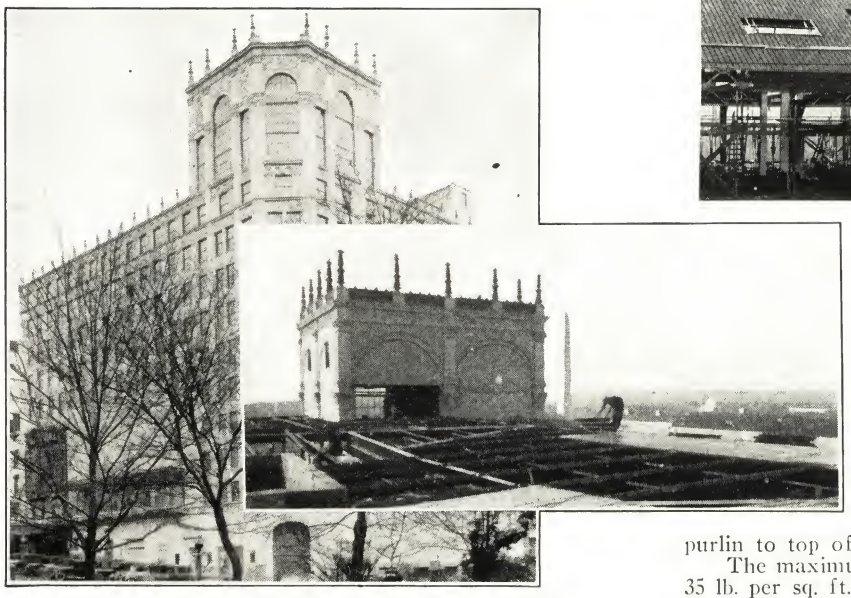
Ironclad Copper Steel Roof Sheets are designed for unusual strength in roof deck construction. This design permits a longer span between purlins without a corresponding excess of weight, and to be practically as inexpensive as good wood construction.

Ironclad Copper Steel Roof Sheets provide ample support for a generous thickness of insulating material. The permissible longer spans between purlins (approximately 6 to 8 ft.) and the light weight of Ironclad (approximately 7 lb. per sq. ft. including steel purlins) effect substantial savings in the cost of the supporting framework. The unusual strength and permissible longer spans are due to the deep rib and the seat construction. The deep ribs assure strength and the seat assures rigidity under all conditions. In forming the Ironclad sheet, the metal is never bent to a degree injurious to the steel.

Steel roofing, because of its strength, economy in cost, fire resisting qualities and long lived service, has earned merited recognition in all types of construction.

Ironclad for All Types of Roofs

Ironclad Copper Steel Roof Sheets are adaptable to any type or shape of roof. They have been most successfully used for roofing theaters, hospitals, industrial buildings, hangars, etc. Ironclad may be used on flat, sloping, gable, hip, French, sawtooth and special types of roofs.



Ironclad Roof on Earl Theatre, Washington, D. C.

Advantages of Ironclad Roof Decks

Spans—Ironclad will span from 6 to 8 ft. between purlins, requiring a very small amount of structural support per square foot of roof.

Weight—Due to its deep rib and effective seat, Ironclad is very strong but light in weight.

Expansion and Contraction—The effective methods of fastening Ironclad distribute expansion and contraction over the entire roof area uniformly.

Permanency—Ironclad is made of rust resisting copper steel with a baked-on coat of paint, or can be supplied in galvanized copper steel.

Unusual Conditions—Ironclad fastenings, clips and other appurtenances take care of even unusual conditions.

Economy—Ironclad Roofs are practically as cheap in place as good wood construction. They are easily and quickly placed, effecting a saving in time and labor. Light weight and longer span save money on framing.

Ironclad Roof Deck Application

(1) The ends of the sheets always come over supports and lap over as much as desired, but never less than 2 in. Side laps are a full rib deep (2 in.) and make a waterproof joint.

(2) The sheets rest on pressed steel seats which support the sheets on the flat portion between ribs and not on the rib. These seats act as spacers and rigidly hold the roof to the purlins, and also act as stiffeners for the ribs. The seats are provided with bent sides fitting closely and clamping to the purlins for their entire length.

(3) The sheet is fastened to the seat with our special metal clip or hardened steel screws.

(4) Over the top of the steel deck, insulation of any of the many well-known brands of insulating boards or porous gypsum insulation is placed, after thoroughly mopping the surface of the roof with asphalt. Over the insulation, of any thickness desired, waterproofing in form of built-up roofing, slate, or tile, is placed on any type roof on any slope desired.

(5) On steep slopes metal screws and washers are furnished to hold the insulation and wood nailing strips for nailing the slate or tile.

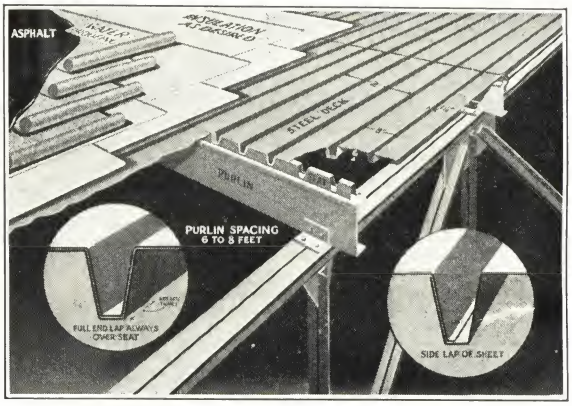
Ironclad Used on Sloping Roof

Designing Information

Ironclad Copper Steel Roof Sheets are furnished in 24, 22, 20, 18 and 16 gauge. Each sheet is 2 ft. wide and lengths are 5, 6, 7 or 8 ft. and lap is optional but should not be less than 2 in.; consequently each Ironclad sheet covers a roof area equal to its own length in feet less 2 in. (or the lap allowed) multiplied by 2 ft., or the full width of the formed sheet. Ribs are full 2 in. in depth, spaced 8 in. center to center. The seats are 2¼ in. in depth so the distance from top of purlin to top of deck is 2¼ in. plus thickness of sheet used.

The maximum span for 24 gauge sheet with a live load of 35 lb. per sq. ft. is 4 ft. 10 in., 5 ft. 10 in. for 22 and 6 ft. 10 in. for 20 gauge.

Ironclad with insulation and built-up roof on top of purlins weighs approximately 5 lb. per sq. ft.



Typical Roof Construction Showing Ironclad Roof Deck

Specifications

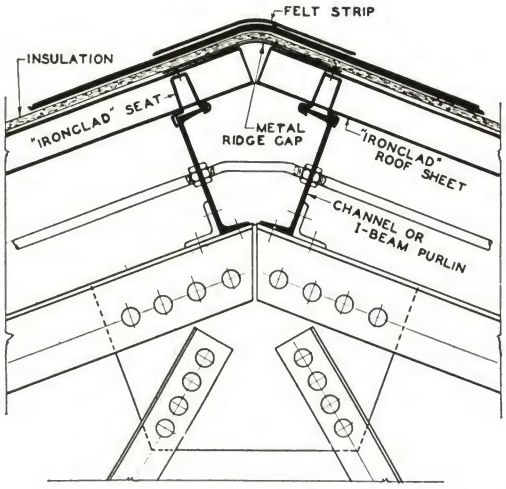
Roof Sheathing—The roof sheathing shall be Ironclad Copper Steel Plates with ribs not less than 2 in. deep or more than 8 in. from center to center of ribs. The plates shall be supported by pressed copper steel seats securely held to the purlins. All joints shall come over supports. The ribs shall be formed with bends not exceeding 90° and all corners shall have a radius of not less than twice the thickness of the sheet. The sheet shall be fastened to the pressed steel seats with clips or other suitable means, permitting expansion and contraction without deformation of the sheet. The sheets shall overlap at the ends for their entire width and depth, not less than 2 in. and for their entire length not less than the depth of one rib.

The sheets shall be made of.....gage metal to fit purlin spacing of.....ft.....in. Sheet materials for the roof shall be coated with a baked-on shop coat of preservative paint.

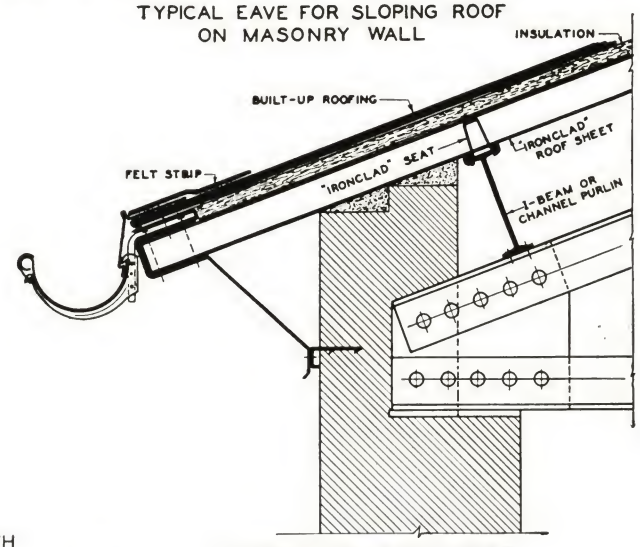
Insulation—The sheathing shall be insulated with.....of a thickness of not less than.....embedded in high temperature asphalt, and on slopes over 3 in. to the foot shall be fastened with metal screws and washers, using not less than one screw for each 4 sq. ft. of insulation.

Waterproofing—(Usual type of specification). If slate or tile roofing is to be placed over the insulation, suitable nailing strips shall be fastened through the insulation into the roofing sheet with metal screws.

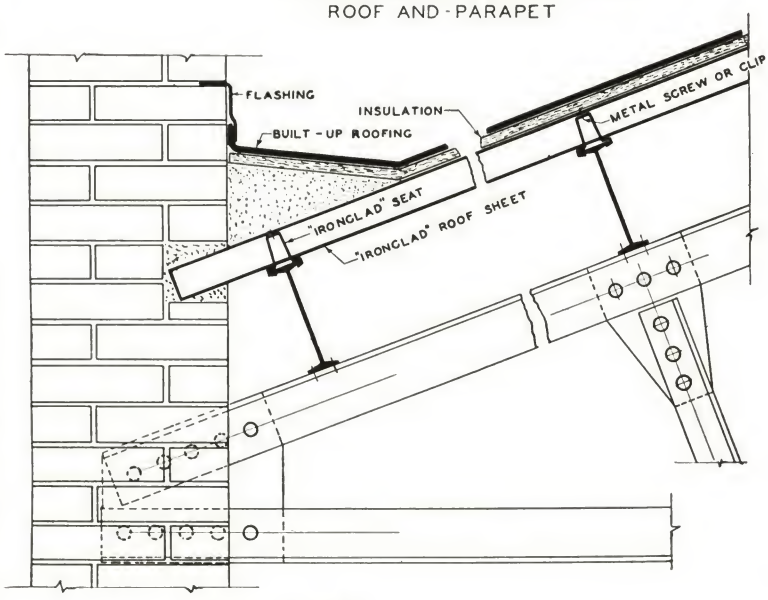
TYPICAL RIDGE



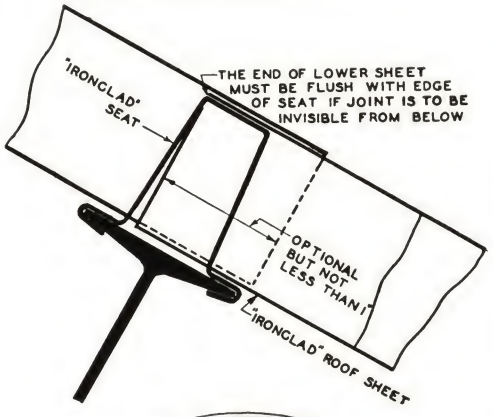
TYPICAL EAVE FOR SLOPING ROOF ON MASONRY WALL



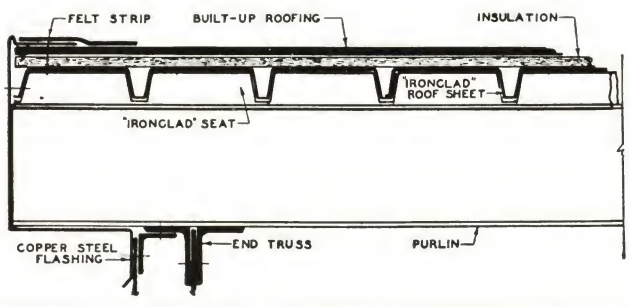
TYPICAL GUTTER DETAIL WITH ROOF AND PARAPET



CONNECTION OVER SEAT



TYPICAL GABLE



Laying Insulation Over Ironclad Roof

PAN METAL ROOF DECK CO.

Manufacturers of Pan Metal Roof Deck and Acoustical Backing

AKRON, OHIO

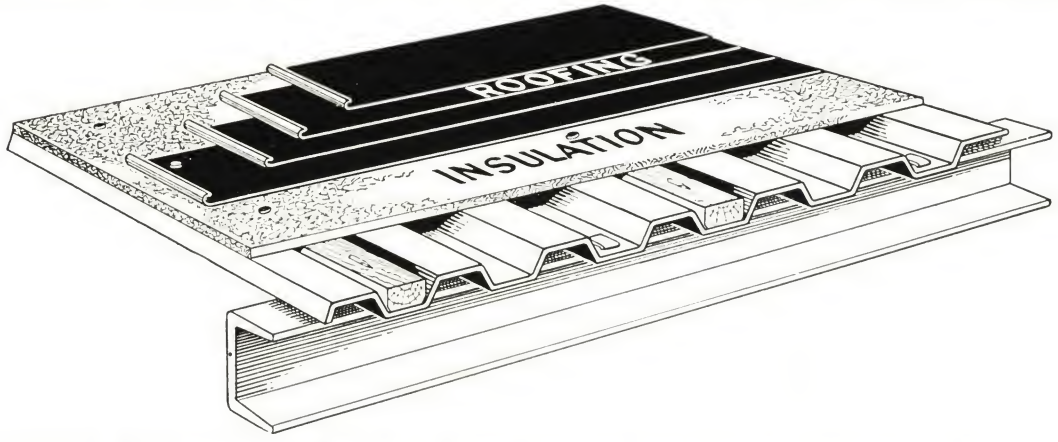
PAN METAL ROOF DECK

Pressed Steel Construction

Pan Metal Deck consists of a pressed steel unit 24 ins. wide, in lengths up to 12 ft. The shaping in powerful presses assures uniformity in size and shape of pans which, when laid, fit snugly at the ends and side laps. The mechanical action of *pressing* steel into shape, moreover, results in an increased rigidity and tensile strength of the metal.

Light Weight

Pan Metal Roof Decks are fire-safe, but much lighter and more economical than the materials often used in fire-safe construction—therefore they require lighter supporting members. The weight of Pan Metal Roof construction for the average spacing of purlins, and ½ in. of insulation with a four-ply built up roofing, is less than 5 lbs. per sq. ft.



Tried and Proved Principles of Construction

The principles used in making Pan Metal Decks are not new. By methods tried and proved in their forty years of experience as roofers, the makers of Pan Metal Deck have produced a roof deck designed to meet the needs of present-day construction.

Standard Pan Metal Deck is made of *galvanized steel,* as usage has proved that galvanizing gives a protective coating which adds to the permanence of steel.

The nailing of insulation and roofing to wood deck has long been an established practice. Pan Metal Deck applies this method to pitched, as well as flat roofs, by means of white pine nailing strips spaced 12 ins. on centers attached to the deck on fabrication. The nailing of insulation to steel deck by means of these wood strips has proved superior to pasting as it eliminates any tendency of the insulation *to bulge, slip or crawl* due to excessive temperatures.

Can Be Laid in Any Weather

No weather delays occur when Pan Metal Roof Deck is used, for it can be laid and roofed in zero weather.

Load Capacity By Test

Following is an extract from a report of tests on Pan Metal Roof Deck to determine the limit of elasticity under load, made by the University of Pittsburgh:

"These specimens were tested by applying a dry sand load in increments of five pounds, uniformly distributed, and measuring the deflections at the center of the span.

These specimens were all tested beyond the point where the deflection exceeded 1/250 of the span and in no case was there any indication that the elastic limit of the material had been reached or that the deck had been injured in any manner."

A Condensed Loading Table

A condensed loading table, worked out from University of Pittsburgh tests, is given below for handy reference.

The maximum deflection for the load is less than L./250.

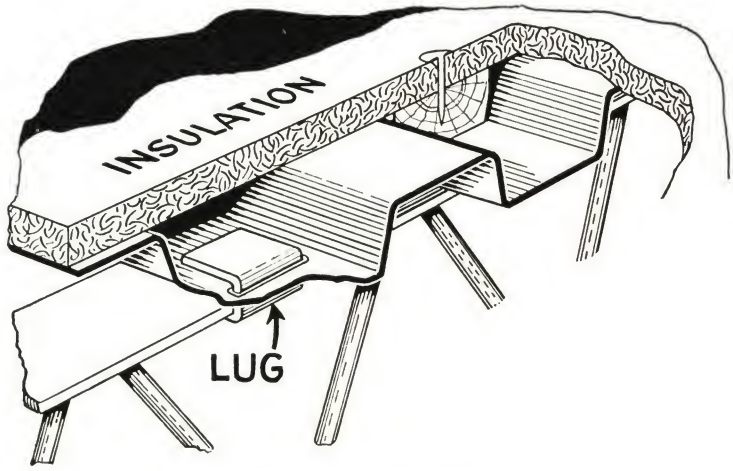
Span	Gauge	Pan depth	Live load per sq. ft., lbs.	Weight per square, lbs.
4′ 0″	24	⅞″	96	180
4′ 6″	24	⅞″	72	180
5′ 0″	24	⅞″	60	180
5′ 6″	22	⅞″	55	205
6′ 0″	20	⅞″	50	240
6′ 0″	24	1⅛″	50	190
6′ 6″	22	1⅛″	45	228
7′ 0″	20	1⅛″	53	265
7′ 6″	20	1⅛″	46	265
8′ 0″	20	1⅛″	40	265

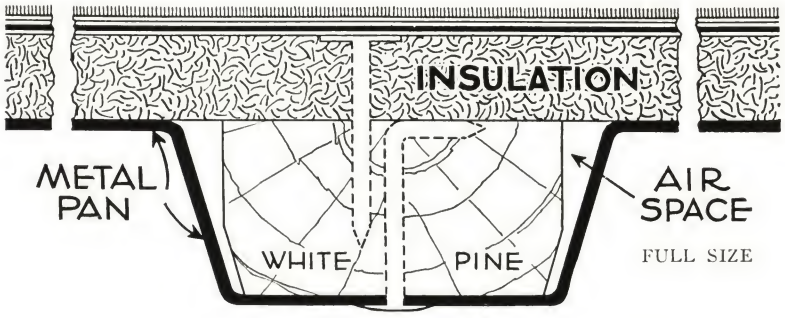
Erection

Pan Metal Roof Deck is securely fastened to the purlins, regardless of where they occur, by a simple, self-locking clip, without the use of any special tools.

As shown by the illustration, a small slot is made in the deck at the purlins, with a thin ¾-in. cold chisel.

The L-shape ¾x⅛-in. lug is then dropped in the slot, with the leg down. The flat side is held firm with a dolly while the workman kneels on the deck and reaches underneath, bending the clip to the purlin with a hammer. The clip is then locked in place and no amount of jarring will work it loose.





PAN METAL ACOUSTICAL BACKING

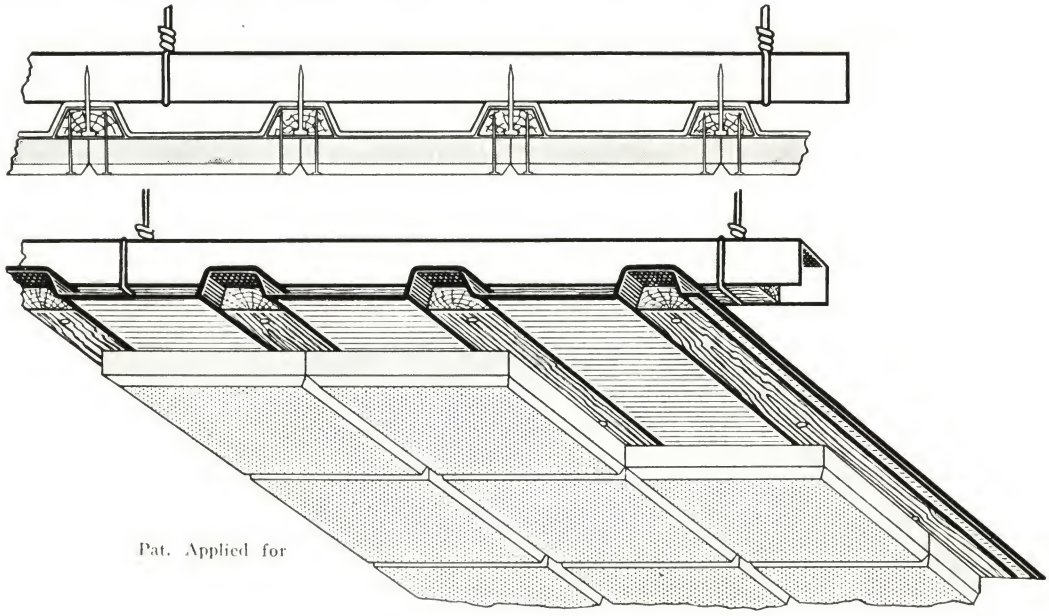
Consists of two units: the Hanger Channels, which are 1⅝x1⅝-in. white pine covered on three sides with galvanized iron and are spaced 4 ft. or 5 ft. on centers with the wood surface down.

The Acoustical Backing, which is nailed to the hanger channels, is made of galvanized iron with pans spaced 12 ins. on centers containing ⅞x2¾-in. white pine nailers. The backing is 2 ft. wide, in any length up to 10 ft. 2 ins. When the hanger channels are spaced 4 ft. on centers the length would be 8 ft. 2 ins. The 2 ins. is for the lap which is made at the hanger.

Special acoustical backing can be fabricated for various tile designs and widths of tile other than 12 ins. wide. The tile when nailed in place fits snug against the metal backing making an effective seal against breathing.

The rigidity and nailing features of Pan Metal Acoustical Backing makes ideal construction in buildings subject to vibration. This is especially true in gymnasiums where basket balls and indoor baseballs frequently come in contact with the acoustical treatment.

Pan Metal Acoustical Backing is the result of a need for a secure base for acoustical tile and has the approval of leading manufacturers of acoustical tile.



Pat. Applied for

H. H. ROBERTSON COMPANY

Robertson Protected Steel Decks, Under Insulated and Built-up Roofs, and V-Beam Roofing

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CAN.; ELLESMERE PORT, CHESHIRE, ENG.

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CANADA: H. H. ROBERTSON CO., LTD., TORONTO, ONT., AND MONTREAL, QUE.

Products

ROBERTSON V-BEAM PROTECTED STEEL ROOF DECKS for use under insulated or built-up roofs; ROBERTSON V-BEAM ROOFING for use as a self-contained roof without additional insulation.

Robertson V-Beam Roofing and Siding Sheets are protected by United States Patent No. 1277755, September 3, 1918; other United States and foreign patents issued and pending.

TRADE-MARK

For Robertson Protected Metal (RPM) Roofing and Siding, Glazing Construction, Skylights, Monitor, Sidewall and Special Sash, Double Glazing and Ventilators, see Manufacturers' Index.

ROBERTSON V-BEAM PROTECTED STEEL ROOF DECKS

Uses of Robertson V-Beam Sheets

The Robertson V-Beam Sheet is a protected steel sheet corrugated into deep, angular V-shapes which give it greater strength than the standard forms of rounded corrugations. Its action under load compares closely to the laws of beam deflection.

(For the manner in which V-Beam sheets are protected from corrosion, see section entitled "Elimination of Corrosion.")

The V-Beam sheets are used: (1) As a steel deck under insulation and built-up roofing. (2) As a self-contained roof without insulation or built-up roofing. (3) As a permanent form for concrete slab work.

Types of Construction

Robertson V-Beam Steel Decks can be used on all types of industrial buildings and factories, on commercial garages, powerhouses, airplane and dirigible hangars, etc.

As a permanent form for concrete, it is used for concrete slab roofs, floor construction, bridge floors and sidewalks, shipping platforms, conveyor bridge decks and other purposes.

General Advantages of the Steel Roof Deck

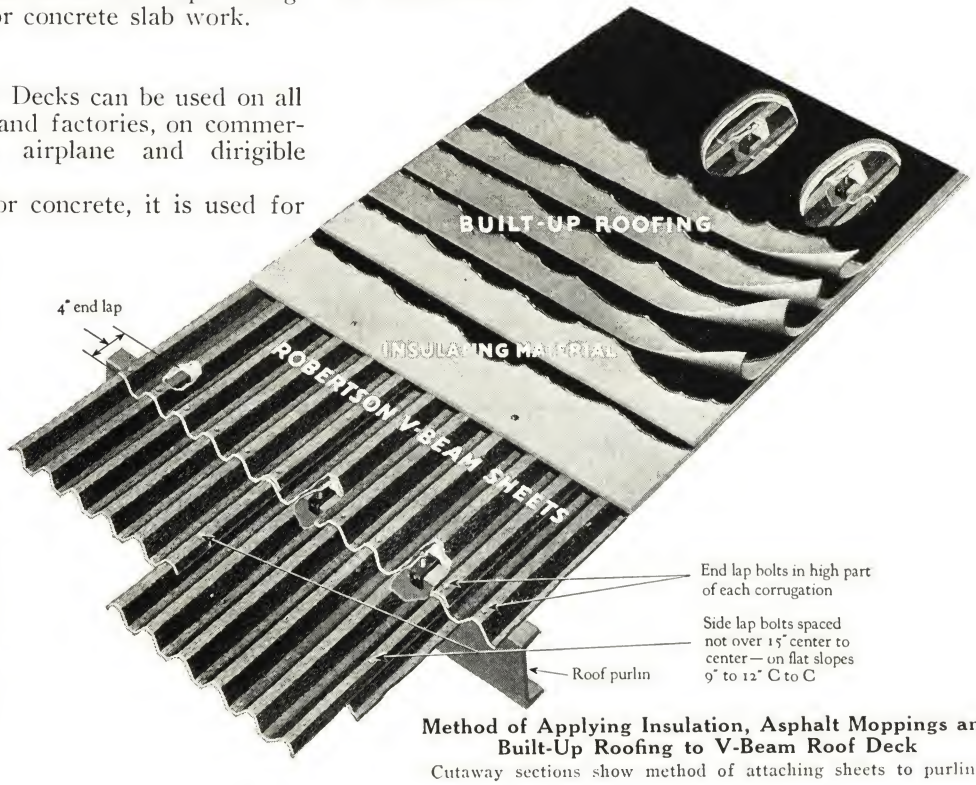
The steel deck has won wide popularity for use under insulation and built-up roofing (1) because it is lighter than many of the older forms of deck construction; (2) because it will not absorb moisture and will not warp or swell; (3) because there is no movement of the deck to cause stretching or splitting of the built-up coatings.

Specific Advantages of the Robertson V-Beam Steel Deck

The Robertson V-Beam Protected Steel Sheets have removed the susceptibility to corrosion which was the only weakness of the steel deck. They have given the steel deck these advantages:

(1) **Rust and Corrosion Proof**—They make a roof deck that is rust and corrosion proof even in the presence of destructive chemicals, smoke, steam, etc.

(2) **No Maintenance Required**—They make a roof deck that does not require painting or other forms of maintenance.



Method of Applying Insulation, Asphalt Moppings and Built-Up Roofing to V-Beam Roof Deck

Cutaway sections show method of attaching sheets to purlins

(3) **Greater Strength**—They provide greater strength. This makes it possible to span wider purlin spacings, thus reducing the number of supporting purlins required and reducing the amount of structural steel.

Elimination of Corrosion

The Robertson V-Beam Roof Deck is made of Robertson Protected Metal (RPM) and possesses the same freedom from corrosion that has made RPM a favorite material for roofing and siding of buildings where corrosion is a factor. Robertson V-Beam Roof Decks need no paint because they are protected by the only unfailing method of rustproofing, which is *permanent external coating.* There are three layers of these external coatings on each Robertson V-Beam Sheet. They are: (1) asphalt; (2) asbestos felt, and (3) a heavy waterproofing envelope. Both asphalt and asbestos are inert in the presence of chemical agencies and moisture. Coverings last indefinitely. These coatings cover sheets completely—top, bottom, sides and ends.

Contraction and Expansion

The core sheet of the V-Beam Steel Deck is steel and it therefore has the same co-efficient of expansion as the structural steel of the building. The external coatings on the sheets are semi-plastic and adhere firmly to the sheets during expansion and contraction. The corrugated design of the sheets enables them to take up all the movement of expansion and contraction without disturbing the insulation or the built-up roofing.

Condensation

Sufficient thicknesses of insulating board can be applied to provide any desired degree of insulation. The Robertson V-Beam Deck itself has great natural insulating value because of the external layers of coating on each sheet. The heat insulating value of all Robertson Protected Metal is more than twice that of unprotected metal. (The actual difference is: R.P.M.: 0.9 B.t.u. per hour per square foot, for each degree of temperature difference; unprotected metal: 2.13 B.t.u.)

COEFFICIENTS OF THERMAL CONDUCTIVITY OF VARIOUS FORMS OF ROBERTSON PROTECTED METAL CONSTRUCTION AS COMPARED WITH TWO OTHER FAMILIAR FORMS OF CONSTRUCTION

Form of construction	Coefficient
(1) RPM Roofing; all forms of corrugations; used without other composition roofing or insulating materials—	
Laps not cemented	.90
Laps cemented	.80
(2) RPM Siding; all forms of corrugations; used without other materials; laps, standard construction	.80
(3) RPM Roofing or Siding; 2 sheets RPM with insulating board between—	
With ½-in. insulating board	.26
With ¾-in. insulating board	.22
With 1-in. insulating board	.18
With 1½-in. insulating board	.14
With 2-in. insulating board	.11
(4) RPM Roofing as a deck sheet with composition roofing and insulating board—	
With ½-in. insulating board	.28
With 1-in. insulating board	.20
With 1½-in. insulating board	.16
With 2-in. insulating board	.13
(5) RPM Cover Sheet; roofing or siding; closely-spaced purlins or girts supporting insulating board, exposed on inside, with RPM Cover Sheet outside to weather—	
With ½-in. insulating board	.37
With 1-in. insulating board	.24
With 1½-in. insulating board	.18
With 2-in. insulating board	.14
(6) Corrugated Unprotected Steel Roofing, conventional construction	2.13
(7) ⅜-in. or ⅞-in. Rough Roofing Boards with ready roofing	about 1.0

*The coefficients given above are B.t.u., absorbed, transmitted and emitted, per square foot, per hour, per degree F. temperature difference outside and inside air, and are for still air conditions.

Note: The values given will vary ± 10% depending upon the perfection of workmanship in construction, and upon the men and methods of making the determination of the coefficient.

Values given in items 3 to 5 do not include the insulating effect in the low corrugation under the insulating board, an air space which exists over 80% of the entire area of the RPM and which has value as an insulator.

Gauges and Spans

Robertson V-Beam Sheets are available in the following gauges—24, 22, 20 and 18. The spans over which the various gauges should be used to secure the utmost economy are given below:

Length of span, ft.	in.	V-Beam Sheet	
		Gauge	Length, ft.
4	9	24	10
5	3	24	11
5	9	24	12
6	6	24	7
7	6	22	8
8	6	20	9
9	6	18	10

Note: The figures above are based on a 30-lb. load, with a limiting deflection not exceeding 1% of the span length.

Lengths

Robertson V-Beam Sheets are standard in even foot lengths from 5 to 12 ft. and are also available in intermediate lengths when required.

Weights

Dead load (V-Beam roofing, uninsulated) 3 to 5 lb. per sq. ft.

Dead load (V-Beam roofing, insulated) 5 to 7 lb. per sq. ft.

Building Codes

Robertson V-Beam Sheets conform to the laws of beam calculations and can therefore be designed to meet any building code requirements.

Width, Covering Area, Laps

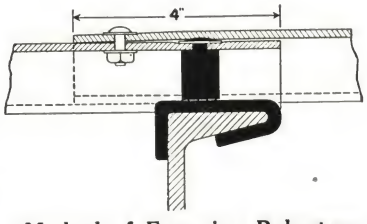
The cross-section on the next page shows the width, net covering width, and lap of the Robertson V-Beam sheets.

Erection

Erection of V-Beam sheets is done by the roofer or sheet metal man, or, if you wish, by erection engineers of the H. H. Robertson Company. The same workmen can frequently apply the insulation and waterproofing as well as erect the V-Beam sheets. Complete erection instructions will be furnished by the Robertson Company to the local contractor or roofer.

Method of Fastening V-Beam Sheets

The fastening method developed for use with Robertson V-Beam Sheets is extremely strong and durable. The V-Beam Sheets are attached to the purlins with rivet clips, which hook around the purlins as illustrated in the cross-section. The rivets are drawn through the high corrugations of the sheets with a simple riveting tool and hammer.



Method of Fastening Robertson V-Beam Sheets to Roof Purlins

The hook end of the rivet clip fastens under top leg of the purlin. The other end of the clip is bent down over the purlin with a hammer. All rivet heads are covered by the adjoining sheets

Applying Insulation and Built-up Roofing

The usual procedure for applying insulation and built-up roofing is followed. Rigid board insulations are recommended. If one layer of insulating material is used, it is bolted directly to the V-Beam Sheets. If additional layers are used, the multiple layers are stapled together or are monolithic and are mopped with asphalt and bolted to the deck as a unit.

The upper layer of insulation is mopped with asphalt to receive the first layer of built-up roofing. The successive layers of built-up roofing are applied in the usual manner. Complete specifications for application of insulation and built-up roofing will be sent on request.

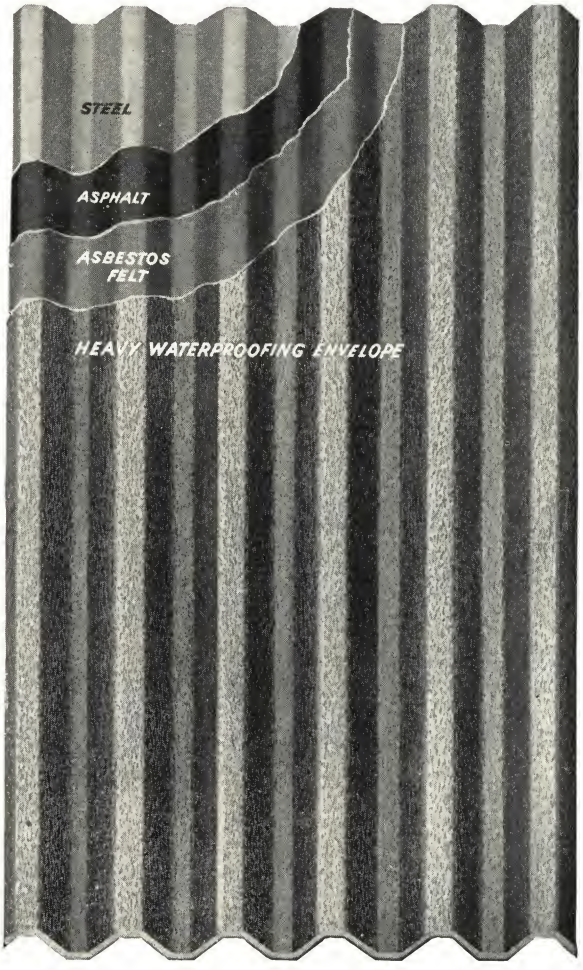
V-BEAM SHEETS AS SELF-CONTAINED ROOFS WITHOUT INSULATION

The V-Beam Sheets are being widely used in place of ordinary forms of corrugations for roofs without insulation or built-up roofing. They are being chosen (1) because the sheets with their deep angular V-shaped corrugations, are one of the strongest forms of corrugated metal that has been developed (see load-carrying tables at right); (2) because the shape of the corrugations makes a roof of very attractive appearance, and (3) because of their greater drainage capacity.

They are used in buildings where the architect or engineer wishes to reduce the number of purlins, either for lightness or appearance, in buildings with long spans without requiring intermediate purlins. The strength of the sheets permits savings in the structural steel and in the weight of foundations, etc.

In addition to their strength, the Robertson V-Beam Sheets have complete freedom from corrosion even in plants where fumes, acids and other destructive agencies are prevalent. The V-Beam Sheets need no painting nor other maintenance to keep them free of corrosion.

Further information about the use of V-Beam Sheets on sloping roofs will be sent on request.



Robertson V-Beam Sheet

Showing the protective coverings on the steel sheet which prevent corrosion. These sheets are supplied in even foot lengths, from 5 to 12 ft. inclusive. Intermediate lengths can be furnished wherever required.

TABLES OF LOAD-CARRYING CAPACITIES OF ROBERTSON V-BEAM SHEETS

Gauge U.S.S.	24	22	20	18
Thickness of core sheet	0.025″	0.03125″	0.0375″	0.050″

Table No. 1—Where Simple Beam Conditions Exist

Span lengths	D	Safe loads—pounds per square foot uniformly distributed			
4′ 0″	.14	88	110	130	175
4′ 6″	.18	70	87	104	140
5′ 0″	.22	56	71	85	110
5′ 6″	.26	47	59	70	93
6′ 0″	.31	39	49	59	78
6′ 6″	.36	33	41	50	67
7′ 0″	.42	28	36	44	57
7′ 6″	.48	25	31	38	50
8′ 0″	.55	21	28	33	44
8′ 6″	.62		24	30	39
9′ 0″	.70		21	26	35
9′ 6″	.78			23	31
10′ 0″	.86	D = Deflection in inches at center of span under the tabular loads shown here.			29
10′ 6″	.95				25

Table No. 2—Where Semi-continuous Beam Conditions Exist
(For description of semi-beam conditions, see Note A below)

Span lengths	D	Safe loads—pounds per square foot uniformly distributed			
4′ 0″	.18	110	138	165	220
4′ 6″	.23	86	109	130	175
5′ 0″	.28	70	88	105	140
5′ 6″	.33	59	72	86	115
6′ 0″	.39	48	63	72	98
6′ 6″	.45	41	52	63	83
7′ 0″	.53	34	44	54	71
7′ 6″	.60	31	38	47	63
8′ 0″	.69	26	34	41	54
8′ 6″	.78		30	36	48
9′ 0″	.88		26	32	42
9′ 6″	.98			28	38
10′ 0″	1.08	D = Deflection in inches at center of span under the tabular loads shown here.			34
10′ 6″	1.19				31

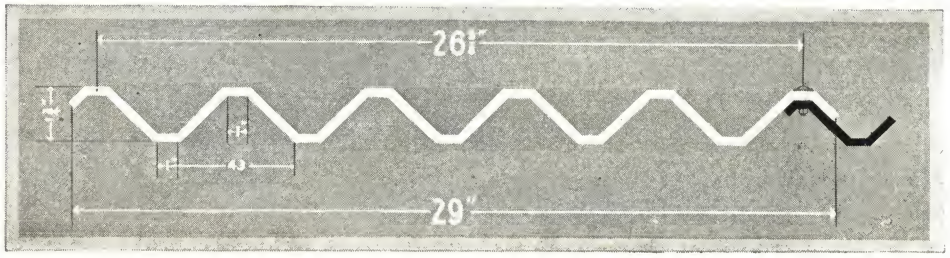
Note A: Where multiple spans exist, requiring the use of single sheets over each span, and where ends of sheets are securely anchored to the supports and to each other; or where multiple spans exist and one sheet length may extend over two or more spans and be securely anchored to the several supports; or, where a combination of these conditions exist, the experimental data yielded the fact that there was a consistent increase in strength beyond the simple beam conditions which was worth considering, and that the bending moment could be calculated viz.:

$MB = \frac{1}{10.6} Wl$ and the deflection viz.: $d = \frac{4}{384} \frac{W}{E} \frac{l^3}{I}$. To simplify calculations, besides getting an additional factor of safety, Table No. 2 has been calculated using $MB = \frac{1}{10} Wl$ and $d = \frac{5}{384} \frac{W}{E} \frac{l^3}{I}$.

Dimensional Details of the Robertson V-Beam Sheet

Note that the steel is nowhere bent back upon itself. None of the bends involve "drawing" in the steel.

The standard sheet is 29 in. wide, with a net covering width of 26⅜ in.



V-BEAM SHEETS AS PERMANENT FORMS FOR CONCRETE SLAB WORK

The V-Beam sheets offer many advantages when used as a permanent form on steel beam supports for roofs, floors, etc. Among these advantages are:

(1) Construction is rapid.

(2) Carpenters are eliminated, the danger of fire from wood-forms is removed, and shrinkage and warpage are prevented.

(3) The deep V-corrugations eliminate one-half or more of that portion of a concrete slab which is in tension (which is, of course, the weakest portion of concrete). There is a saving of as much as 20% to 40% in the quantity of concrete, with a corresponding saving in the dead weight on the framework, and economies in the structural steel and the foundations.

(4) The space required for storage and work space for form work is reduced.

(5) The V-Beam Sheets provide a good temporary protection over other work and equipment, and the actual concrete slab work can thus be delayed until the most favorable time for it.

(6) Since there are no forms to be stripped away, the work is not delayed.

(7) There is no leakage of grout through form cracks.

(8) No finishing is required on the underside of the slab; and there is no spalling or dusting of the ceiling to spoil products in process of manufacture.

(9) The V-Beam Sheet is corrosion-resistant and can be used where chemical conditions are bad.

(10) The high corrugations permit wiring, piping, etc., to be placed in the plane of floor slab and yet to be accessible. This increases the overhead clearances.

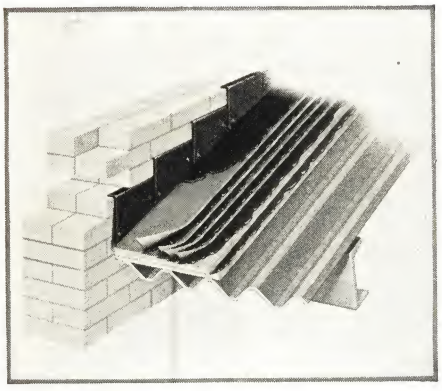
TABLES SHOWING SLAB DESIGN AND LOAD CARRYING CAPACITIES FOR CONCRETE SLABS USED WITH ROBERTSON V-BEAM SHEETS AS PERMANENT FORMS

Distance center to center of supports, ft. in.	Dead load of V-beam and concrete in lb. per sq. ft. uniformly distributed (see sketch)	Gauge of V-beam required to carry dead load and expected deflection under the quiescent dead load		Slab reinforcing		Live load carrying capacity of slab only, lb. (V-beam takes all dead load)	Estimating data		Equivalent slab of ordinary wood-form work to carry same live load plus dead load			
		Gauge	Deflection, in.	Size of rods	Size of mesh		Cu. yd. of concrete per 100 sq. ft. weather area	Reinforcing rods and mesh per 100 sq. ft. weather area	Slab thickness, in.	Cubic yd. per 100 sq. ft. weather area	Reinforcing per 100 sq. ft. weather area, lb.	Dead load on supporting construction, lb.
4 0	35	24*	.07	⅜ in. round spaced 5¼ in. c. to c.	Across corr. No. 12 wires 4 in. ctrs. Parallel to corr. No. 14 wires 8 in. ctrs.	420	.77	Rods, 95 lbs. Mesh, A.S.&W. Co. No. 036P, 17 lb.	3⅜	1.05	110	42
4 6	35	24*	.11			330	.78		3⅜	1.05	110	42
5 0	36	24*	.17			270	.79		3½	1.10	110	44
5 6	36	22*	.19			225	.80		3½	1.10	110	44
6 0	37	22*	.28			185	.81		3½	1.10	110	44
6 6	37	20*	.31			160	.81		3⅝	1.15	115	46
7 0	38	20*	.43			135	.82		3⅝	1.15	115	46
7 6	38	18*	.42			120	.83		3⅝	1.15	115	46
8 0	39	18*	.57			105	.84		3¾	1.20	115	48
8 6	39	18*	.73			95	.85		3¾	1.20	115	48

*These spans and gauge combinations will permit of a man working on top of green concrete slabs if he uses reasonable care without causing a deflection that will become permanent. The criterion for this is that, under semicontinuous beam conditions, a deflection of more than 2% of the span length may represent a stress in the core sheet that is beyond the yield point.

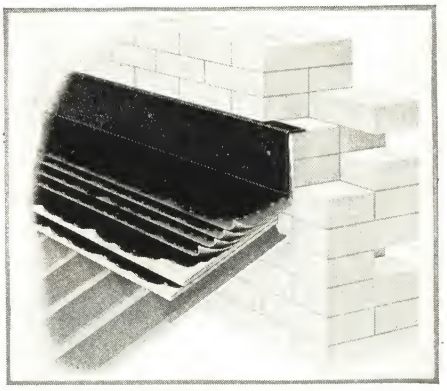
ROBERTSON PROTECTED METAL FLASHINGS

A large percentage of the troubles with built-up roofs occur in connection with the flashings against parapet walls, chimneys, ducts and around the head of downspouts. A complete system of special Robertson Protected Metal flashings has been developed to provide watertight fittings at every possible source of trouble. Some of these flashings are illustrated in these pages. The special value of each type of flashing is pointed out in the captions under them. There are also special flashings for use in joining Robertson V-Beam Roofing Sheets to corrugated walls. Illustrations and descriptions of these flashings will be sent on request.



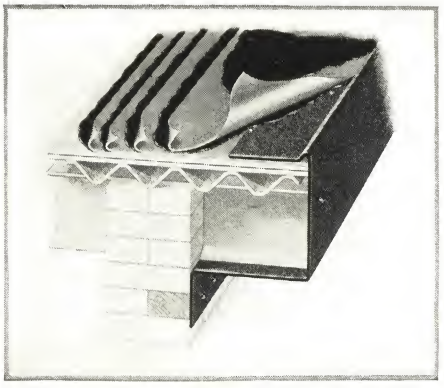
RPM Standard Stepped Counterflashing

Designed for use against brick parapet walls, gable walls, fire walls, etc. Note how it fits in between the bricks. It is fastened with nails and fiber cement. Illustration shows how the layers of built-up material are mopped up against the brick wall before the flashings are applied



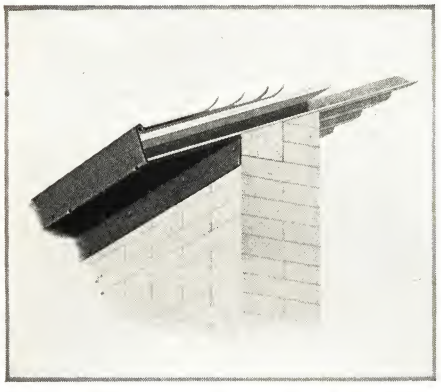
RPM Standard Counterflashing

For use where V-Beam Roof Decks meet a brick wall at right angles. The flashing is fitted in between the bricks. As in the case of the stepped counterflashing, the felt layers of the built-up roof are mopped up against the brick wall before the counterflashing is applied



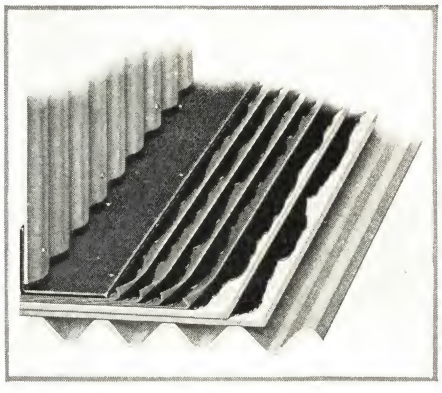
RPM Standard Gable Flashing

The flashing is bolted through the waterproofing and insulation to the V-Beam Roof Sheets. To fasten the flashing to the brick wall, wood blocks (placed by the masonry contractor) are inserted in place of bricks at certain intervals, and the gable flashings are attached by nails to the wood blocks



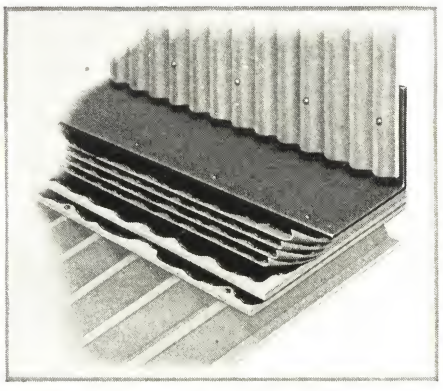
RPM Standard Eaves Flashing

This flashing is bolted to the V-Beam Sheets in the high parts of the corrugations. The lower part of the flashing is nailed to the wood "nailer" (placed in the brick by the masonry contractor). The top layer of felt is mopped over the eaves flashing



RPM Standard Sidewall Flashing

Used to make a watertight union where an adjoining corrugated sidewall parallels the corrugations of the V-Beam Roofing Sheets; as, for example, in cases where the roof meets the wall of a higher adjoining building



RPM Standard End Wall Flashing

Used when a corrugated sidewall meets the Robertson V-Beam Roof at right angles to the corrugations; as, for example, at the upper edge of a lean-to, or at the base of a monitor

SHEETS AND FLASHING READY FOR ERECTION

Robertson V-Beam Sheets are completely engineered before shipment. They are cut to fit and ready for immediate erection.

Little or no cutting on the job is necessary. Wastage of material is avoided and delays in erection are eliminated.

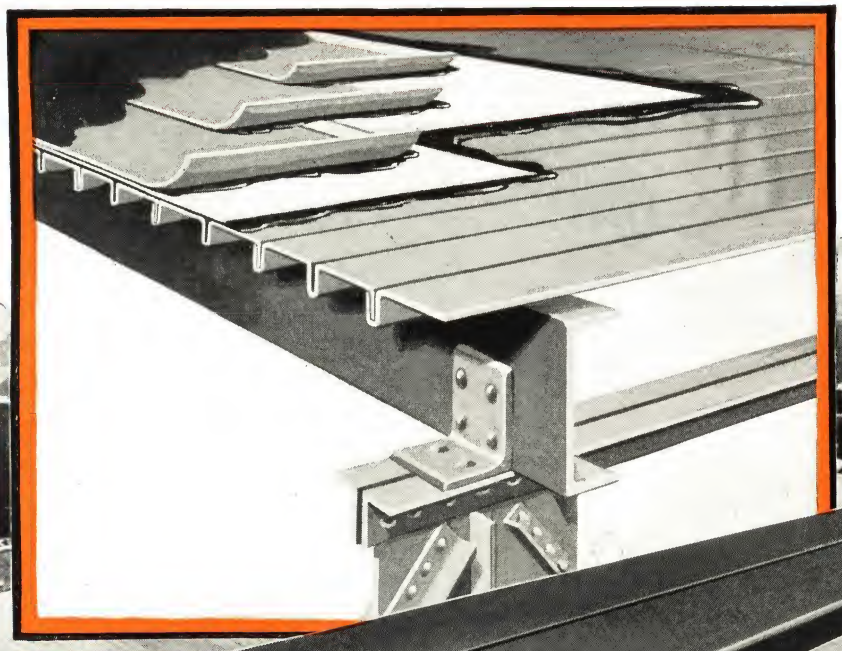
ESTIMATES AND PROPOSALS FURNISHED

Robertson engineers will be glad to go over your blueprints and advise you what savings in your structural sheet can be made through the use of Robertson V-Beam Sheets.

They will prepare for you a revised layout of roof purlins for the new arrangement. Recommendations will be made as to the length and gauge of V-Beam Sheeting that will meet the load-carrying requirements and complete specifications and cost estimates will be submitted.

MAHON

STEEL ROOF DECK



THE R. C. MAHON COMPANY

DETROIT, MICHIGAN

THE R. C. MAHON COMPANY

Manufacturers of the Mahon Steel Roof Deck

DETROIT, MICH.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Product

MAHON STEEL ROOF DECK.

For Mahon Permanent Steel Floor Forms, Kalamein and Tin Clad Doors, Rolling Steel Doors and Cast Iron Roof Sumps, see Manufacturers' Index.

Mahon Steel Roof Deck for Every Type of Roof

The Mahon Steel Roof Deck, details of which are set forth in these pages, offers a roof suited to practically any type of building calling for either flat, pitched or arched roof construction. Mahon Deck Plates can be furnished curved to fit arched roofs—minimum radius 36 ft.

Architects and engineers will find that the Mahon Steel Roof Deck greatly simplifies roof design, and builders will appreciate the ease with which the roof can be applied. It has advantages in structural simplicity which permit rapid erection and consequently lower the cost of construction.

The laying of a Mahon Steel Roof Deck is one of the simplest operations that you have ever witnessed.

Installing Mahon Steel Roof Deck on the Latrobe Electric Steel Co. Plant, Latrobe, Pa.

The work, due to the ingenious design of parts, can proceed swiftly and is done entirely from the upper side of the roof. Every plate of a Mahon Steel Roof Deck interlocks with the preceding unit. There are no end fittings—the ends being lapped one over the other. All lap joints occur directly over purlins. All clips are installed from the top as the plates are put in place.

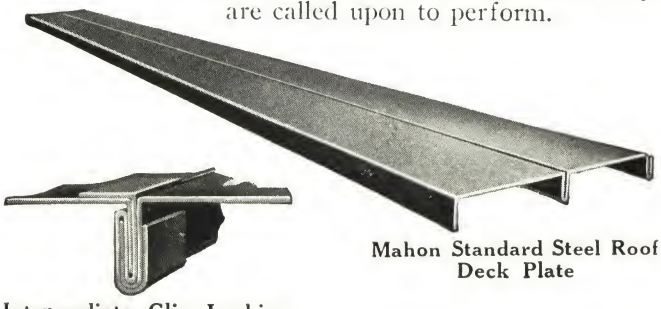
The Mahon Steel Roof Deck consists of one standard roof plate and three standard clips by which the plates are fastened together and to the supporting framework.

Material

Mahon Steel Roof Deck is furnished in 18 and 20-gauge, in special, tight-coated galvanized copper bearing steel and requires no painting or maintenance whatsoever. It can also be furnished in copper bearing steel painted if desired. Mahon has established 20-gauge as a minimum for roof deck plates as a result of exhaustive tests which indicate this as the lightest material that can be safely and economically utilized. Weight impacts would be likely to seriously affect roofs of lighter gauge.

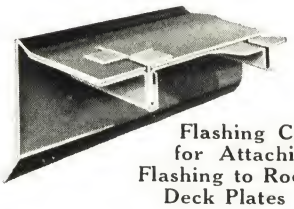
Standard Assembling Clips

The laying of a Mahon Steel Roof Deck requires only the installation of the steel clips by which the plates are fastened together as they are assembled, and by which they are fastened to the supporting structural steel. Mahon clips have been designed primarily for simplicity, and they have in every instance a strength more than adequate for the work they are called upon to perform.

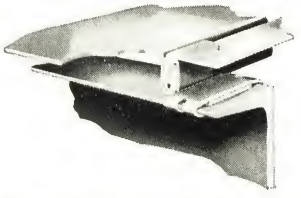


Mahon Standard Steel Roof Deck Plate

Intermediate Clip Locking Roof Deck Plates Together Midway Between Purlins

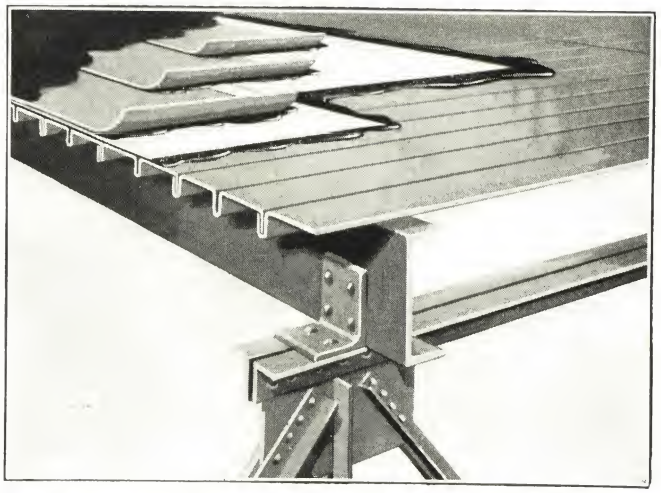


Flashing Clip for Attaching Flashing to Roof Deck Plates



Beam or Purlin Clip for Attaching Roof Deck Plates to Beam or Channel Purlins

There is not in the design of the Mahon Steel Roof Deck any part which can work up, become loose or in any way act to rupture the insulation or roofing material.



Cross Section of Mahon Steel Roof Deck Showing Application of Insulation and Waterproofing

An Integral Unit Roof

Mahon Steel Roof Deck when installed functions as a single steel plate, the separate units becoming an integral part of one interlocking whole when assembled. A feature of the Mahon Steel Roof Deck which makes for extra rigidity and strength is the location of all end lap joints directly over purlins. The minimum end lap is 2 in. No unsightly laps or joints are visible from the underside of the Mahon Deck.

All plates in the Mahon Deck lay 12 in. wide when installed, ribs 1½ in. deep are 6 in. on centers. Every second rib where the plates interlock provides three thicknesses of metal. Each deck plate is locked with special clips to the adjoining plate at intervals of approximately 2 ft. between purlins to prevent deflection of individual plates due to localized loading. This feature eliminates the possibility of loosening the bond between insulation or roofing material applied to the deck.

Universal Application

The unusual lightness of the Mahon Steel Roof Deck fits it for use on buildings of every type, including buildings with unusually long spans, such as auditoriums, gymnasiums, and the like. Designers will also find this type of roof deck admirably suited to factories,

Mahon Steel Roof Deck Installed on the Hupmobile Plant, Detroit, Mich.
Note the deck-formed saddles adjacent to the parapet wall

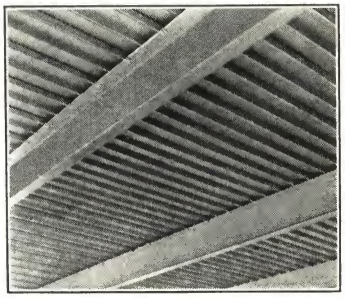
office buildings, hotels, apartments, hospitals, and schools.

The fact that a Mahon Steel Roof Deck can be insulated to exactly the degree required for the type of occupancy makes it an ideal construction for any type of building.

Expansion and Contraction

Expansion and contraction difficulties have been entirely obviated in the design of the Mahon Steel Roof Deck. Note in the center rib an ample allowance for lateral expansion and contraction, and also that longitudinal expansion and contraction of the plate is provided for in the lap joints.

These factors mean that bulging positively cannot occur in a Mahon Steel Roof Deck, and that no injury to insulation or composition roofing can occur through expansion or contraction.



Underside of Mahon Steel Roof Deck
Note the clean, even appearance and the absence of end joints

Monitor Flashings

The projecting ribs on the plates of the Mahon Steel Roof Deck can be cut and the sheet turned up to make flashings under monitor windows, curbs, etc.

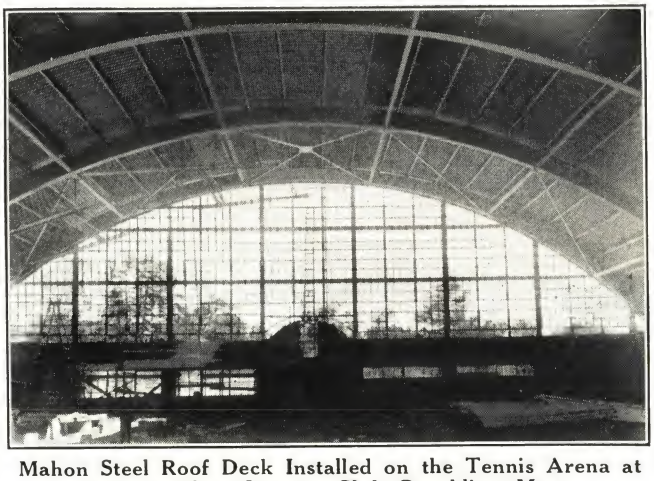
Saddles

On many types of buildings, where Mahon Steel Roof Deck is employed, built-up saddles are unnecessary. Saddles may be created by warping the roof deck (as illustrated in detail No. 17, page 11.) This is accomplished by setting the purlins in the drainage section at the desired angle to produce ridges and valleys—usually an angle of ¼ in. to the foot is sufficient. No extra roof deck plates are required and it does not involve cutting or fitting. Saddles for either sloping or vertical face sawtooth buildings may be economically built from Mahon Steel Roof Deck plates cut to fit (as illustrated in details Nos. 18, 19, 20, page 12). This system of roof drainage has worked out very successfully on a number of installations where it was adaptable. To meet conditions where the aforementioned methods are not practical, saddles may be built from any material of a permanent nature—in which case we recommend the application first of a layer of asphalt or tarred felt on the steel deck proper, the same to be cemented to the deck with asphalt or pitch. This should be mopped on top with asphalt or pitch, over which the saddle fill may be installed.

Caution—We do not recommend cinders for saddle fill. However, if cinders are to be used, under no consideration should this material be laid next to the steel deck. The sulphuric content of cinders is detrimental to steel, and for the protection of the deck we would recommend that at least two plies of roofing felt be laid with pitch or asphalt over areas of the deck to be covered with cinders.

Insulation

The Mahon Steel Roof Deck is a complete structural unit, and requires no insulation for stiffness or rigidity—these factors being amply provided for in the deck itself. In the case of unheated structures, such as loading docks, warehouses and the like, insulation is not necessary. In buildings that must be heated or where condensation is a problem we recommend the use of insulation of any approved type—amount of insulation will be governed by the type of occupancy.



Mahon Steel Roof Deck Installed on the Tennis Arena at the Brookline Country Club, Brookline, Mass.

Composition Roofing

Any standard composition roofing can be used over the Mahon Steel Roof Deck. Asphalt roofing may be preferable from a standpoint of weight. Sheets should

be mopped solid similar to roof construction over concrete.

Fire Safety

No matter what type of occupancy a building is designed for, building codes in centers of population demand fire safety. Mahon Steel Roof Deck provides the utmost in fire safe roof construction, and will obtain for the owner a low insurance rate.

Specification for Mahon Steel Roof Deck

(A) **Work Included—**

All roof surfaces shown on plans as steel deck.

(B) **General—**

Steel Deck shall be as manufactured by THE R. C. MAHON COMPANY, 8650 Mount Elliot Avenue, Detroit, Mich., or equivalent, meeting fully this manufacturer's standard of quality.

(C) **Materials—**

(C1) ***Deck Plates***—(C1a) Deck plates shall be of tight-coated, galvanized copper bearing steel.

(C1b) Deck plates shall not exceed 12 in. in width reinforced with webs or ribs not less than 1½ in. deep spaced not to exceed 6 in. on centers, so constructed as to allow for expansion and contraction.

(C1c) Minimum gauge of steel for plates shall be 20 gauge for spans up to and including 7 ft., and 18 gauge for spans over 7 ft. up to and including 8 ft.

(C1d) Deck plates shall be capable of withstanding a distributed live load of 40 lb. per sq. ft. without permanent deflection on the above maximum spans.

(C2) ***Attachment Clips***—Furnish steel clips adapted to permanent attachment of plate ribs to each roof purlin spaced 12 in. on centers. Furnish interlocking clips for securing adjoining deck plates together midway between purlins.

(D) ***Erection***—

All end laps of deck plates shall be made directly over roof purlins, with a minimum overlap of 2 in.

Deck plates shall be secured to each purlin every 12 in. on centers by steel clips fastened to the deck ribs.

Each deck plate shall be secured to the adjoining plates by interlocking clips set at intervals of approximately 2 ft. between purlins.

Note: These interlocking clips create lateral continuity and prevent one sheet from deflecting below the level of those adjoining.

Engineering Data

Light Weight—

As indicated before, the weight of Mahon Steel Roof Deck is such that it permits considerable economies in construction. The Mahon 20-gauge deck weighs 2.5 lb. per sq. ft. and the 18-gauge deck weighs 3.25 lb. per sq. ft. The total weight of roof will depend on the type and amount of insulation and the type of roofing material used.

300,000 Sq. Ft. of Mahon Steel Roof Deck Are Utilized in This Building

Millions of square feet are now in use on various types of buildings

Mahon Steel Roof Deck Installed at the Durant Motor Plant, Lansing, Mich.

Deflection—

Load tests for deflection carried out by the Perry Testing Laboratories, Detroit, Mich., on the Mahon Steel Roof Deck with live loads of 30 and 40 lb. per sq. ft. showed no permanent deflection in either 18 or 20 gauge deck.

Results of these tests are as follows:

DEFLECTION IN INCHES—18-GAUGE—NO INSULATION

Purlin spacing	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″
Live load, 30 lb. per sq.ft.	.083	.105	.156	.232	.325	.431	.554
Live load, 40 lb. per sq.ft.	.104	.134	.202	.354	.398	.573	.732

DEFLECTION IN INCHES—18-GAUGE—1-INCH INSULATION

Purlin spacing	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″
Live load, 30 lb. per sq.ft.	.061	.095	.125	.181	.235	.271	.354
Live load, 40 lb. per sq.ft.	.088	.129	.162	.237	.317	.392	.512

DEFLECTION IN INCHES—20-GAUGE—NO INSULATION

Purlin spacing	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	.....	.....
Live load, 30 lb. per sq.ft.	.098	.115	.167	.251	.338	.....	.....
Live load, 40 lb. per sq.ft.	.112	.144	.220	.320	.447	.....	.....

DEFLECTION IN INCHES—20-GAUGE—1-INCH INSULATION

Purlin spacing	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	.....	.....
Live load, 30 lb. per sq.ft.	.061	.088	.143	.213	.229	.....	.....
Live load, 40 lb. per sq.ft.	.079	.124	.192	.270	.338	.....	.....

Method used in making these tests is clearly illustrated in the diagram. All deflection readings were taken at "C" midway between purlins "A"-"B." Readings were taken at each rib and a mean deflection established.

Purlin "A" in the diagram is movable to test deflection at various purlin spacings.

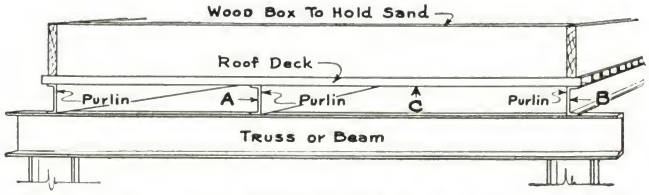


Diagram Illustrating Method of Testing Mahon Steel Roof Deck for Deflection

Standard Length Plates

Mahon Steel Roof Deck is rolled from special tight-coated, galvanized copper bearing steel sheets and can be furnished in either 18 or 20-gauge in any length up to 12 ft. 4 in.

Standard plates are carried in stock for immediate shipment in 20-gauge, in lengths of 6 ft. 2 in., 7 ft. 2 in., 8 ft. 4 in., 10 ft. 4 in., 11 ft. 6 in. and 12 ft. 4 in.

Standard 18-gauge plates are carried in stock in lengths of 8 ft. 2 in. only.

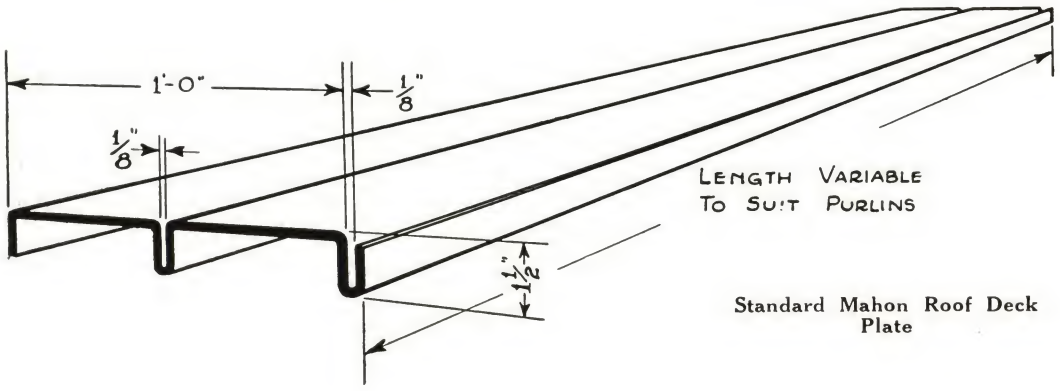
Purlin Spacing

The 20-gauge deck plates should not be used for purlin spacings exceeding 7 ft.

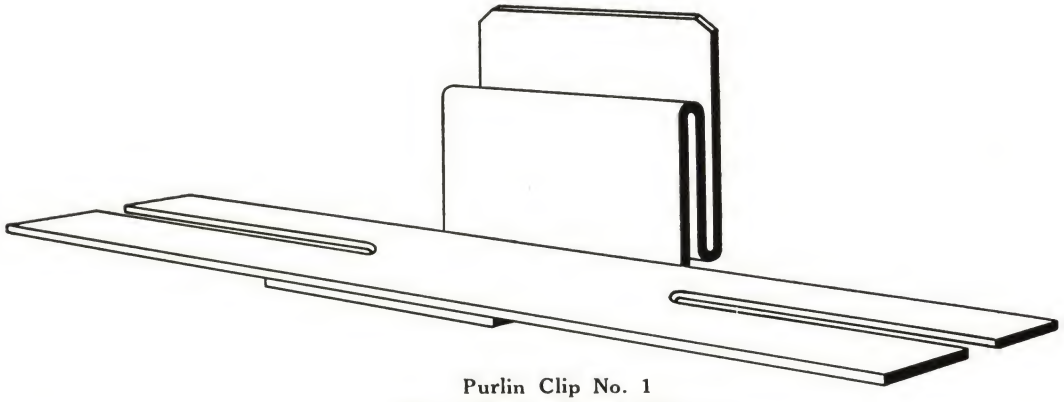
We recommend that the maximum purlin spacing for 18-gauge deck plates be limited to 8 ft.

STANDARD DECK PLATES RECOMMENDED FOR VARIOUS PURLIN SPACING

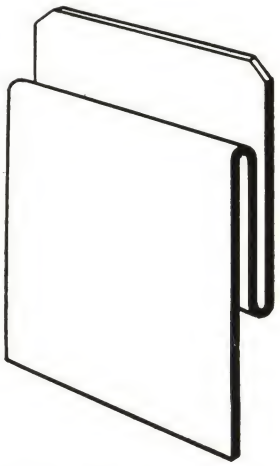
Purlin spacing	Plate lengths
to 4′-0″	8′-2″ or 12′-4″
4′-0″ to 5′-0″	5′-2″ or 10′-4″
5′-0″ to 6′-0″	6′-2″ or 11′-6″ or 12′-4″
6′-0″ to 7′-0″	7′-2″
7′-0″ to 8′-0″	8′-2″ or 8′-4″



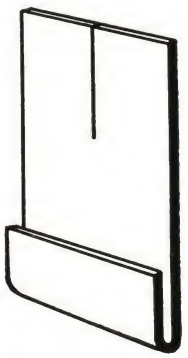
Standard Mahon Roof Deck Plate



Purlin Clip No. 1
For attaching roof neck plates to I-beam or channel purlins

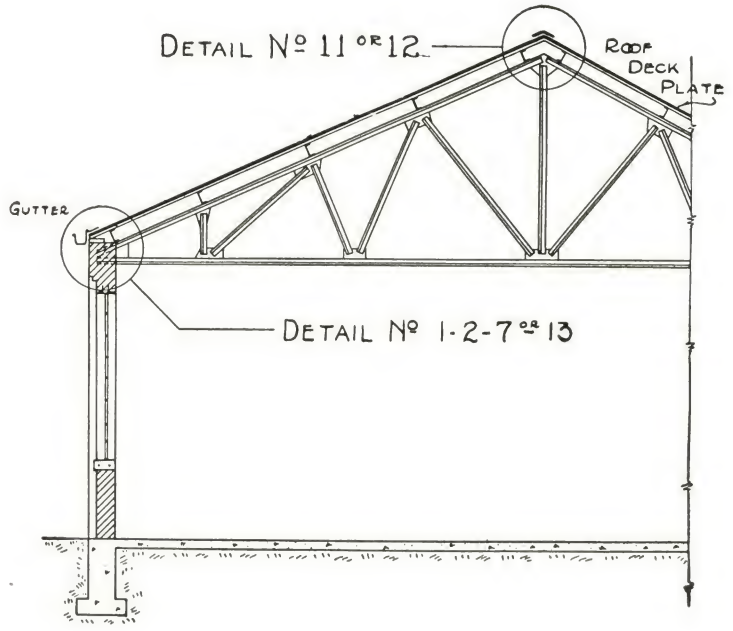


Intermediate Clip No. 2
For locking roof deck plates together midway between purlins

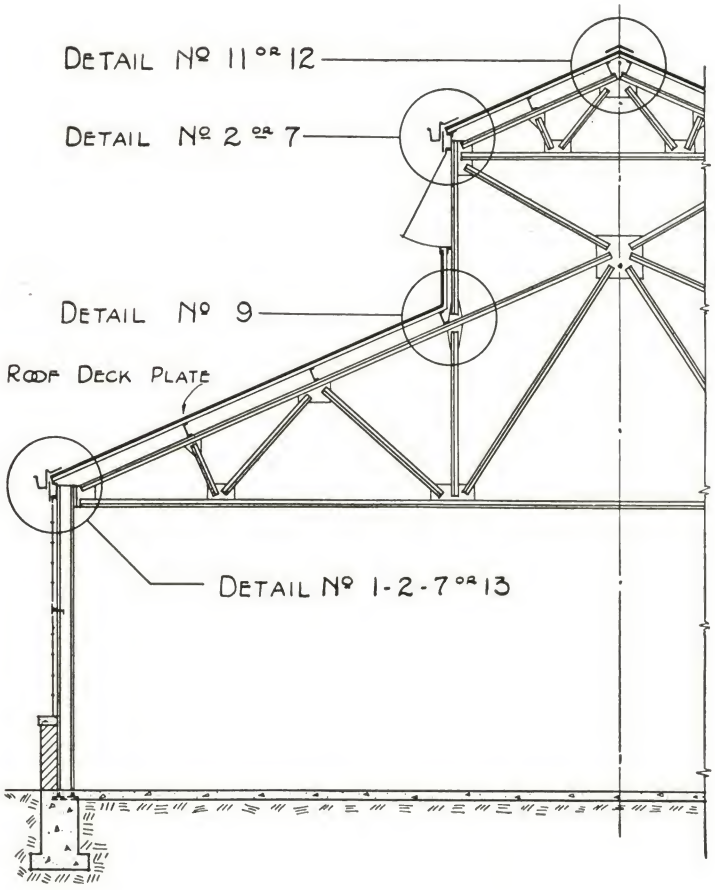


Flashing Clip No. 3
For attaching flashing to roof deck plates

MAHON STEEL ROOF DECK

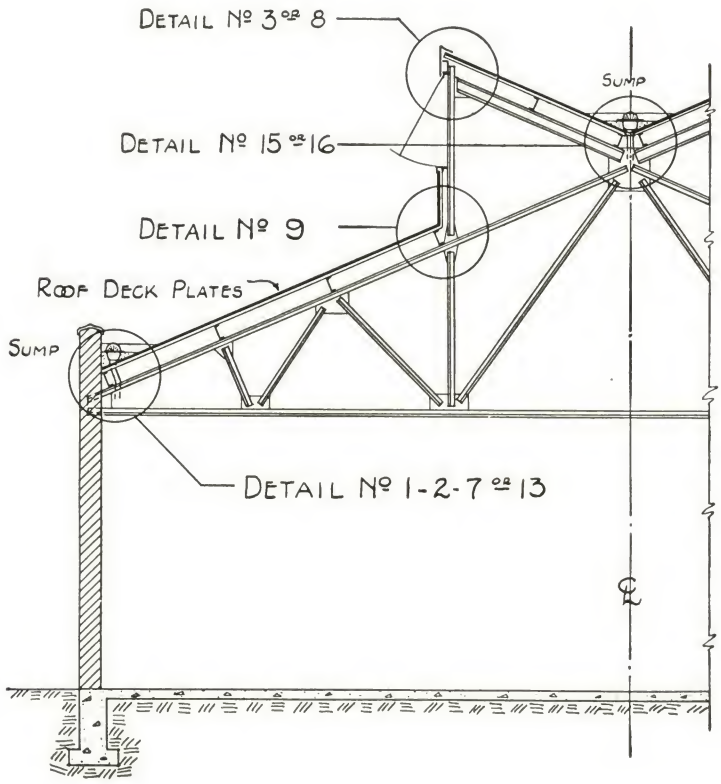


Application Pitched Roof

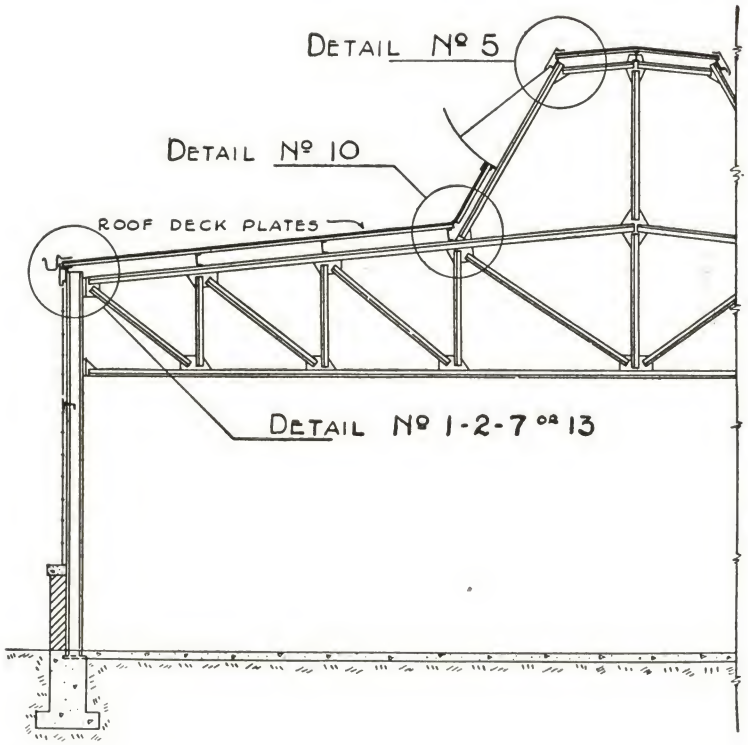


Application Pitched Roof—Monitor

MAHON STEEL ROOF DECK



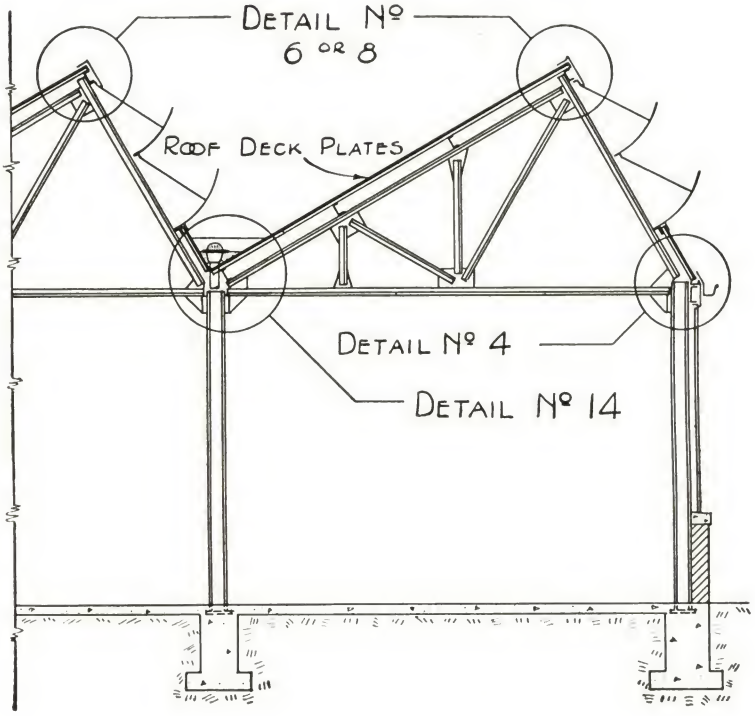
Application Pitched Roof—Valley Monitor

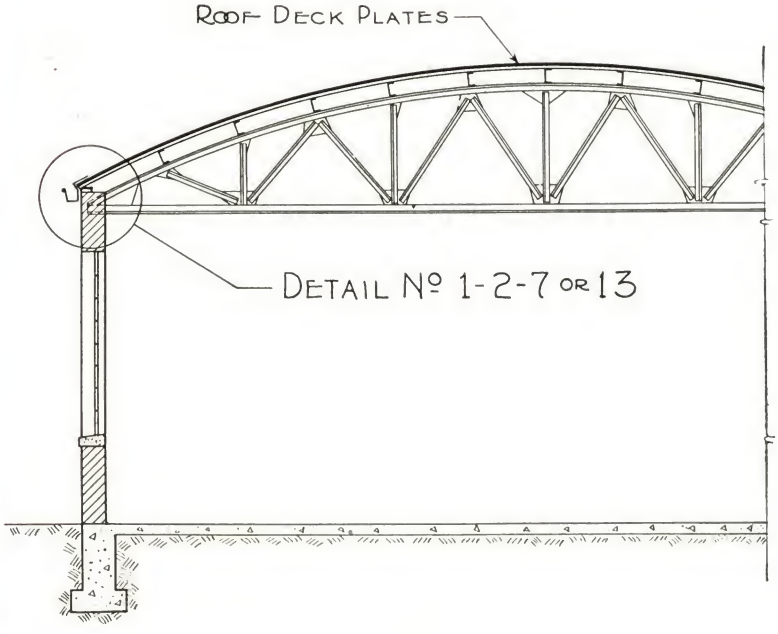


Application Flat Roof—"A" Frame

MAHON STEEL ROOF DECK

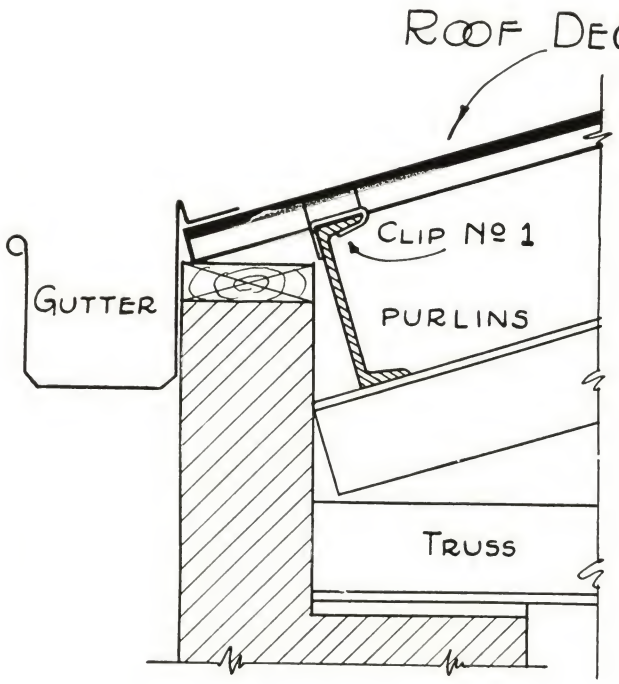
Application
Typical Sawtooth



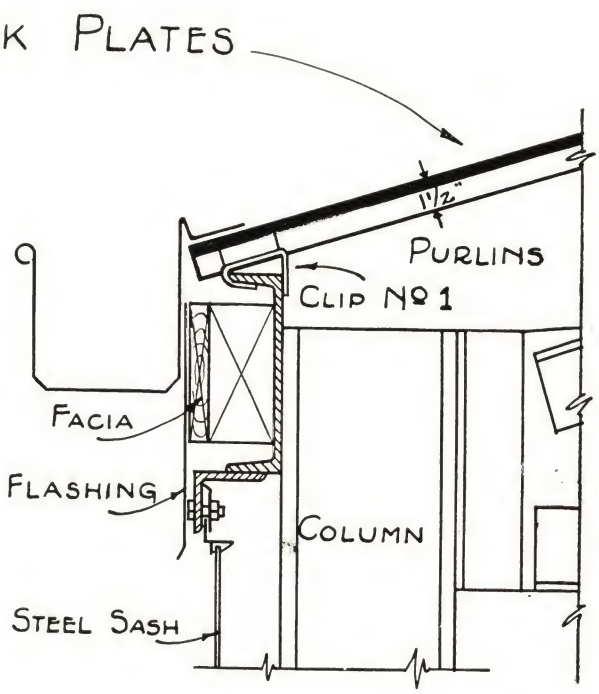


Application
Mahon Curved
Roof Deck Plates
on Bowstring
Truss Roof

MAHON STEEL ROOF DECK



DETAIL Nº 1



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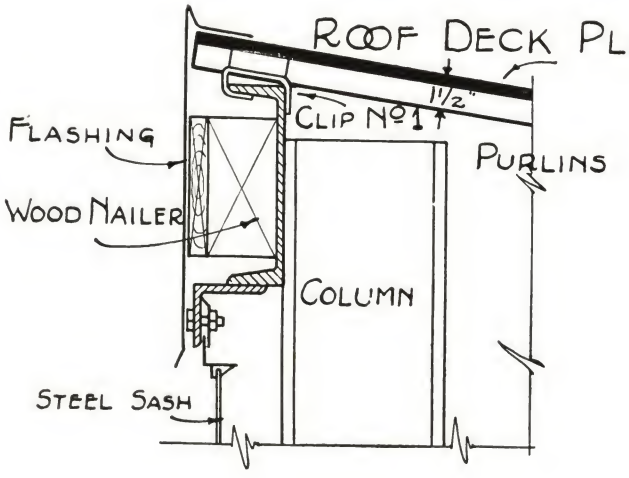

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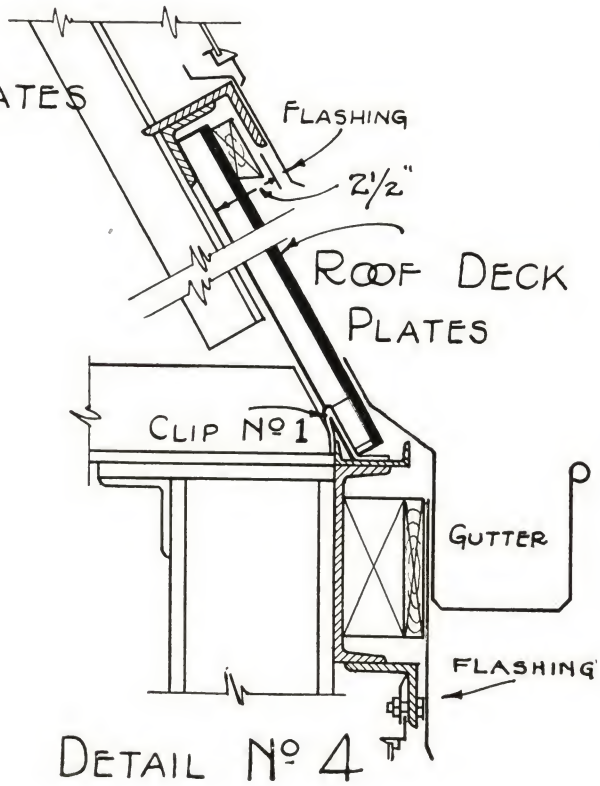
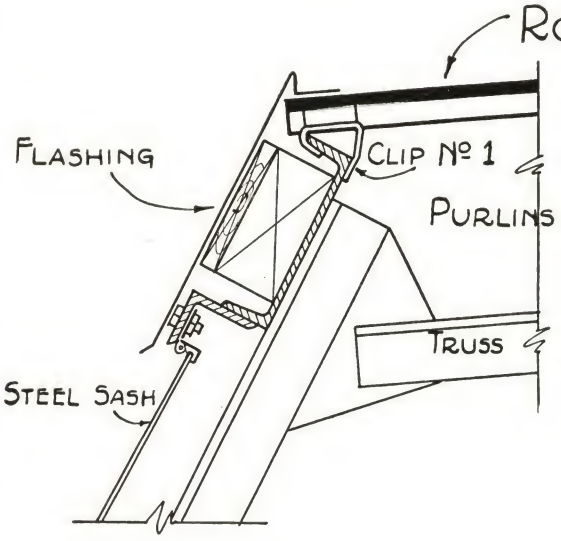


DETAIL Nº 4

MAHON STEEL ROOF DECK



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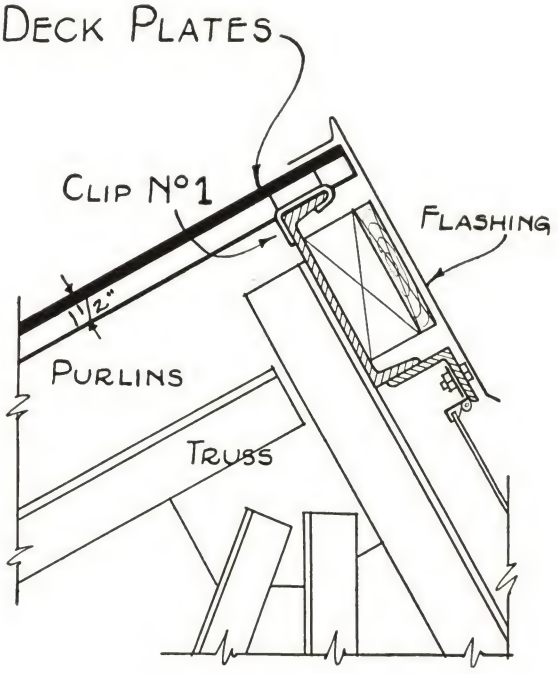

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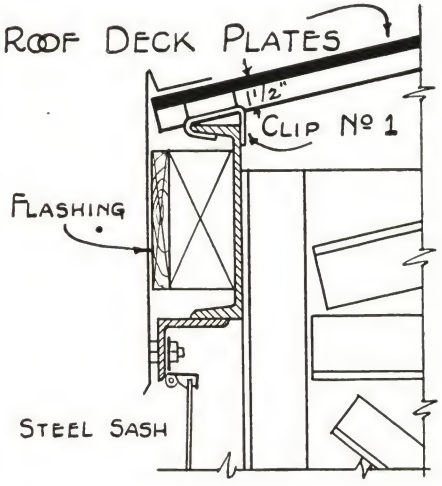

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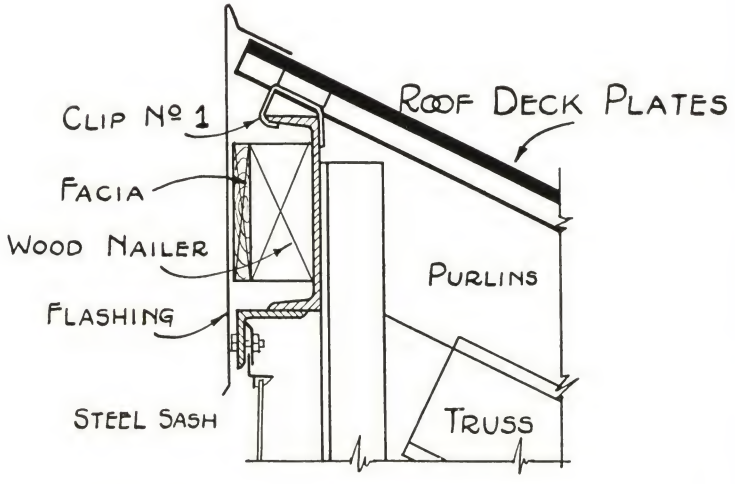
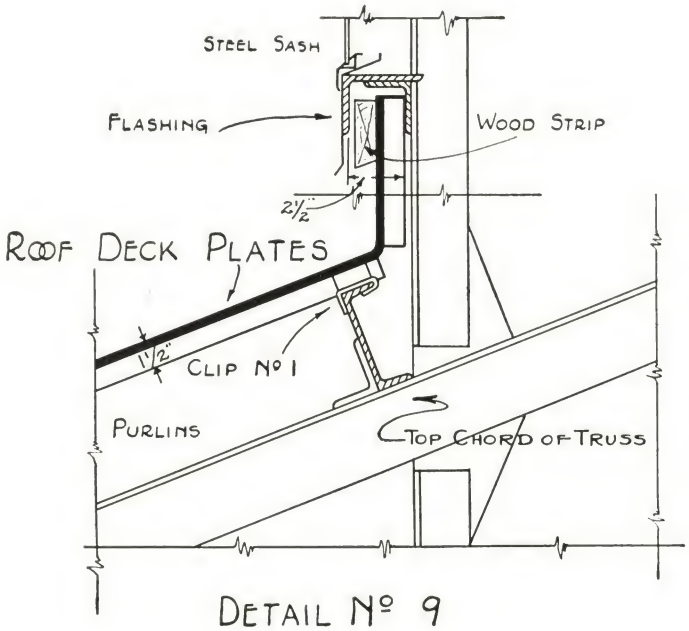
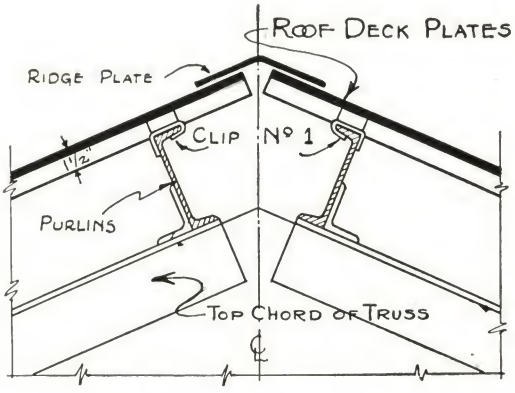


DETAIL Nº 8

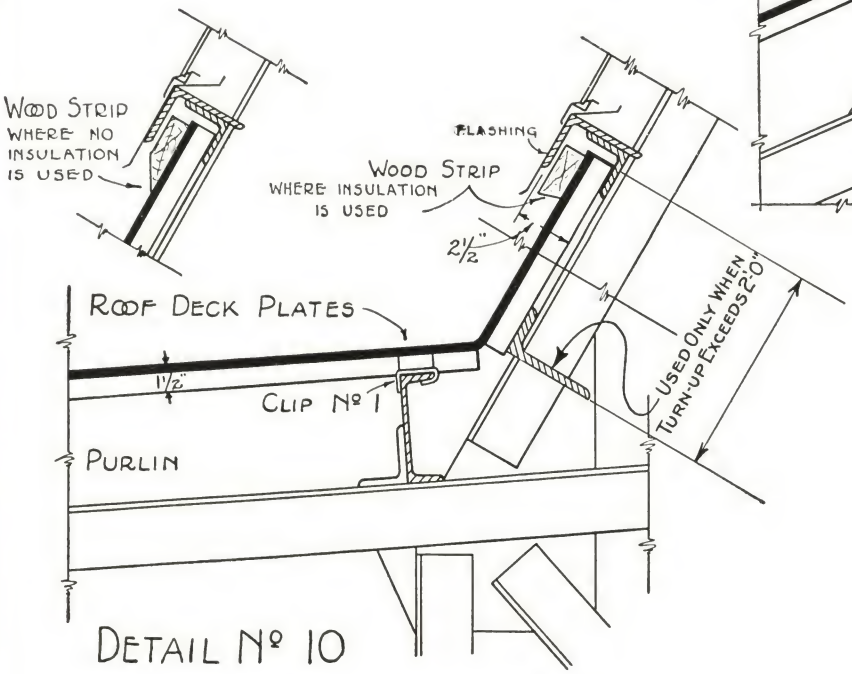
MAHON STEEL ROOF DECK



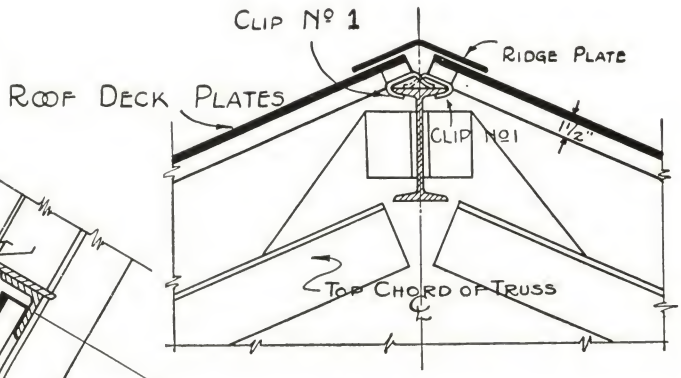
DETAIL Nº 9



DETAIL Nº 11

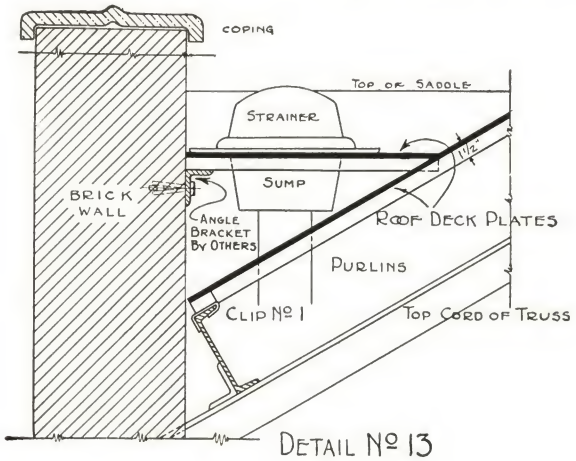


DETAIL Nº 10

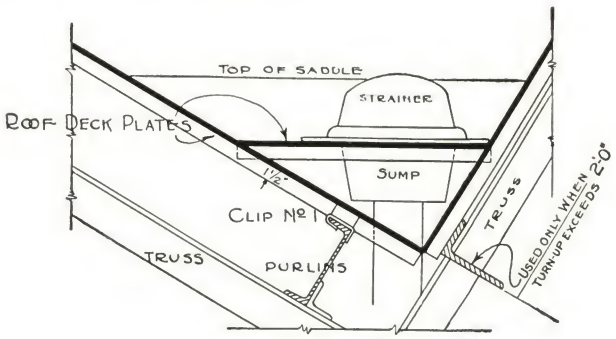


DETAIL Nº 12

MAHON STEEL ROOF DECK



DETAIL Nº 13



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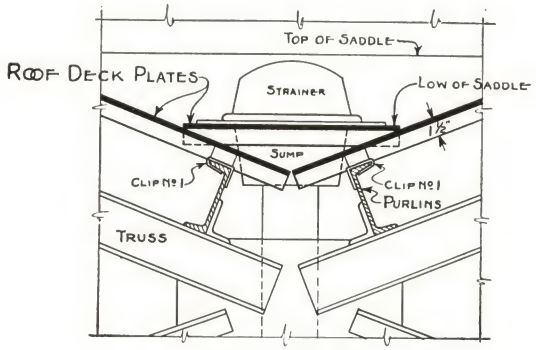

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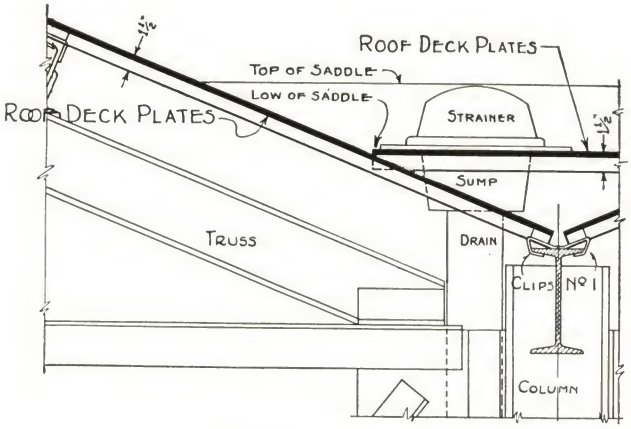
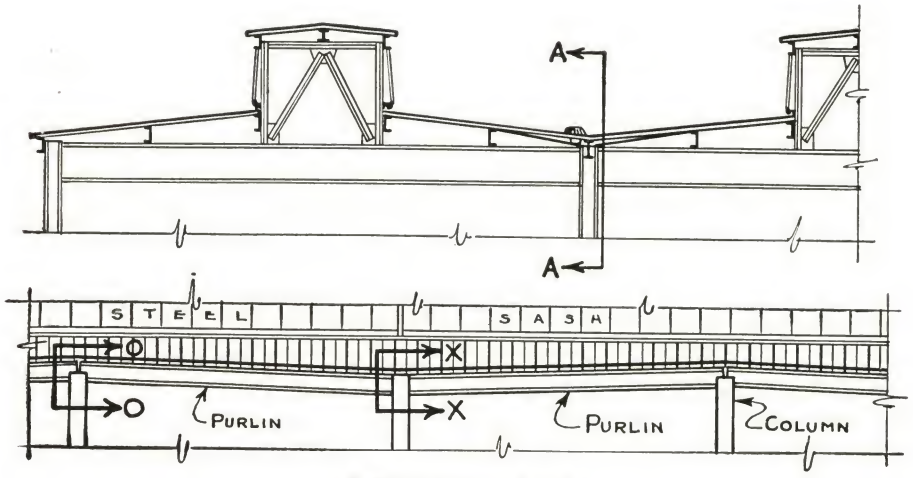
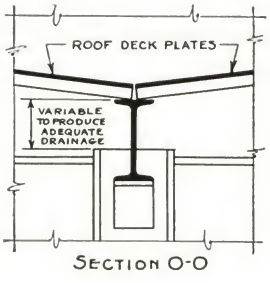


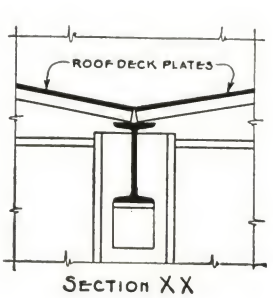
DETAIL Nº 16



SECTION A-A



SECTION O-O

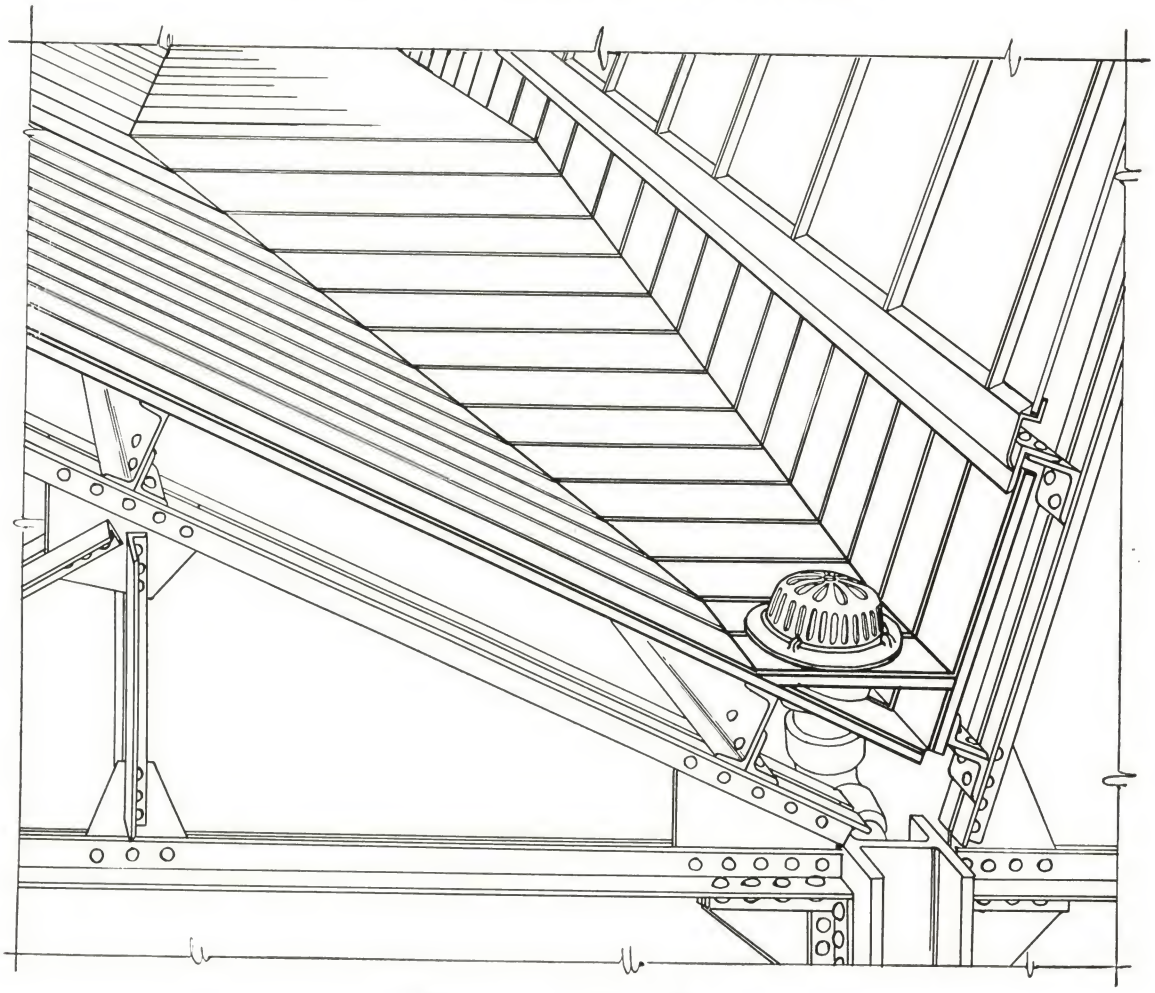


SECTION XX

DETAIL Nº 17

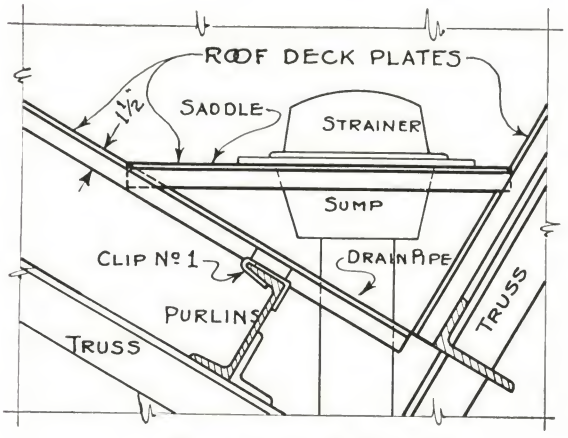
METHOD OF WARPING MAHON STEEL ROOF DECK TO FORM DRAINAGE VALLEYS

MAHON STEEL ROOF DECK



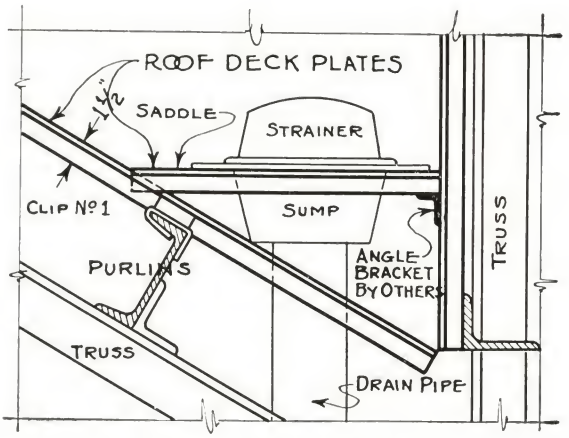
DETAIL Nº 18

METHOD OF BUILDING SADDLES IN SAW TOOTH CONSTRUCTION WITH MAHON STEEL ROOF DECK PLATES CUT TO FIT



DETAIL Nº 19

WHERE BOTH FACES OF SAW TOOTH SLOPE INSTALL AS ABOVE

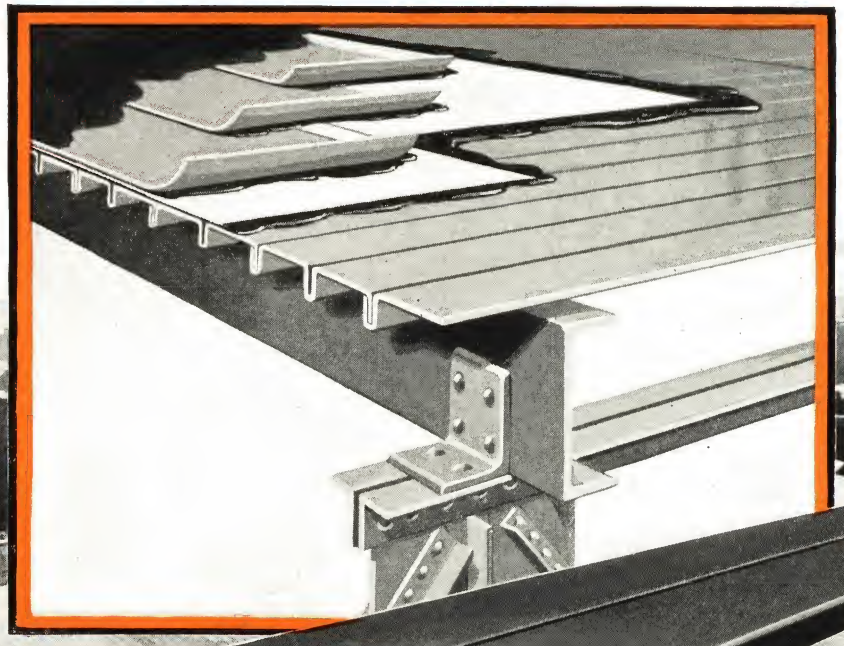


DETAIL Nº 20

FOR SAW TOOTH WITH VERTICAL FACE ANGLE BRACKET IS USED

MAHON

STEEL ROOF DECK



THE R. C. MAHON COMPANY

DETROIT, MICHIGAN

TRUSCON STEEL COMPANY

Manufacturers of a Complete Line of Steel Building Products

YOUNGSTOWN, OHIO

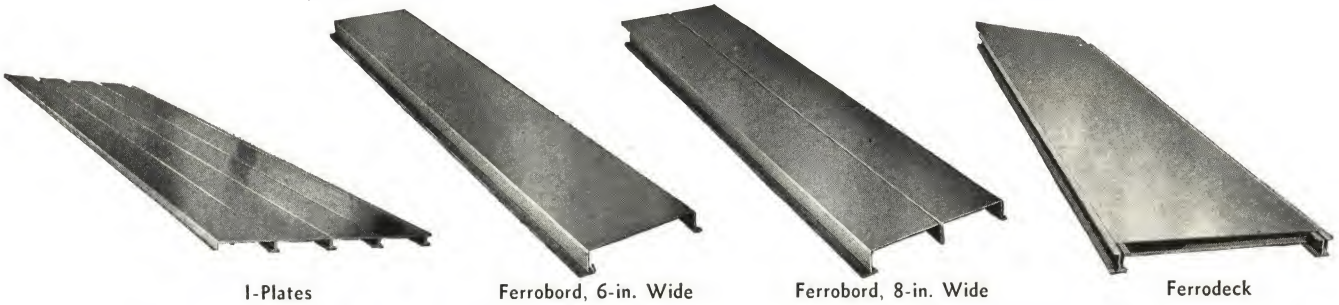
Warehouses and Offices in All Principal Cities—For List, see Our Pages on Steel Windows

Products

STEELDECK ROOFS (Insulated and Waterproofed):
Truscon I-Plates.
Truscon Ferrodeck.
Truscon Ferrobord.

TRUSCON STEELDECK ROOFS

For Buildings, Channelplate and Teegrid Floor Systems, Steel Doors, Steel Windows, Steel Joist, Safety-Tread Steel and Reinforcing, see page numbers in Manufacturers' Index.



I-Plates | Ferrobord, 6-in. Wide | Ferrobord, 8-in. Wide | Ferrodeck

Roof Security and Roof Economy

For any spacing of purlins, for a new building or replacing an old roof, for any building condition, Truscon furnishes a type of fireproof roof deck of ample strength at minimum cost. A Truscon Steeldeck—Ferrobord, I-Plates or Ferrodeck—developed from extensive experience—provides a lightweight, fireproof, insulated roof deck which not only is economical in cost but effects saving in supporting structural work.

Truscon Steeldecks

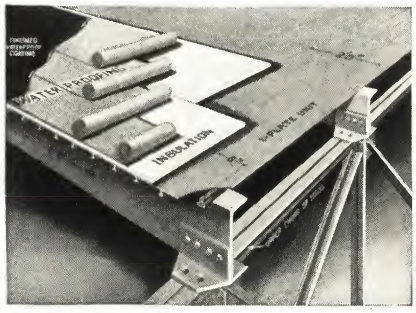
Provide a smooth, solid surface which is ideal for the application of any standard roofing material. Their use eliminates any possible damage to the built-up roofing due to expansion and contraction. They cannot warp or shrink and there are no bulges or waves, protrusions, holes or open spaces to interfere with the proper construction of built-up roofing or cause breaks as the workmen walk over it.

Truscon I-Plates Roof Construction

The "I-Plate" Type of Truscon Steeldeck is so formed that each sheet is a unit itself, capable of carrying loads between the members of the roof structure.

The "I-Plates" are manufactured of 18-gauge and 20-gauge steel sheets with "I-Sections" formed in the sheets longitudinally. On one outside edge a complete "I-Section" is formed; on the other a flange of about ½ in. is formed to fit down between the webs of the adjacent "I-Sections," giving a smooth finished surface.

I-Plates are applied directly over roof purlins and are spliced together by means of sleeve splice clips that telescope over the ends of the "I-Sections" and wrap around the top flange of the purlins.

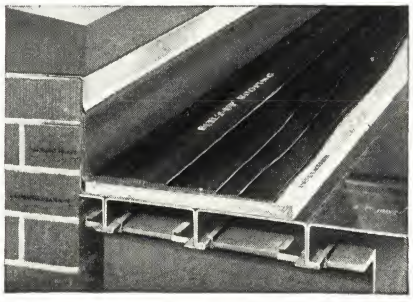


Truscon Ferrobord Roof Construction

The Ferrobord Type of Truscon Steeldeck is so formed that each sheet firmly interlocks with the adjoining sheets to form a continuous deck over the entire roof.

Two types are available. The 8-in. Ferrobord is made in 24, 22 and 20-gauge copper-bearing steel in lengths up to 12 ft., and used where spans do not exceed 5 ft. 6 in. A reinforced rib is formed down the center of the sheet. The 6-in. Ferrobord is made in 20 and 18-gauge steel in any desired length and may be used for spans up to 10 ft.

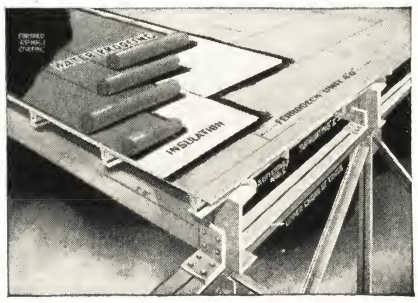
An interlocking rib is formed on the outer edge of each sheet, forming supporting members across the deck, when interlocked with the outside rib of the adjoining sheet and fastened to the structural roof members by clips.



Truscon Ferrodeck Roof Construction

The Ferrodeck Type of Steeldeck is an assembly of subpurlins and reinforced roof sheets. The subpurlins with their "U" shaped tops are formed by welding specially bent 18-gauge channel sections back to back. The Ferrodeck roof sheets, either 18 or 20 gauge, are fabricated with two edges flanged over about 1 in. at 90 degrees.

To erect Ferrodeck, the subpurlins, at 2-ft. centers, are fastened to the roof framing with spring clips. The roof sheets are then placed over the subpurlins so that the flanged-over edges of adjacent sheets fit side by side into the openings along the tops of the subpurlins. The reinforcing members on the bottom sides of the sheets are utilized to anchor the sheets to the subpurlins.



THE CANTON FOUNDRY & MACHINE CO.

Manufacturers of Building Specialties

CANTON, OHIO

NEW YORK OFFICE: Carnegie Hall, 154 West 57th Street—Telephone CIrcle 7-2994

PRODUCTS

BUILDING SPECIALTIES, which include:

Sidewalk Doors; Coalhole Covers; Sidewalk Ventilators; Area Gratings; Illuminating Iron Sidewalk Plates; Sidewalk Gutter Boxes; Conductor Connections; Conductor Boots; Ash Pit Doors; Stack Doors; Coal Chutes (Foundation); Coal Doors; Wheel Guards; Valve Covers; Drain Covers; Water Meter Covers; Lamphole Covers; Catchbasin Covers; Manhole Covers; Street Drain Boxes; Street Castings.

For our page on Automobile Turntables, see Manufacturers' Index.

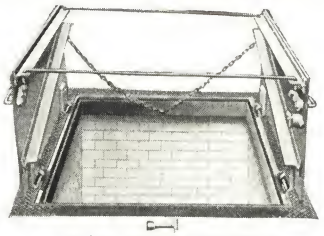
WATERPROOF SIDEWALK DOORS

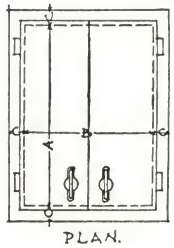
CLEAR OPENING SIZES
All dimensions in inches

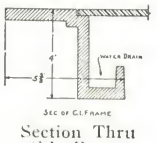
A	B	A	B	A	B
Double Leaf					
30	42	48	36	60	60
30	48	48	48	66	36
36	36	54	48	66	48
36	48	57	57	72	36
40	48	60	36	72	48
44	44	60	48	72	60
Single Leaf					
20	18	24	24	30	30
24	18	30	24	36	30

Construction

Our doors are constructed with a heavy cast iron frame cast in one piece, which will last indefinitely, because cast iron has a very great resistance to corrosion. Frame has a large water drain cast entirely around the inside and is provided with a drain through the center where the doors meet. The leaves are ¼-in. checkered steel plate reinforced with angles and provided with heavy removable cast iron hinges having bronze hinge pins.




PLAN.


Section Thru C.I. Frame

Specifications

Double Leaf Doors—Furnish and install, flush type, double steel leaf Sidewalk Doors, of the clear opening size as shown on the plans, and as manufactured by THE CANTON FOUNDRY & MACHINE CO., Canton, Ohio.

Doors to be constructed with a heavy cast iron frame, cast in one piece, with a 1¼x1-in. water drain, cast around the inside of frame, this drain to be provided with two ¾-in. pipe taps for attaching pipe drains to sewer or sump.

Checkered steel door leaves to be ¼ in. thick, reinforced with 3x2x¼-in. angles, and provided with a 2x$\frac{3}{16}$-in. channel drain through center where doors meet.

Door leaves to be provided with heavy removable cast iron hinges with bronze hinge pins.

Doors to lock and unlock from inside only, by means of sliding bolt type lock, and provided with stay rod and chains to hold the same in open position.

Single Leaf Doors—Furnish and install, flush type, Single Steel Leaf Sidewalk Doors of the clear opening size as shown on the plans and as manufactured by THE CANTON FOUNDRY & MACHINE CO., Canton, Ohio.

Doors to be constructed with a heavy cast iron frame, cast in one piece, with a 1¼x1-in. water drain around the inside of frame, this drain to be provided with two ¾-in. pipe taps for attaching pipe drains to sewer or sump.

Checkered steel door leaf to be ¼ in. thick, provided with heavy removable cast iron hinges with bronze hinge pins and sectors for holding door open, and locking same when closed.

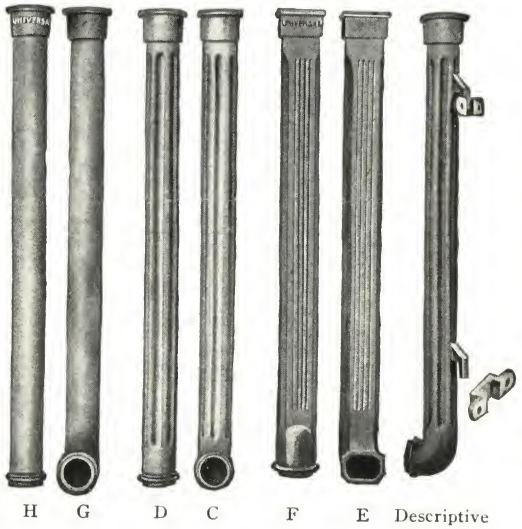
UNIVERSAL CAST IRON LEADER BOOTS

Advantages of Cast Iron Boots

The use of cast iron boots eliminates any possible chance of having an unsightly, rusted out down-spout. They cannot become broken or displaced, and when installed have a very neat appearance and are an added attraction to the finished building.

Construction and Finish

"Universal" Leader Boots and Connections are constructed of cast iron, the thickness of the metal in them being heavier than ordinarily furnished. The castings are sand-blasted and all fins are carefully removed. They are easily installed, being provided with lugs for attaching them to wall brackets. They are designed to correspond with plain round, round corrugated and square corrugated copper or galvanized iron conductor pipe.


H G D C F E Descriptive

SIZES

Style	Size, in.	Style	Size, in.
C, D, H, G	3	F, E	2¾ x 3½
	4		3¼ x 4½
	5		4¼ x 5½
	6		5¼ x 6½

Standard stock sizes are 4 ft. 6 in. over all. Can furnish any length desired, also special sizes. Styles H, D and F are used in connection with underground soil pipe or tile drains. Styles G, C and E discharge water on sidewalk or driveway.

Specifications

Furnish and install for all down-spout connections "Universal" Cast Iron Leader Boots or Connections manufactured by THE CANTON FOUNDRY & MACHINE CO., Canton, Ohio, of the style, size and length as shown on the plans. Same to be provided with lugs and 1½-in. wall brackets for attaching to building.

AMERICAN BAR LOCK CO., INC.

Manufacturers of Bar Lock Sidewalk Lights

36-30 Thirty-eighth Street

LONG ISLAND CITY, N. Y.

BRANCH OFFICES OR REPRESENTATIVES IN ALL LARGE CITIES

For Alglas Skylight and Roof Light Construction, see Manufacturers' Index

Products

BAR LOCK SIDEWALK LIGHTS, SIDEWALK VENTILATING SLABS, SIDEWALK DOORS of all descriptions.

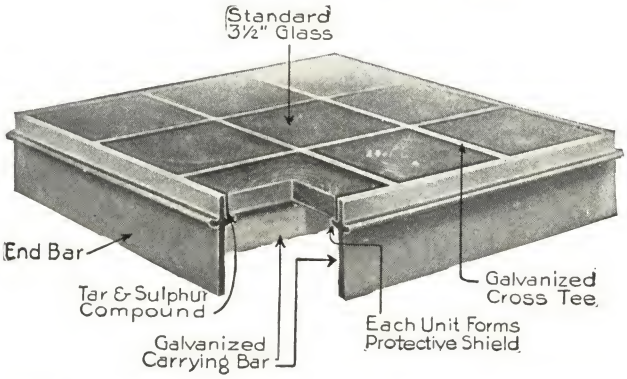
For pages describing Bar Lock Skylights, see Manufacturers' Index.

BAR LOCK SIDEWALK LIGHTS

Bar Lock sidewalk light construction is a system which is exclusive with the AMERICAN BAR LOCK CO., INC. It has many advantages of construction some of which are the following:

(1.) Much larger proportion of net glass area, thus allowing a corresponding increase in the total amount of light penetrating the panel. The glass area of a panel of Bar Lock Sidewalk Lights is over 80% of its area.

(2.) Greatly decreased weight. A Bar Lock Sidewalk Light panel weighs approximately only one-half the weight of a reinforced concrete panel of equal size. This greatly decreases the dead loads to be supported by structural members with a corresponding reduction in their weight and cost. The considerably lower weight also means greatly decreased cost in freight.



Construction of Bar Lock Sidewalk Lights

The Bar Lock sidewalk light panel is built up with ribs of heavy specially rolled steel shapes welded together at all outside corners and lockjointed together at all other intersections. The ribs form a protective shield around each light of glass, which allows easy replacement of glass which may be damaged through accident or abuse.

Galvanizing Insures Durability—After the panel has been completely fabricated in our shop, it is properly cleaned and is dipped in hot zinc spelter which gives it a thick galvanized coating ample in thickness to withstand dampness and all ordinary abuse for years.

Tested Fresnel Glass Lights—The AMERICAN BAR LOCK CO., INC., uses only polariscope tested lights of glass which assure freedom from internal stress, the cause of most cracking and chipping. Lights are 3½ ins. square and ¾ in. thick. Glass with ribs on the upper exposed surfaces is provided in alternate lights for the purpose of *insuring* slipproof walking surfaces.

Bar Lock Glazing Compound—The spaces between the steel frame and the glass lights are filled with the Bar Lock Glazing Compound, which is a special mixture of tar and sulphur forming a durable elastic waterproof and weatherproof cushion around each light of glass.

Erection

Ordinarily Bar Lock sidewalk light slabs are crated and shipped to the building site to be set in place by the general contractor. Where desired, however, we shall be glad to furnish and install them complete by our own mechanics.

Cost

Bar Lock sidewalk lights compete in price with other forms of construction. We will be glad to quote prices on the receipt of plans and specifications or of a list of the sizes of panels required.

Specifications for Bar Lock Sidewalk Lights

Sidewalk Lights shown on plan shall be Bar Lock factory finished type as manufactured by the AMERICAN BAR LOCK COMPANY, INC. They shall be furnished ready to set under the manufacturers' direction.

Glass shall be 3½ ins. square, ¾ in. thick pressed, polariscope tested, Fresnel lens, to conform with United States Government Standard Simplified Practice Recommendation.

Glasses are to be spaced on 3 15/16-inch centers to give minimum of 80% glass area. Alternate glasses shall have raised non-slip ribs on their tread surfaces.

Galvanized frames shall be constructed so that they form a protective shield around each glass. The space between the shield and the glass to be glazed with tar and sulphur compound to form an elastic watertight, weatherproof expansion cushion.

Reinforced Concrete Sidewalk Lights

The older type of Bar Lock Crushproof Shield protected reinforced concrete sidewalk lights will be furnished if desired.

BAR LOCK SIDEWALK DOORS

Bar Lock sidewalk doors are of special design and construction. They must not be compared with doors as usually fabricated.

Bar Lock doors have a frame of structural shapes so arranged as to not only provide a structural frame of sufficient stiffness but a channel for drainage is also provided with a hole properly drilled and tapped for a connection to sewer. Doors are designed to carry a uniformly distributed load of not less than 300 lbs. per sq. ft. and are usually made of ¼ in. thick checkered plate. Doors may be arranged with glass inserts if desired. Sidewalk doors are provided with removable flush bronze hinges and door pull is of flush type.

The Bar Lock Flush Sidewalk Doors

These doors can be easily installed by any contractor. Prices, together with construction details, will be gladly furnished on request.

AMERICAN 3 WAY-LUXFER PRISM CO.

Daylight Engineers

1301-1305 South 55th Court
CICERO, ILL.
(Suburb of Chicago)

55 West 42nd Street
NEW YORK, N. Y.

For our Skylights, Transoms and Ventilators, see Manufacturers' Index

3-Way Armored Sidewalk Lights (Glass Guaranteed for 5 Years)

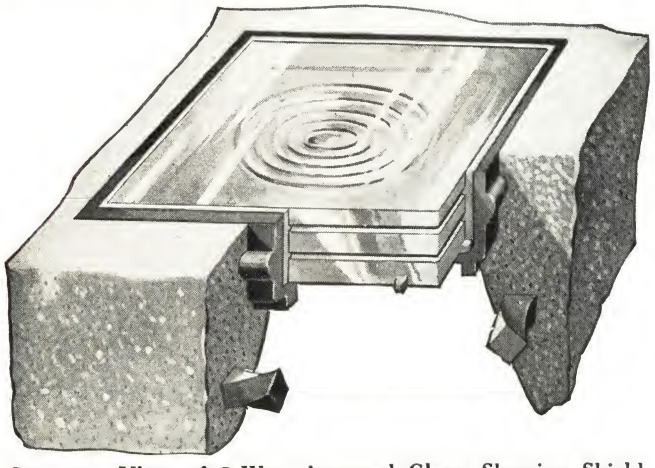
Daylight in basements and vaults is more important today than ever. Sunlight and daylight make for health and efficient operations.

3-Way Armored Sidewalk Lights accomplish this in more of a permanent way than any other light medium we know of.

Abundance of daylight. Lasting qualities in construction. And practically no maintenance cost.

Why

Concrete—Of special hard aggregate granite mixture—cured under ideal conditions—mixed and finished by skilled and trained mechanics.



Cut-away View of 3-Way Armored Glass, Showing Shield Embedded in Concrete

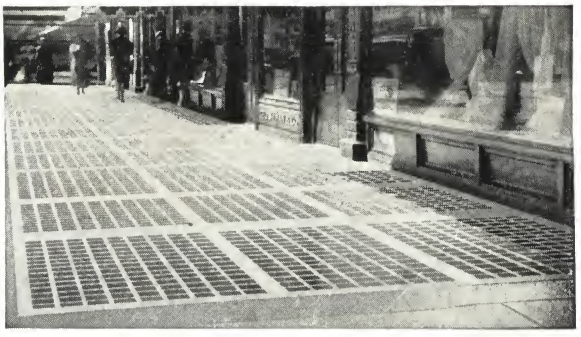
Glass—Is armored by a heavy cast iron shield. Hot galvanized treated. Glass is sealed under special heat treatment with pure tar and sulphur compound in this shield, thus overcoming the detriments to glass from expansion pressure.

Glass is Flintex-Lazalite quality free from internal stresses, each piece having passed polariscope test. Is made from special mixture for this purpose only.

Instant Replacement of Glass—Should it become necessary to replace a glass unit, replacement can be made in a moment's time by any help about the building. No special skill required. This means sidewalk lights can be kept in perpetual good condition at practically no maintenance cost.

5-year glass guarantee.

Watertight—Compounds which we use for waterproofing are prepared specially for this purpose and are of the highest grade and quality for additional insurance against any leakage.



3-Way Armored Sidewalk Lights

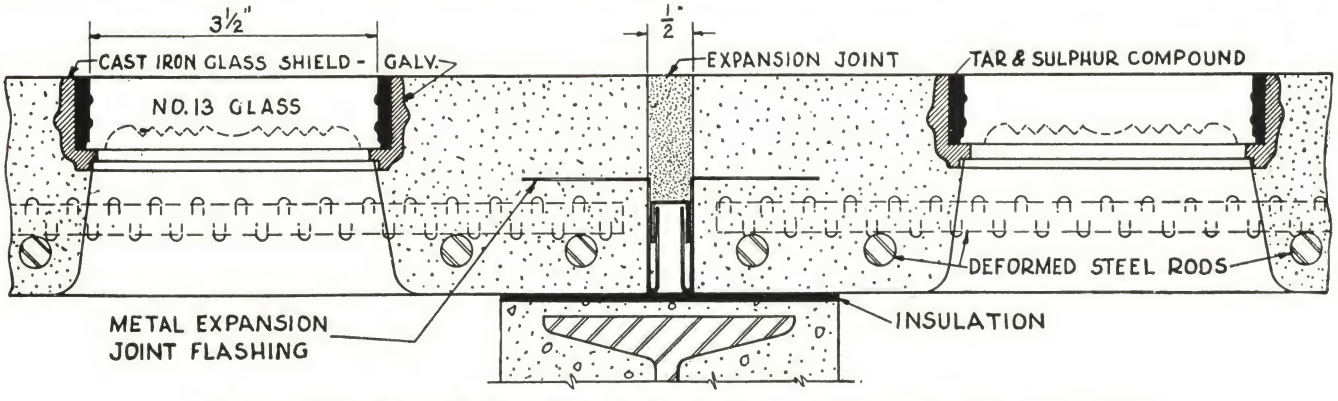
Specifications—Sidewalk Lights as shown on plans shall be of 3-Way Armored Glass Construction, Flintex-Lazalite Glass units sealed in galvanized cast iron shields, embedded in reinforced concrete construction.

Glass shall be No. 13A (3½-in. square Fresnel lens in 4-in. galvanized cast iron shields spaced 5-in. centers), or No. 12 (2¾-in. round sunburst lens in 3-in. galvanized cast iron shields spaced 4¼-in. centers). Glass for replacement to be supplied free of charge f.o.b. factory for period of 5 years.

(Can be furnished in factory finished slabs) or (Installed complete by manufacturer).

Sidewalk Doors

3-Way Type "C" Watertight Sidewalk Door. Channel frame, tapped for drain connection, heavy bronze hinges, flush top, quality door. Hand lift or equipped for elevator lift.



Section 3-Way Armored Glass Sidewalk Lights Showing Waterproof Intermediate Joint

NATIONAL VAULT LIGHT CO.

Concrete Sidewalk and Floor Lights and Natural Daylight Roofing

OFFICE AND WORKS
537 Jackson Avenue
(BRONX) NEW YORK, N. Y.

Products

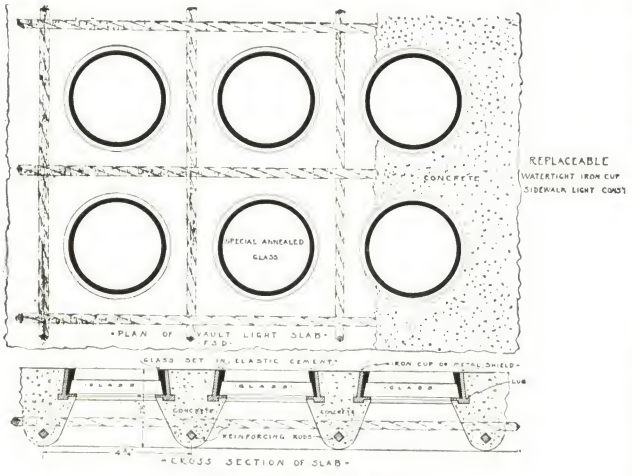
CONCRETE SIDEWALK LIGHTS.
CONCRETE FLOOR LIGHTS.
NATURAL DAYLIGHT ROOFING.
VAULT LIGHT DOORS.

Ready to set slabs, using any type of glass made in factory, and shipped where required.

These products are waterproof, rustproof, fireproof and burglarproof, there being no metal exposed.

No. 14 and No. 50 Sidewalk Light Construction

Our concrete glass construction is a standard manufacture. No. 14 consists of a 3-in. round glass and No. 50 of a 3½-in. square annealed glass both ⅞-in. thick. Both types are designed for heavy duty, being set in a specially constructed shield which is galvanized by a hot dipping process. Glasses are set with tar and sulphur composition to prevent them from cracking during expansion and contraction. Reinforced with twisted steel bars laid longitudinally and transversely. Replacements can be made without employment of a skilled mechanic. Expansion joints are formed where necessary and properly calked. Approximate weight 22 lbs. per sq. ft.



No. 14 Sidewalk Light

No. 75 Natural Daylight Roofing

Standard manufacture, consisting of wire glass 8¼ in. square and ½ in. thick, is set in a specially constructed shield galvanized by a hot dipping process. Glasses are set with tar and sulphur composition to prevent them cracking during expansion and contraction. Reinforced with twisted steel bars laid longitudinally and transversely. Replacements can be made without employment of skilled mechanic. Expansion joints are formed where necessary and properly calked.

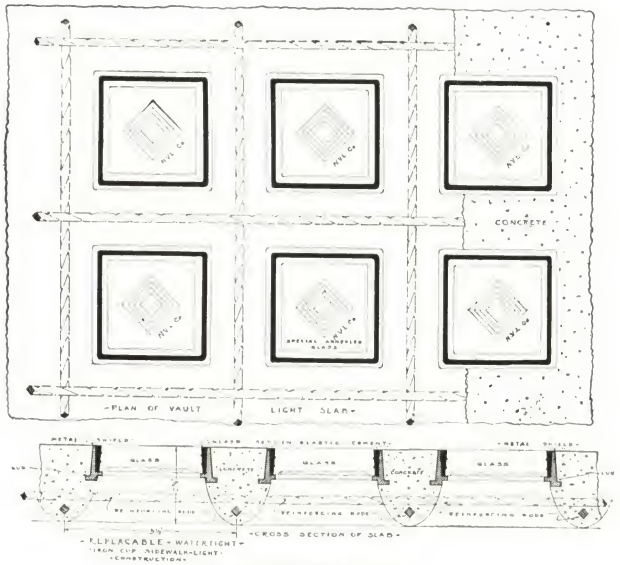
Approximate weight is 25 lbs. per sq. ft.

Guarantee

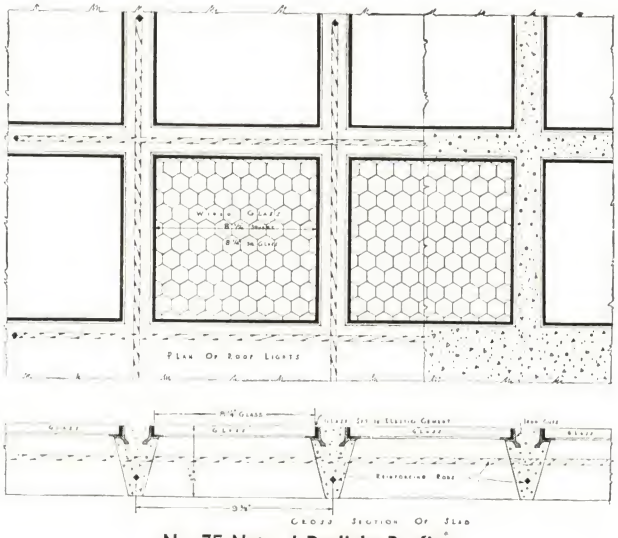
All our work is covered by a written guarantee to remain free from any defects of material or workmanship for a period of 1 year, and glass for replacements are furnished free of charge for period of 5 years f.o.b. our warehouse.

Installations

Installations have been made with our products on various projects, such as loft buildings, comfort stations, hospitals, subways, restaurants and apartment buildings.



No. 50 Sidewalk Light



No. 75 Natural Daylight Roofing

THE DONLEY BROTHERS CO.

13932 Miles Avenue
CLEVELAND, OHIO

Products

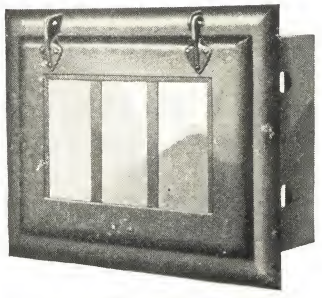
PACKAGE RECEIVERS, COAL CHUTES, ASH DUMPS, FIREPLACE DAMPERS, FIRE BASKETS, GARBAGE RECEIVERS.

Also Ash Pit Doors, Laundry Chute Doors, Dutch Oven Doors, Andirons, Mail Receivers and other Building Specialties.

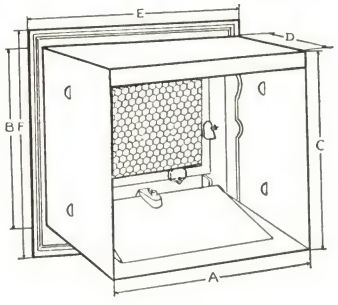
Donley Coal Chutes

Made in three types: Standard Wall Chute; Store Chute; and Grade Line Chute. All have copper steel bodies. Frames and hinges are of malleable iron or copper bearing steel. Latches, of malleable iron, lock automatically when door is closed, and all have a galvanized chain release to the lock. Doors are close fitting and substantial.

Donley Standard Wall Chute—Nos. 19, 48, 612, and 712 have copper steel frames; other numbers have malleable iron frames.



Donley Coal Chute, No. 48



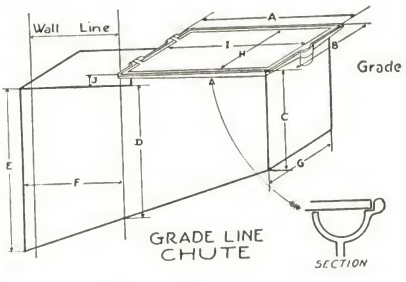
DIMENSIONS OF DONLEY STANDARD COAL CHUTE IN INCHES

Chute No.	A	B	C	D	E	F
19, 29, 39 and 48	22	16	16	9	25	19
213 and 313	22	16	18½	12	25	19
612 and 712	30½	21	24½	12	34½	24½
613 and 713	30½	21	23	12	34½	24½

Description	Wall opening, in.	Straight body for 9-in. wall	Slanted bottom body for 13-in. wall
Solid Steel Door	24 x 17	No. 19 & 29	No. 213*
Glass Door, 1 light	24 x 17	No. 39	No. 313*
Glass Door, 3 lights	24 x 17	No. 48	.....
Solid Steel Door	32 x 22	For 12" wall No. 612	No. 613*
Glass Door, 3 lights	32 x 22	No. 712	No. 713*

*Hopper optional. Hopper weights, small 11 lbs.; large 19 lbs.

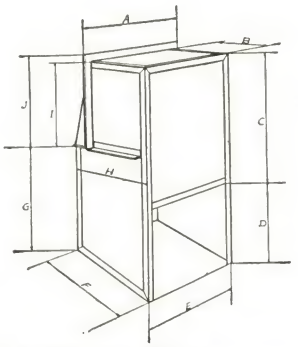
Donley Grade Line Chute—Donley Grade Line Coal Chute has horizontal opening for setting in sidewalk or lawn. The frame has a built-in gutter around the periphery for drainage to sewer. Frames and hinges are of malleable iron. Brass hinge pin. Checkered steel door and reinforced body.



DIMENSIONS OF DONLEY GRADE LINE COAL CHUTE IN INCHES

No.	A	B	C	D	E	F	G	H	I	J
1	21	26¼	14½	19½	24½	14¼	24½	25¼	20	2½
2	27	32¼	17¾	24¾	30½	16¼	30½	31¼	26	2½

Donley Store Chute—For use in stores where floor is approximately the same level as the sidewalk and when coal inlet is preferred in sidewall. Made of malleable iron and copper bearing steel. The lower part of door projects 3½ in. beyond the building line. No. 3 has solid door similar to No. 29. No. 4 has solid door similar to No. 612. Hopper is optional.

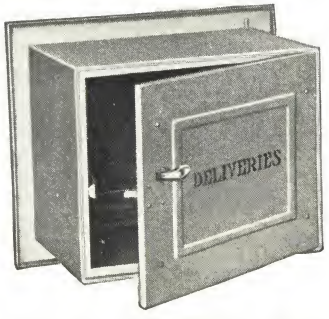


DIMENSIONS OF DONLEY STORE CHUTE IN INCHES

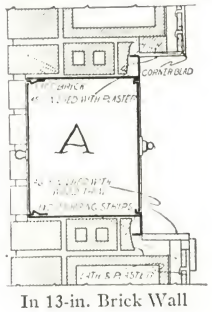
No.	A	B	C	D	E	F	G	H	I	J
3	25⅜	12	25	16	22⅞	16⅝	19	15½	16¼	17¾
4	34	12	30	16	31½	16⅝	19⅝	15½	20¾	22⅜

Donley Package Receiver

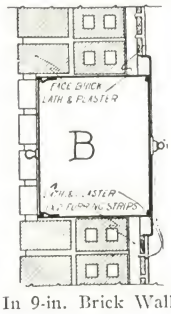
Consists of a steel box for building into outer wall of home. Insures safe and convenient delivery of milk, groceries, etc.



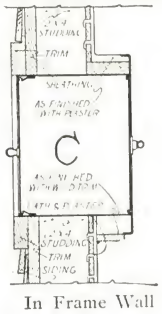
Built 13⅞ in. wide by 11⅛ in. high. Frame, 16¾x14 in. Nos. 1, 2 and 4 are 9 in. deep; No. 3 is 6 in. deep. Nos. 1 and 2 have an automatic locking and release device. No. 1 has inner door hinged on left; No. 2 has hinge on right. Nos. 3 and 4 are reversible. The doors have substantial, concealed hinges and catches with nickeled brass handles. Outer door is insulated; inner door has ventilating openings. Approved by Good Housekeeping Institute. Information on package receiver for apartment houses upon request.



In 13-in. Brick Wall



In 9-in. Brick Wall



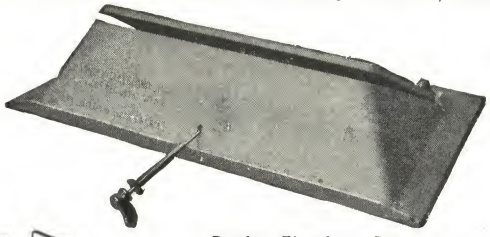
In Frame Wall

Donley (Underground) Garbage Receiver

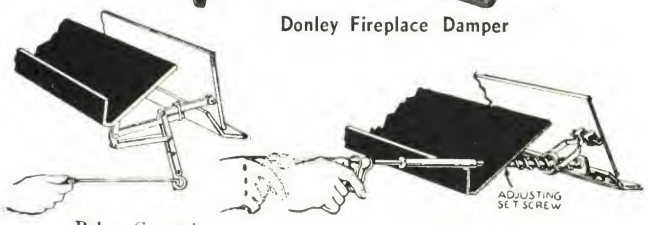
This inexpensive, sanitary garbage receptacle, buried in the ground near kitchen, ends garbage nuisances. It is inconspicuous, vermin-proof, fly-proof, and proof against stray dogs and cats. The close, tight fitting lid is opened by pressing foot lever and automatically closes when foot is removed. The top consists of two circular steel stampings hinged to each other and to the shell. The corrugated shell is extra thick and reinforced, bottom is open for water drainage. Inside pail is heavily corrugated and galvanized after fabrication. Finished in black with green top. Three sizes, 9, 12 and 15 gal.

Donley Fireplace Dampers

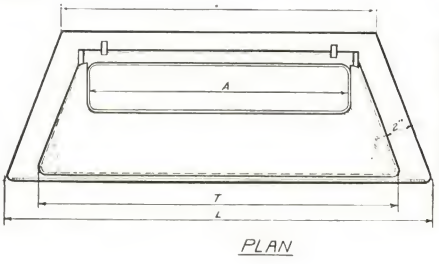
Donley Dampers are made of cast iron. They provide a smooth, properly formed metal throat. The valve plate for draft control is simple, substantial and easily regulated. Two types of control are available: Rotary Control, conveniently operated by knob through mantel front; and the Poker Control type, preferred by some for its inconspicuousness. The turned-up front flange makes damper self-supporting and permits installation in preferred position regardless of mantel material or shape of fireplace opening.

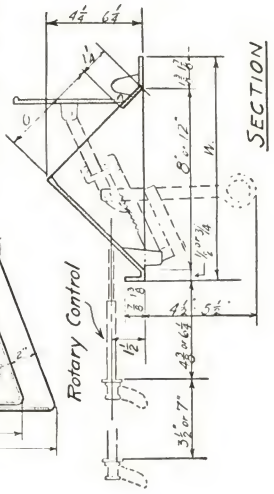


Donley Fireplace Damper



Poker Control Rotary Control



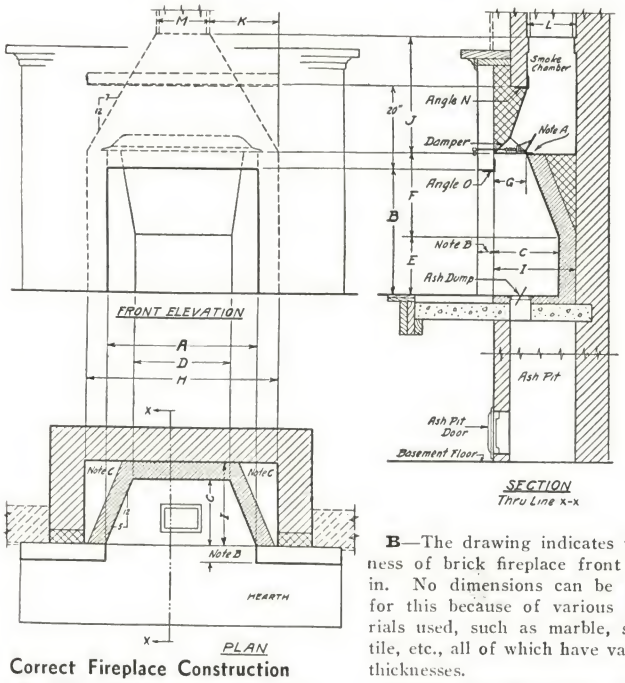


DIMENSIONS AND WEIGHTS OF DONLEY DAMPERS

Rotary control No.	Poker control No.	Throat, in. Bottom T	Throat, in. Top A	Throat, in. Opening O	Over all, in. Length L	Over all, in. Back B	Over all, in. Width W	Shipping weight, lb.
224	324	24	17 5/16	4 1/4	28 1/2	21	9 7/8	34
230	330	30	23 5/16	4 1/4	34 1/2	27	9 7/8	36
236	336	36	29 5/16	4 1/4	40 1/2	33	9 7/8	40
242	342	42	35 5/16	4 1/4	46 1/2	39	9 7/8	53
248	348	48	41 5/16	4 1/4	52 1/2	45	9 7/8	56
254	354	54	42 1/2	7	58 1/2	46	14 5/8	98
260	360	60	49 1/2	7	64 1/2	53	14 5/8	110
272	372	72	60 1/2	7	76 1/2	64	14 5/8	150
*284	*384	*84	73 1/2	7	88 1/2	77	14 5/8	165
*296	*396	*96	85 3/4	7	100 1/2	89	14 5/8	185

*Two valve plates.

Note: Where two dimensions are given in detail, the smaller applies to dampers 248-348 and under; the larger to dampers 254-354 and over. Both operating devices are indicated in order to show dimensions. See other illustrations for details of their operation.



Correct Fireplace Construction

A—The back flange of the damper must be protected from intense heat by being fully supported and shielded by the back wall masonry.

B—The drawing indicates thickness of brick fireplace front as 4 in. No dimensions can be given for this because of various materials used, such as marble, stone, tile, etc., all of which have varying thicknesses.

C—These hollow spaces should be filled to form solid backing. If desirable to include a furnace flue in either space, outside dimensions should be increased.

FIREPLACE DIMENSIONS AND EQUIPMENT

DIMENSIONS: Finished Fireplace Opening: Width	Height	Depth	Back	Vertical Back Wall	Sloped Back Wall	Throat	Rough Brickwork: width	depth	smoke chamber	Slope of smoke chamber	Std. Rectangular Flue Lining outside dimension	Std. Round Flue Lining inside diameter	EQUIPMENT: Accessories: Damper Rotary Control	Damper Poker Control	Ash Dump	Ash Pit Door	Angle N 4"x4"	Angle O 4"x4"	Furnishings: Fire Basket	Fire Screen	Andirons
A	B	C	D	E	F	G	H	I	J	K	L M	ϕ					Length	Length			
In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In. × In.	In.	No.	No.	No.	In. × In.	In.	In.	No.	No.	No.
24	28	16	11	14	18	8	37	20	24	14	8½ x 8½	10	324	224	58	10 x 12	36	30	—		
28	28	16	15	14	18	8	42	20	25	14½	8½ x 13	10	330	230	58	10 x 12	42	36	24		
30	30	16	17	14	20	8	42	20	25	14½	8½ x 13	12	330	230	58	10 x 12	42	36	28		
34	30	16	21	14	20	8	46	20	28	16½	8½ x 13	12	336	236	70	10 x 12	48	42	30		
36	30	16	23	14	20	8	46	20	28	16½	13 x 13	12	336	236	70	10 x 12	48	42	34		
40	30	16	27	14	20	8	50	20	32	18½	13 x 13	15	342	242	70	10 x 12	48	48	34		
42	30	16	29	14	20	8	54	20	35	20½	13 x 13	15	342	242	70	10 x 12	54	48	34		
48	33	18	33	14	23	8	59	22	40	23	13 x 13	15	348	248	70	10 x 12	60	54	40		
54	36	20	37	14	26	12	67	24	42	24½	13 x 18	18	354	254	70	12 x 15	66	60	40		
60	39	22	42	14	29	12	71	26	45	26½	18 x 18	18	360	260	70	12 x 15	66	66	—		
72	40	22	54	14	30	12	83	26	56	32½	18 x 18	18	372	272	70	12 x 15	80	80	—		

Donley Ash Dumps

These are trap doors installed in the floor of fireplace, offering convenient method of ash disposal.

Made with lids locked in place, in three sizes: No. 57, "double lid" dump has two lids with floor opening 5x7 in. "Single lid" type dump is made in two sizes: No. 58, for floor opening 5x8 in.; and No. 70, the largest and strongest, with deep flanges and anchoring lugs, for floor opening 7x10 in.

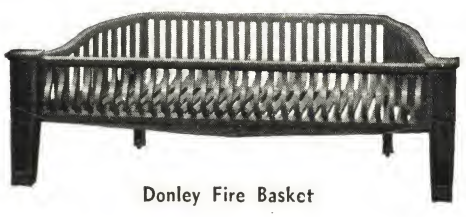
Two-lid Type

One-lid Type

Donley Fire Baskets

Donley Fire Baskets are beautiful and substantial pieces of fireplace equipment. They harmonize with any style of fireplace. These baskets narrow toward the rear at just the degree to fit a properly splayed hearth plan as shown in the plans above. They have removable ends for burning wood.

Donley Fire Baskets are made in 24, 28, 30, 34 and 40-in. front dimensions; and in 12½, 16½, 18½, 22½ and 28½-in. corresponding back widths. All sizes are 15 in. deep.



Donley Fire Basket

GABRIEL STEEL COMPANY

Manufacturers of Rolled Steel Products

13700 Sherwood Avenue, DETROIT, MICH.

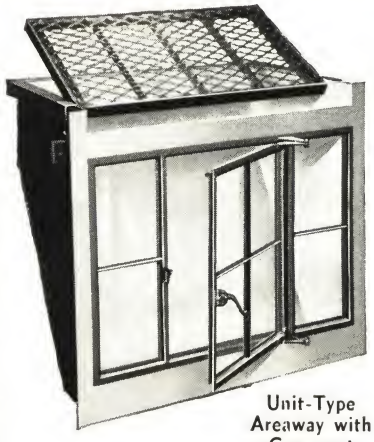
Products

UNIT-TYPE AREAWAY; ROLLED STEEL COAL CHUTES; FIREPLACE DOME DAMPERS; ASH DUMPS; ASH PIT DOORS; PACKAGE and GARBAGE RECEIVERS; STEEL TRUSS JOISTS.

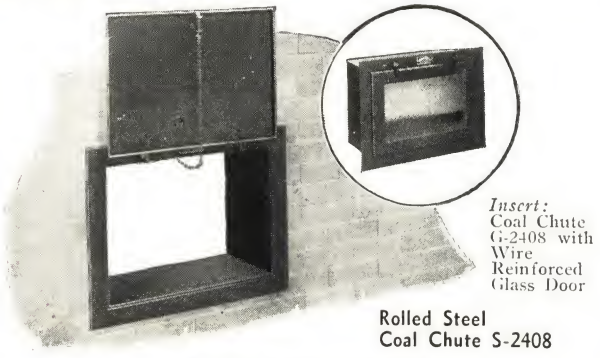
GABRIEL ROLLED STEEL PRODUCTS

Gabriel Unit-type Areaway

Fills a long felt need for a practical areaway unit of permanent construction. Made from wrought iron plate electrically arc welded into a permanent watertight unit. Interior is cadmium plated and painted with a high grade aluminum paint to produce highly efficient reflecting surfaces. A complete unit—including sash and grating. Available with two types of steel sash—an eight-light casement with a four-light ventilator swinging in on projected hinges, and a standard basement sash either top or bottom hinged. Casement type is particularly suitable for use in basement recreation or play rooms.



Unit-Type Areaway with Casement Sash



Insert: Coal Chute G-2408 with Wire Reinforced Glass Door

Rolled Steel Coal Chute S-2408

Gabriel Rolled Steel Coal Chute

Neat and attractive in appearance. Made from rust-resisting copper-bearing rolled steel, eliminating any possibility of breakage of frames, doors or hinges. All fittings are parkerized to prevent rust and to insure free easy operation at all times. Hinges are of very heavy rolled steel and are designed to hold door in a vertical position when open. All joints are electrically welded to insure strength and rigidity. Equipped with heavy rolled steel automatic latches provided with roller and chain attachment for operation from any desired point in the building. Gabriel Coal Chute Hoppers are easily attached or detached and lie flat in bottom of chute when not in use.

Gabriel Store Front Coal Chutes

The same neat, attractive appearance which individualizes other Gabriel products has been incorporated in the construction of Gabriel Store Front Chutes. Made from rust-resisting copper-bearing rolled steel. All operating parts are parkerized to insure easy operation and prevent rust. Equipped with heavy automatic burglarproof locks with chain and roller device for operation from any desired point. Made with 12-in. boot to fit opening 24x16 ins.

Store Front Coal Chute

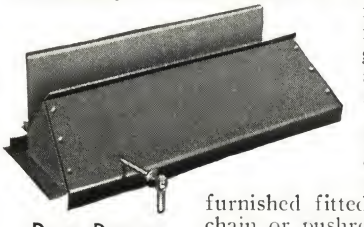
Gabriel Grade Line Coal Chute

Made from heavy copper-bearing rolled steel. Door is of extra heavy checkered plate with solid brass hinge pins. All joints are electrically welded—no bolts or rivets to work loose. The practical design, careful workmanship and extremely rugged construction of this chute are instantly evident upon inspection. Made with 16-in. boots to fit openings 25x21 ins.

Grade Line Coal Chute

Gabriel Rolled Steel Dome Damper

Accurately controls draft, promotes cleanliness, and saves fuel. Its vertical front flange permits its use regardless of design or construction of fireplace and seals the joint between rough brick and fireplace facing. It is substantially constructed and anchors securely in position. Can be furnished fitted with either handle, poker, chain or pushrod operators. Six standard sizes: 24, 30, 32, 36, 42 and 48 ins., with or without horizontal front angle.



Dome Damper for Fireplace Chimneys

Gabriel Ash Dump and Ash Pit Door

Ash dump is made with non-removable leaf; frame is electrically welded and is extremely heavy to eliminate warping or damage from hard usage. Made in two sizes for 5x7 and 4x8-in. opening.

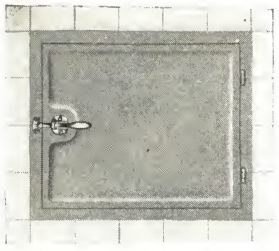
Ash pit door is rust-resisting rolled steel. Frame is electrically welded and door is a single piece of heavy steel plate with exceptionally true fit insuring a practically airtight closure. Four deep lug anchors are provided to facilitate installation and insure secure anchorage in chimney. Four standard sizes: 8x8, 8x10, 10x12, and 12x16 ins.

Ash Pit Door

Ash Dump

Gabriel Package Receivers

Neat, inconspicuous and weathertight. Design and quality workmanship insure satisfactory operation year after year. Manufactured from heavy steel plate, with two latched doors—one outside and one inside. Handles are designed to permit installation in an inverted position if necessary. Made in three depths—5, 9 and 13 ins.—to fit wall opening 12x14 ins. Width permits installation between studs of standard 16-in. spacing.



Inside Door Package Receiver (Inside Door)

Gabriel Steel Truss Joists

The GABRIEL STEEL COMPANY also manufactures an improved steel truss joist for wood and concrete floors. All Gabriel Steel Truss Joists are designed and detailed in strict accordance with standards and specifications of the Steel Joist Institute as adopted August 20, 1929 and December 20, 1928.

KEWANEE MANUFACTURING COMPANY

Basement Coal Chutes and Other Building Products

1600 Burlington Avenue, KEWANEE, ILL.

NATIONALLY DISTRIBUTED THROUGH DEALERS IN BUILDING MATERIAL

Products

KEWANEE COPPER STEEL BASEMENT COAL CHUTES of Window, Store and Grade Line Types.

Also Fireplace Dampers, Ash Dumps, Clean-out Doors, Package Receivers, Built-in Mail Chutes, Garbage Receivers, and other Building Products.

For Kewanee Copper Steel Basement Windows and Kewanee Steel Utility Windows, see Manufacturers' Index.

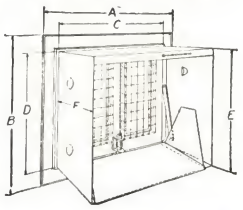
Kewanee Copper Steel Basement Coal Chutes

Advantages—Kewanee Coal Chutes facilitate the delivery of coal to the basement and increase the value of the property. They withstand the hard knocks which shatter ordinary construction, protect the building from damage and defacement and are convenient to use. The saving in repair bills alone quickly pays for a Kewanee Coal Chute. All parts are of Keystone copper steel, a special alloy which is rust-resistant and tougher than ordinary steel. Every Kewanee Chute is guaranteed against breakage and warranted to give satisfactory service.

Window Type—The type most commonly used, being designed for buildings with foundation walls extending sufficiently above the grade line. The three typical styles of Kewanee Window Chutes are illustrated below.

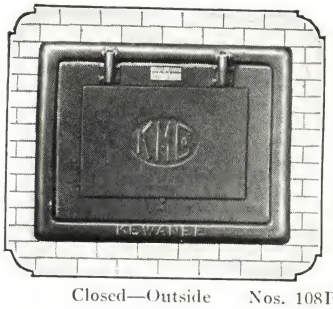
The frames of Kewanee Window Chutes are pressed out of one piece of heavy copper steel. Flat bottom bodies 8 in. deep, or sloping bottom bodies 12 in. deep are regularly furnished, but sloping bottom bodies 18 in. or more deep, can be supplied on special orders. Chutes are furnished with either the Style P ("Plain") door or Style G ("Glass") door, the latter admitting daylight to the coal bin. The ¼-in. glass panels are protected by heavy wire guards. All top-hung doors have slotted hinges which hold the door upright when opened.

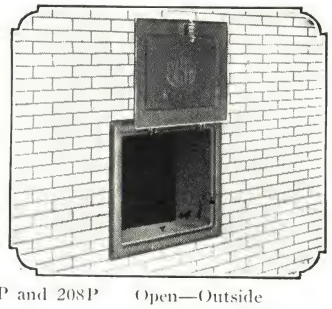
In Style PC Chutes ("Plain" door, "Combination" hopper) the door is hinged at the bottom, and in combination with wings, forms a convenient and substantial hopper. The wall-protecting shield automatically raises and lowers with opening and closing of door. In the Style GI Chute illustrated ("Glass" door, "Independent" hopper) the hopper is independent of door. By means of posts just within frame, an independent hopper can be readily attached to any Style "P" or Style "G" Chutes listed. The automatic and positive latch can be readily operated with cord or chain from any place in the building.



No.	Size known as	Door	Hopper	Dimensions in inches					
				A	B	C	D	E	F
108-P	24x17	Plain	None	26	20½	21½	16	16	8
112-P	24x17	Plain	None	26	20½	21½	16	18½	12*
112-PC	24x17	Plain	Comb.	26	20½	21½	16	18½	12*
208-P	33x22	Plain	None	33	25	28½	20½	20½	8
212-P	33x22	Plain	None	33	25	28½	20½	23	12†
212-PC	33x22	Plain	Comb.	33	25	28½	20½	23	12†
108-G	24x17	Glass	None	26	20½	21½	16	16	8
112-G	24x17	Glass	None	26	20½	21½	16	18½	12*
112-GI	24x17	Glass	Ind.	26	20½	21½	16	18½	12*
208-G	33x22	Glass	None	33	25	28½	20½	20½	8
212-G	33x22	Glass	None	33	25	28½	20½	23	12†
212-GI	33x22	Glass	Ind.	33	25	28½	20½	23	12†

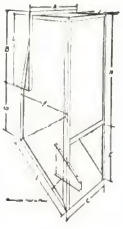
*Also furnished with body 18 in. deep (19½ in. high at back).
†Also furnished with body 18 in. deep (24 in. high at back).

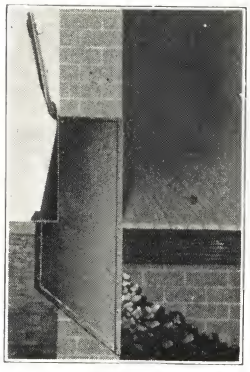




Closed—Outside Nos. 108P and 208P Open—Outside

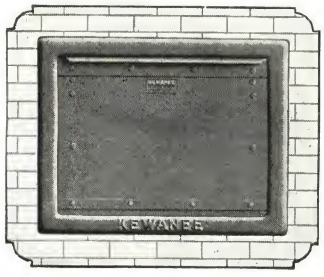
Store Type—For buildings where the first floor is not high enough to use the common window chute. The body conducts the coal downward within the wall for discharge into the basement. A foot at bottom supports the chute in upright position while wall is built around it.

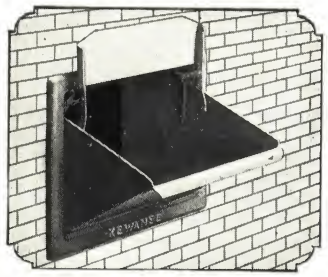




No.	Hopper	Dimensions in inches				
		A	B	C	D	E
31-P	None.....	26	22	24	21	17
31-PI	Independent	26	22	24	21	17
32-P	None.....	34½	26	31½	24	17
32-PI	Independent	34½	26	31½	24	17

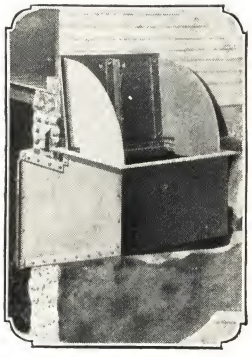
		F	G	H	I	J
31-P	None.....	16½	18	29	18	12
31-PI	Independent	16½	18	29	18	12
32-P	None.....	16½	18	34	18	12
32-PI	Independent	16½	18	34	18	12

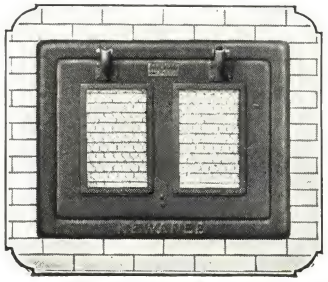




Closed—Outside Nos. 112PC and 212PC Open—Outside

Grade Line Type—Another type designed for buildings with low first-floor levels; ruggedly built throughout to withstand hard usage. The door closes down over a lip around the opening which prevents rain and snow from entering.





Closed—Outside Nos. 112GI and 212GI Open—Outside

No.	Hopper	Dimensions in inches									
		A	B	C	D	E	F	G	H	I	J
21	.....	28½	22	25½	19	25	37½	18	3	16	18½
22	.....	34½	28	31½	25	31	43½	18	3	19	24

THE MAJESTIC COMPANY

Manufacturers of Breakproof Coal Windows and Building Specialties

HUNTINGTON, IND.

DISTRIBUTED THROUGH 9000 HARDWARE, BUILDING SUPPLY AND LUMBER DEALERS

For Majestic Garage Doors, see Manufacturers' Index

MAJESTIC COAL WINDOWS

This popular, sturdy window has won widespread preference because of the protection it gives to the entire opening and sidewall when coal is being deposited in the bin. It protects the building *above* the window where protection is most needed—thus it saves its initial cost many times over and enhances property value by its permanence, sightliness and convenience.

Built for permanent service—will withstand the most severe conditions of usage.

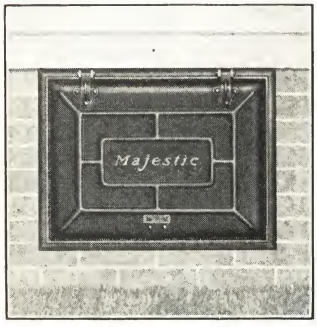
Backed by over 20 years' experience in building quality coal chutes.

Styles

Majestic coal windows are made in solid steel and in glass panel styles as follows:

No. M101 (Steel Door Style)—Equipped with sloping bottom body and chain to gravity catch.

No. M203 is the same as No. M101 but larger in size.



Closed

Majestic Coal Window Nos. M101 and M203

Closed

Majestic Coal Windows Nos. M10 and M20

No. M500 (Steel Door Style)—Differs only from No. M101 in that it has a 9-in. straight bottom body, without hopper or chain. No. M520 is the same, but larger.

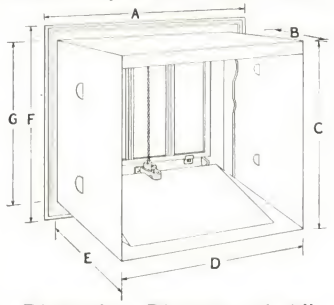
No. M10 (Glass Panel Style—Used when daylight is desired in the coal bin or basement. Has three lights of ¼-in. plate glass set in a ½-in. angle iron frame with two pressed steel dividing strips to give still more strength. Rubber packing is used instead of putty. The door is heavy, electro-galvanized steel, the glass being protected by a steel shield when open. Otherwise No. M10 is the same as No. M101.

Style A has a hopper. Style C is without hopper.

No. M20 is same as No. M10, but is larger in size.

Construction

The doors of Majestic coal windows are made of heavy pressed steel, electro-galvanized to resist rust. Frames are made of malleable iron. They set true in the masonry—no installation difficulties. Hinges are made of malleable iron. Unfailing burglarproof lock. Bodies and hoppers are made of Keystone copper steel and heavily reinforced at points of strain.



Dimension Diagram of All Styles of Majestic Coal Windows

STYLES AND SIZES OF MAJESTIC COAL WINDOWS

Steel door styles		Glass panel styles		Rough wall opening, in.		
No.	Style	No.	Style	Wide	High	Deep
M101	*B §D	M10	*A §C	23	17	12
M203	*B §D	M20	*A §C	32	22	17
M500	**	M600	**	23	17	9
M520	**	M620	**	32	22	12

*Furnished with hopper. §Furnished without hopper.
**Has straight bottom body—no hopper furnished.

Dimensions in inches							
No.	A	B	C	D	E	F	G
M101	24⅛	12	18¼	21¾	12½	18⅛	15½
M203	33	17	24¾	29½	17½	23½	20½
M500	24⅛	9	15½	21¾	9	18⅛	15½
M520	33	12	20½	29½	12	23½	20½
M 10	24⅛	12	18¼	21¾	12½	18⅛	15½
M 20	33	17	24¾	29½	17½	23½	20½
M600	24⅛	9	15½	21¾	9	18⅛	15½
M620	33	12	20½	29½	12	23½	20½

MAJESTIC MILK AND PACKAGE RECEIVER

Designed to hold 6 or more quart bottles of milk, depending on the thickness of the building wall in which it is installed. It consists of two cast iron frames and doors, connected by a steel body, adjustable to the thickness of the wall in which it is placed. Castings and steel body are coated with *bitumastic solution,* an enduring protection against rust.

The burglarproof gravity latch on the outside door can be unlocked only from inside. The kitchen side door is provided with a refrigerator type latch and handle and can not be opened from outside. Doors can be reversed at time of installation — either door can be installed inside or outside to open either to right or left by simply changing the gravity latch from one door to the other.

How Operated—A chain attached to gravity latch runs through two cast iron eyes to inside frame, where a cast iron ball is suspended. When empty bottles are placed in receiver, ball is pulled down; its weight, and friction of the chain holds the latch on outside door unlocked. Inside door is then closed and locked by the refrigerator latch.

When the outside door is opened, the chain is drawn outward and held by the friction. This leaves the gravity latch in locking position, and when the door is closed, it locks automatically.

Sizes—Made in three depths of adjustable bodies, adapting them to walls of any thickness.

No. 1 body adjustable to walls from 5 to 8 in. thick; No. 2, from 8 to 14 in. No. 3 from 14 to 22 in. Bodies of special depths furnished at additional cost.

Outside dimensions of package receiver frames, 16¼ in. wide, 14 in. high; wall opening required, 14 in. wide, 12 in. high.

Inside View

Section Through Wall

Outside View

Majestic Milk and Package Receiver

MAJESTIC COAL CHUTES

Grade Line Chute

The Majestic grade line coal chute is designed for buildings having little or no foundation above ground, as in low set or terraced homes, apartments, stores and office buildings.

Door swings upward and, when raised, forms part of the hopper and becomes a shield which protects the building when coal is delivered. When closed, the door locks automatically and is burglarproof.

Breakproof construction throughout. Frame, door and hinges are of certified malleable iron, with solid brass pins; body of keystone copper steel, reinforced with angle iron. The door fits snugly over the top of the frame when closed. This feature, with the waterproofing ridge around the inside edge of the frame, gives an absolutely watertight job.

Strong and durable—will outlast any building in which it is installed.

Prices on special bodies on request.

Store Chute

The Majestic store coal chute is designed particularly for store and office buildings, where the first floor is on a line with the sidewalk or alley.

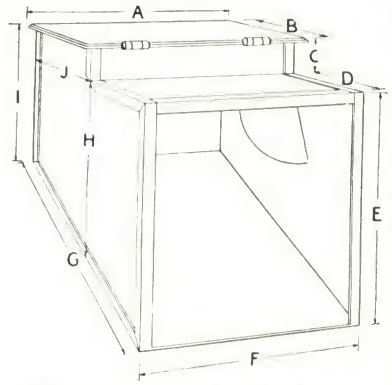
It does away with the dangerous sidewalk coalhole and the necessity of putting up a bond for the protection of pedestrians.

Frame and hinges are certified malleable iron; doors of heavy gauge pressed steel, electro-galvanized to resist rust.

Two sizes, with or without hoppers. Style "B" with hopper. Style "D" without hopper.

On special order, the Majestic store chute can be supplied with a duplex body so that coal can be deposited either under the sidewalk or in the basement as desired.

Prices on special bodies on request.



Dimension Diagram of Majestic Grade Line Coal Chutes

SIZES OF MAJESTIC GRADE LINE CHUTES

No.	Door opening, in.	Rough wall opening (inches)
M16	23¼x18¼	25 x 25
M18	29x24	31 x 31

Dimensions in Inches

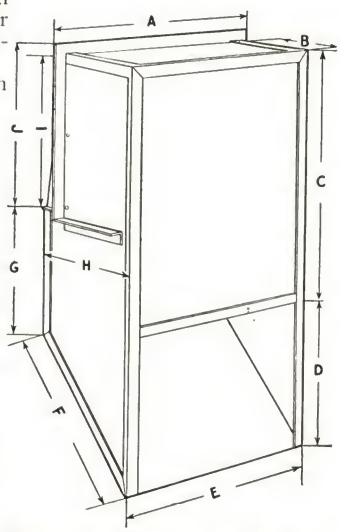
No.	A	B	C	D	E	F	G	H	I	J
M16	26	21	4	15½	24½	24¼	36½	19	16¾	19¼
M18	31¾	27	4	17	31	31	45	24	19½	25¼

SIZES OF MAJESTIC STORE CHUTES

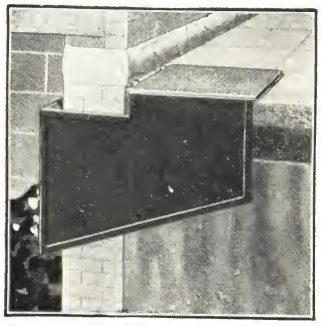
No.	Door opening, in.	Rough wall opening (inches)	
		Above grade	Below grade
M12	21x15	23x16¾	23x25
M15	29x19¼	31x21½	31x24½

Dimensions in Inches

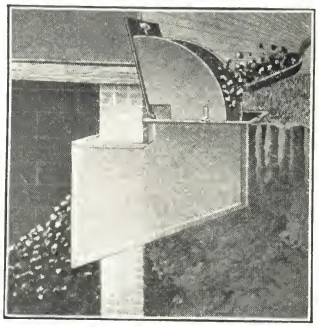
No.	A	B	C	D	E	F	G	H	I	J
M12	25	11½	26⅜	15¼	23	19½	13	15½	17	18
M15	33½	11½	30	16	30⅞	19½	13	15½	21¼	22½



Dimension Diagram of Majestic Store Coal Chutes

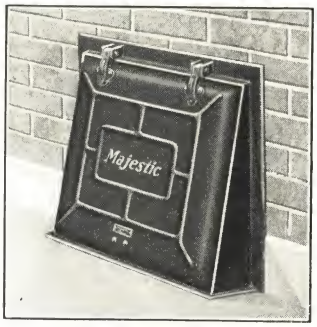


Closed

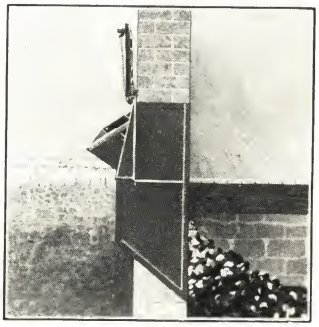


Open

Majestic Grade Line Coal Chute



Closed



Open

Majestic Store Coal Chute

MAJESTIC PORTABLE INCINERATORS

Majestic Portable Incinerator

Construction—The legs, base, grate frame, grate top, inner lining of combustion chamber and lid are made of cast semisteel.

The inner shell of 16-gauge Keystone copper steel and the outer shell of 22-gauge Keystone copper steel are separated by a ½-in. air space. The double shell holds the heat within, keeps the outside cool and protects the finish.

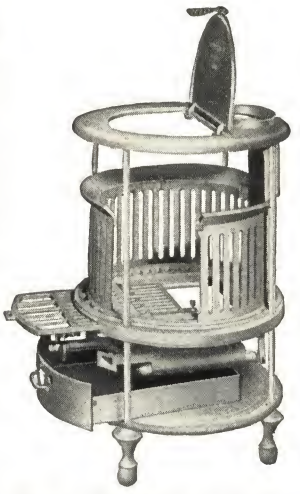
The finish is durable Alcoa aluminum and is heat resisting and attractive in appearance. The draw type grate is so placed in the incinerator that withdrawal of the grate leaves a 12x12-in. opening into ash pan through which any incombustible material may pass without obstruction. The 11-in. wide by 16-in. long semicircular openings in the top permit easy charging of large packages of refuse. The smoke outlet is 8-in. diam.

The Majestic Hi-Lo gas burner is equipped with a series of patented self-mixing tips. Burns any kind of gas.

SIZES AND PRICES—MAJESTIC BASEMENT INCINERATORS

No.	Capacity, bu.	Height, over all, in.	Diam., in.	Size of flue, in.	Gas input per hr., ft.	Service connection, in.	Shipping wt., lb.	List price	Code
1	3	36	24	8	50	½	270	$49.50	Burn

Prices on Time-O-Stat gas control on application.
Prices slightly higher west of Denver.

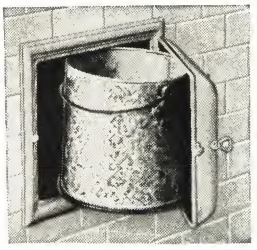


Shells Removed to Show Construction

MAJESTIC GARBAGE RECEIVERS

3A and 5A Apartment Receiver—Consists of a heavy cast iron frame and door, a galvanized iron body which recesses in wall, and a galvanized iron garbage pail which sits on a cast iron shelf fastened to the door. When door is opened, can is ready to receive garbage. Receiver is vented through wall by cast iron ventilator furnished with each receiver.

4A and 7A Apartment Receiver—Same as 3A and 5A except that can does not swing out on door shelf.



No. 3A and 5A

Underground Receiver—The receiver is buried in ground. When foot pressure is released, lid snaps tightly shut, preventing escape of odors. Can is easily lifted out when full.

MAJESTIC APARTMENT AND BUILT-IN GARBAGE RECEIVERS

No.	*Can capacity, gal.	Wall openings, in.			Size over all, in.	
		Wide	High	Deep	Wide	High
3A (Apartment)	3	14½	12	10	16½	14
4A (Apartment)	4	14½	12	10	16½	14
5A (Apartment)	5	14½	16½	10	16⅝	19¼
7A (Apartment)	7	14½	16½	10	16⅝	19¼

*One galvanized iron garbage can furnished with each receiver.

MAJESTIC ACCESS UNITS—UNIVERSAL TYPE

These units provide access to concealed piping, wiring, etc. Their universal type of construction provides for both hinged and loose panel type in one unit. The hinge arrangement permits complete removal of door by simply removing one screw which holds the lower hinge pin in place.

The frames are of 18-gauge and the doors of ⅛-in. stretcher leveled steel. The door locks firmly in place.

PRICE LIST FOR ACCESS UNITS

No.	Panel size, in.	Wall opening, in.	Weight, lb.	Price each
100	8 x10	8½x10½	4	$3.50
200	13 5/16x16	13¾x16½	6	4.50
300	13 5/16x24	13¾x24½	10	6.50
400	19 5/16x24	19¾x24½	14	7.50
500	19 5/16x30	19¾x30½	18	8.50

Prices slightly higher west of Denver.

MAJESTIC FIREPLACE DAMPERS

The Majestic damper is scientifically designed, simple in construction, easy to operate and gives perfect draft control. The Majestic throat is theoretically and practically correct, due to the built-on lintel, which assures the correct height of damper throat above finished opening—also correct position of damper. Installed in any reasonably well built fireplace, it insures absolute satisfaction. Smoking in the room is eliminated by the Majestic damper.

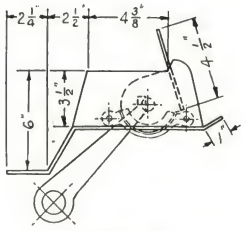
The lintel integral with the frame of the damper establishes the correct distance from the top of opening of fireplace to the top of throat, the most important dimension of the whole fireplace. It also makes it necessary to place the damper forward in the fireplace, thus leaving room for a smoke shelf behind.

Ease of operation is accomplished by the *trouble-proof friction principle for opening and closing the door or valve.* The operating lever is out of sight and easily moved forward or backward with a poker, and it stays in position until again adjusted. The throat opening is subject to the most minute adjustment, and there are no knobs or handles to protrude through the face of the fireplace.

The Majestic Type X, however, is supplied for those who prefer the face or knob control.

The valve is hinged at the back, which permits heat to be thrown out into the room, draws the smoke off from the nearest possible distance from the face of the fireplace, and aids the smoke shelf in turning the down-draft back up the chimney.

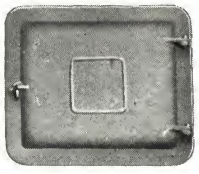
With the Majestic throat and damper any mason can build a perfect fireplace by following the drawings and instructions furnished with each damper.



Detail of Damper Operation

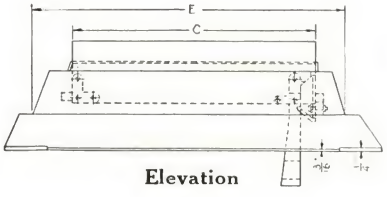
SIZES AND DIMENSIONS OF MAJESTIC FIREPLACE DAMPERS

Damper No.	26	30	34	38	42	46	50	54	60
A ..... in.	30½	34½	38½	42½	46½	50½	54½	58½	64½
B ..... in.	23¾	27¾	31¾	35¾	39¾	43¾	47¾	51¾	60½
C ..... in.	21½	25½	29½	33½	37½	41½	45½	49½	55½
D ..... in.	24	28	32	36	40	44	48	52	58
E ..... in.	26	30	34	38	42	46	50	54	60
Finished opening:									
Width, in.	26	28 30	32 34	36 38	40 42	44 46	48 50	52 54	58 60
Height, in.	28	29 30	30 31	31 31	31 32	32 32	32 32	32 32	32 32
Firebox depth, in.	16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24
Flue size, in.	8x8	8x12			12x12		12x16	12x18	12x18



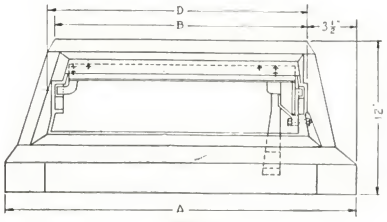
Majestic Cast Iron Ash Pit Door

Sizes 12x15 and 15x15 in.

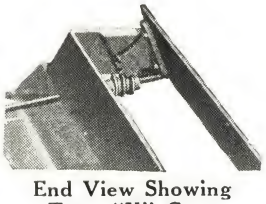


Elevation

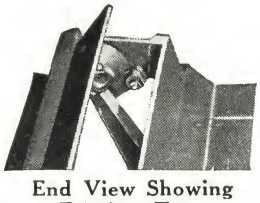
Majestic Fireplace Damper as Installed in Fireplace



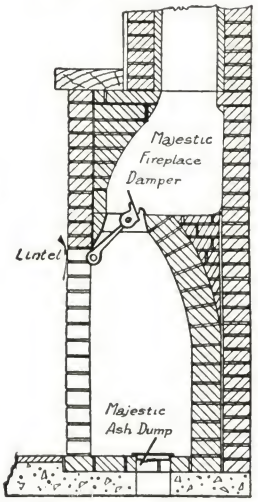
Plan



End View Showing Type "X" Control



End View Showing Friction Type of Control



Fireplace Section Showing Application of Damper

ESTABLISHED 1882

FLOCKHART FOUNDRY CO.

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MAIN OFFICE
87 Polk Street, NEWARK, N. J.

Products

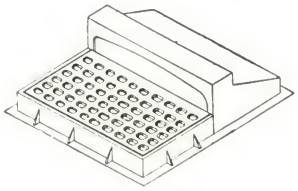
A complete line of CONSTRUCTION CASTINGS adapted for construction of highways, water works, storm and sanitary sewers, sewage disposal works, docks, gas and electric plants, etc.

Engineering Service

We maintain a specialized engineering service for the solution of particular problems. Service is rendered without charge to engineers.

Data Sheets

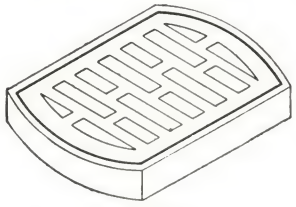
Data sheets are issued for all our products. These show all detail dimensions and other necessary information for ordering and installing. Write for them by number and description of product.



No. 25128

Large Curb Inlet

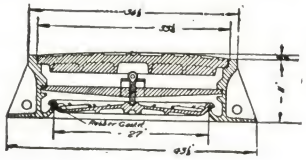
Strong design with heavily reinforced grating. Curb piece any height or radius. Grating, 48x22 in. Same type with grating 34½x21 and 29½x49 in.



No. 25477

Frame and Grating for Park Use

Size, 25x18 in. Depth, 2 in.



No. 26287

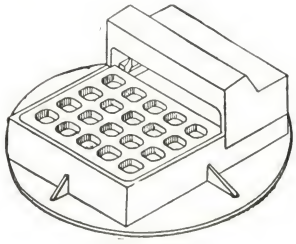
Waterproof Type of Manhole Frame and Cover

With rubber gasket and lock. Flange diameter, 46½ in. Minimum opening, 30 and 27 in. Also with high flange. Circular or square flange. Other openings 20½, 26½ and 38-in. diameter

No. 26560

Heavy Frame and Cover for Electrical Subways

Flange diameter, 43 in. Minimum opening, 24 in. Depth, 10 in. Also 27 and 30-in. diameter openings



No. 25263

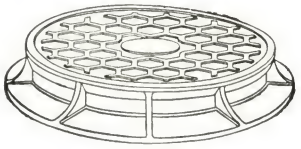
Small Curb Inlet

Curb piece any height or radius. Grating, 22¾x19¼ in. Plane or concave grating

No. 25054

Ring and Cover

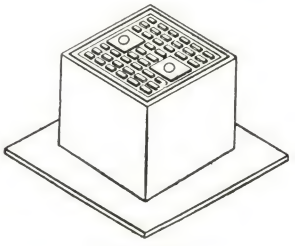
Diameter, 16, 18, 20, 22, 24, 30, 36 and 42 in. Made for light or heavy traffic. Adapted to concrete slab work



No. 25206

Heavy Manhole Frame and Cover

Flange diameter, 48⅜ in. Minimum opening, 36 in. Depth, 8 in. Also with minimum opening of 24, 30 and 42 in. The 36 and 42-in. sizes made with double concentric covers



No. 25403

Heavy Monument Box or Protection for Water or Gas Line Valves

Flange, 17 in. square. Minimum opening, 8⅝ in. Depth, 9 in. Also in light type

DATA SHEET NUMBERS

Classification	Max. opening, inches	Data sheet number
I Heavy frames and covers		
1. Circular—flange at bottom	48	134, 137
2. Circular—flange at top	48	133
3. Circular—sealed and locked	42	136, 162
4. Square	48	150, 153
5. Rectangular		151, 153
II Heavy frames and gratings		
1. Rectangular—plain surface	48x35	152
2. Rectangular—concave surface	28x48	144
III Light frames and covers		
1. Circular	48	138
2. Square	48	125
3. Rectangular		149
IV Light frames and gratings		170
V Curb inlets (catchbasin heads)		145
VI Catchbasin traps		146
VII Floor plates for light or heavy traffic, provided with angle seats; made also especially adapted for terrazzo and concrete fill		148
VIII Wheel guards, angles, etc., for building protection		182
IX Clean-out frames and doors		126
X Valves		
1. Flap		127
2. Lift		140
3. Shear		130
4. Slides		131
XI Mooring posts, bitts, chucks, cleats		171

THE SAMUEL J. CRESWELL IRON WORKS

Twenty-third and Cherry Streets
PHILADELPHIA, PA.

Products

Architectural Wrought and Cast Iron Work, and General Foundry Work, including Columns, Stairways (straight and spiral), Wheel Guards, Standards, Manhole Doors and Frames, Fenders, Roadway Drain Grates and Frames, Vault Plates and Frames, Ash Pit Doors and Frames, Cleanout Doors and Frames, Trench Covers and Frames, Cesspools, Drain Gutters, Pavement Doors, Gates and Grilles, Post Caps, Railings, etc.

Facilities

The Samuel J. Creswell Iron Works is one of the largest and best equipped plants in the vicinity of Philadelphia for the production of the various kinds of architectural wrought and cast iron work mentioned above. This company also manufactures pressed steel stairways in addition to the wrought and cast iron variety. They have installed them in many of the largest buildings in Philadelphia and other cities.

General Foundry Work

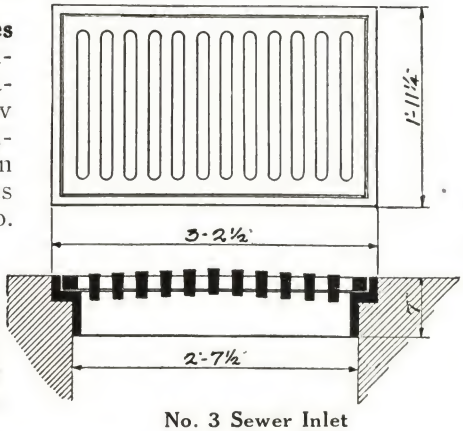
In addition to architectural work, a fully equipped foundry is prepared to produce special castings and do general foundry work, including cast iron ornamental or plain columns from stock designs (sent on request) or to architects' designs.

Stock Specialties

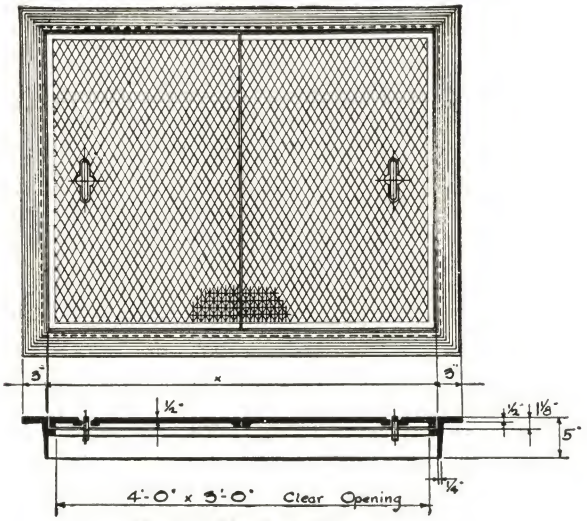
The accompanying illustrations show a few specialties regularly carried in stock. The prices quoted are f. o. b. Philadelphia.

Catalogue

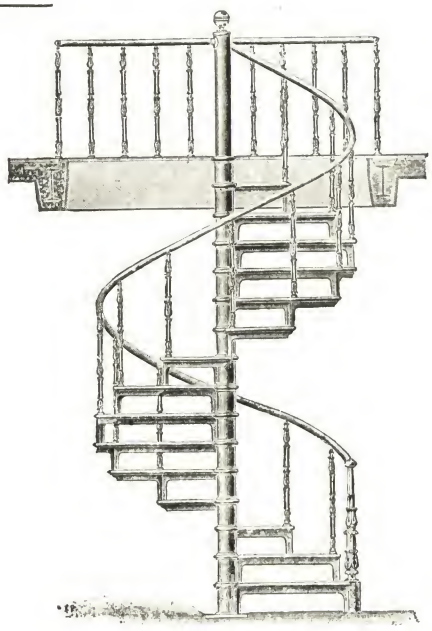
A catalogue illustrating the entire line, and discounts, will be sent on request.



No. 3 Sewer Inlet
Price, $22.00



No. 34 Manhole Cover
Price, $45.00. Extra heavy pattern, price, $54.00



Spiral Stairway
Following sizes stock pattern, 3′6″, 4′, 4′6″, 5′, 5′6″ and 6′ diameters. Any height

No. 15 Fender
9″ projection
3′ 5″ high

Wall	Price
9″	$25.00
13″	25.50
18″	27.50
22″	30.00
24″	35.00

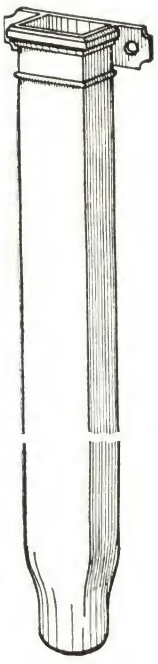
Can be made for walls to 36″ thick.

Nos. 16 and 17 Corner Fenders

Design No.	Projection	Height	Price
16	9″	3′ 5″	$10.00
17	9″	2′ 8″	9.00
17A	14″	3′ 0″	25.00
17B	8⅜″	2′ 0″	9.00

No. 9 Ash Dump for Fireplaces

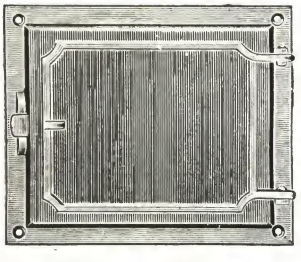
Opening	Price
6″ x 6″	$1.25
6″ x 8″	1.50



No. 4 Rain Conductor Shoes
3″x4″

Length	Price
5′0″	$10.00
4′0″	9.00
3′0″	7.00
2′0″	5.00
1′6″	4.00
1′0″	3.00

We have patterns for other sizes. Prices on application.



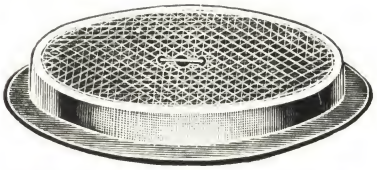
No. 8 Cleanout Doors and Frames

Width	Height	Price
20″	16″	$5.00
16″	24″	7.00
16″	12″	3.50
12″	12″	2.25
12″	10″	2.00
10″	8″	1.75
9″	7″	1.25
8″	6″	1.25
7″	5″	1.25

No. 1 Manhole Door and Frame

Width	Height	Price	Width	Height	Price
36″	36″	$42.00	24″	30″	$17.00
33″	49″	42.00	24″	24″	15.50
24″	48″	28.00	20″	24″	14.00
24″	36″	19.00	18″	24″	12.00

All manhole doors and frames have return flanges 4″ deep.



No. 3 Vault Plate and Frame; No. 4 Vault Grating and Frame

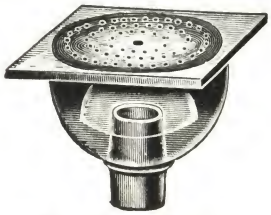
Size	Price	Size	Price
12″	$3.00	20″	$7.00
14″	4.00	24″	9.50
16″	5.00	30″	15.00
18″	6.00	34″	22.50

Depth of frame, 3″.

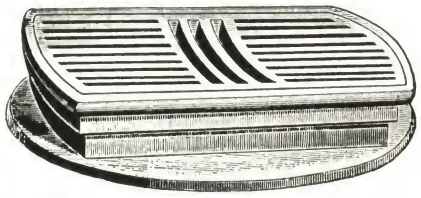
No. 7 Vault Plate and Frame; No. 8 Vault Grating and Frame

Size	Price	Size	Price
36″x36″	$32.50	7½″x7½″	$2.50
30″x30″	21.50	14″x24″	8.50
24″x24″	12.00	18″x24″	10.00
20″x20″	10.25	18″x30″	12.00
18″x18″	9.00	18″x36″	15.00
16″x16″	7.50	24″x30″	16.00
14″x14″	6.00	24″x36″	21.00
12″x12″	3.75	24″x42″	24.00
		24″x48″	30.00

Depth of frame, 3″.
All sizes can be made extra heavy at additional cost.

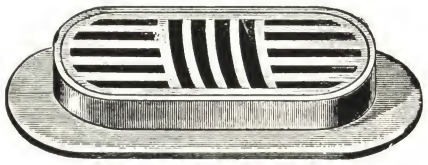


No. 21 Bell Trap
12″x12″, 4″ outlet.
Price, painted.....$3.00



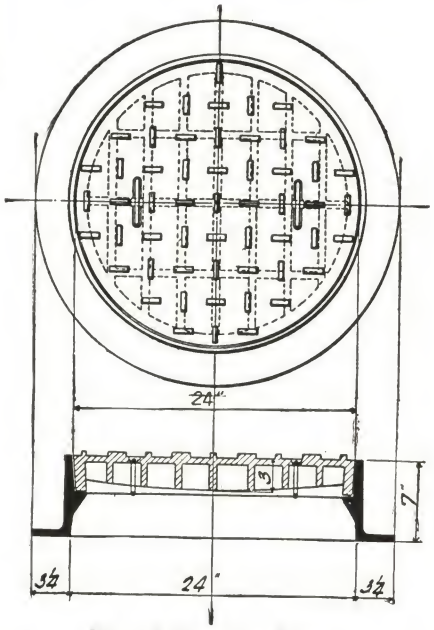
No. 10 Roadway Drain Grate and Frame

13¼″x24½″ grating.....$9.00
12 ″x18 ″ grating..... 8.00

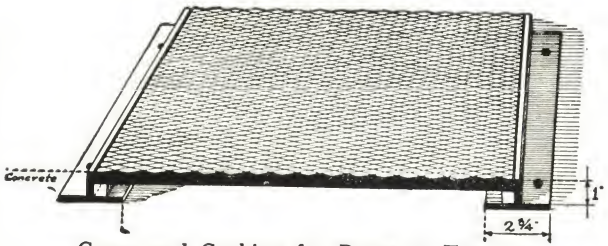


No. 11 Roadway Drain Grate and Frame

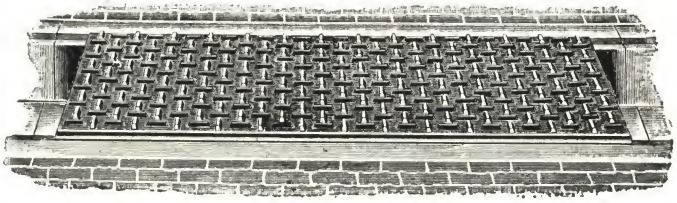
11 ″x22½″ grating.....$6.00
8¼″x17¼″ grating..... 4.00



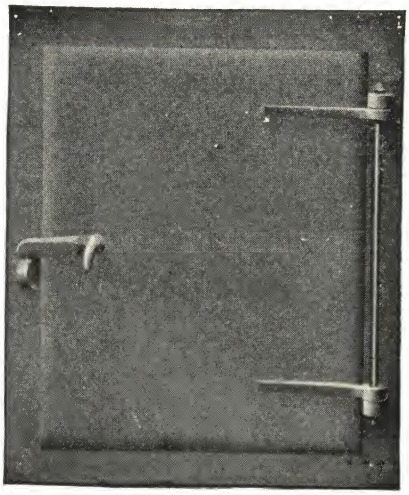
No. 19 Manhole Cover
Extra heavy for city use.....$15.30
With concrete or asphalt filled cover..... 22.00



Cover and Curbing for Ducts or Trenches
Plates made to suit conditions. Curbing carried in stock. Prices on application.

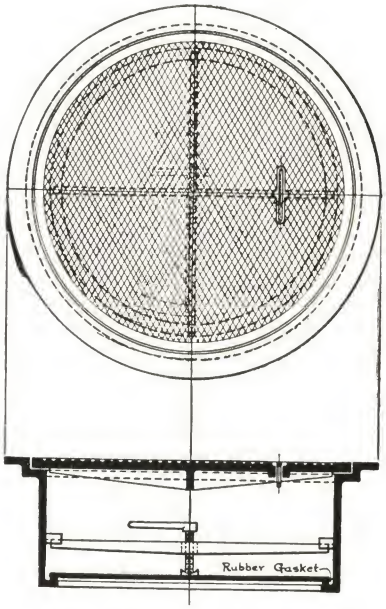


No. 28 Gutter Cover Plate
18″ wide, 1″ thick, $3.00 per lineal ft.
24″ wide, 1½″ thick, $6.00 per lineal ft.



No. 3 Manhole Door and Frame

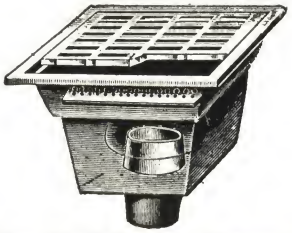
Width	Height	Price	Width	Height	Price
24″	36″	$19.00	16″	24″	$12.00
24″	24″	15.50	18″	18″	10.50
18″	24″	12.00			



No. 23 Manhole Cover with Inside Lid
Lock bar with brass screw

Size	Price
36″	$60.00
30″	42.50
24″	29.00
20″	26.50
18″	21.50

Depth of frame, 9″.



No. 22 Bell Trap Cesspool
16″x16″, 4″ outlet.
Price $6.00
12″x12″, 4″ outlet.
Price 4.50

WILLIAM R. PITT COMPOSITE IRON WORKS

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Banks and safe deposit companies
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Store entrances and windows
Churches and theatres
Private residences and apartments
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Steamships and ferryboats
Truck and delivery cars

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Every "Pitt" product is of the highest grade workmanship and materials, economically produced under modern conditions. They are strong, durable and easy working and take up very little space when not in use.

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This company is the original manufacturer of the "Bostwick" gate, and the originator of most of the standard folding gates, developing their uses through specialization. It is therefore, by training, experience and facilities, prepared to meet the demands of architects, builders and the iron trade.

"Pitt" gates are internationally famous for their quality, and are found in every State and many foreign countries.

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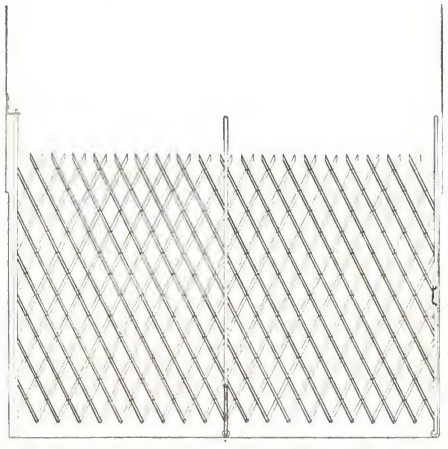
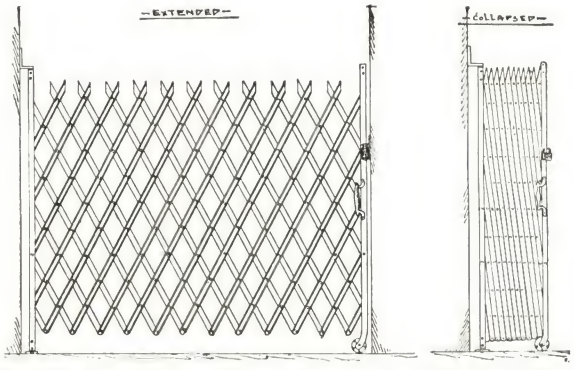
Copy the *number* and *description* of *gate desired* from the illustrations on this and the page following, *or* submit requirements for our advice and special *blueprints* or *designs.*

Folding Gate Estimates

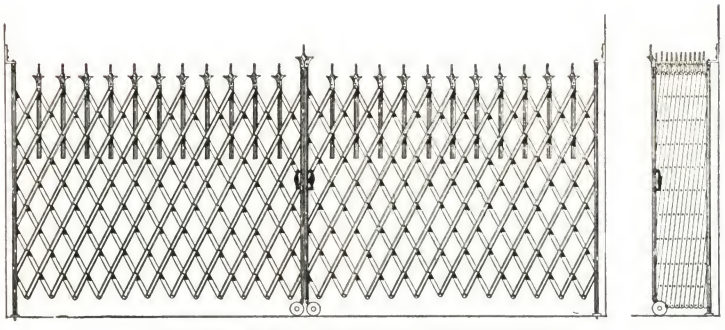
Send *plans* and *specifications,* or a *sketch* showing *width* and *height,* and *where* gate is to *set.* State *purpose* for which gate is *intended.*



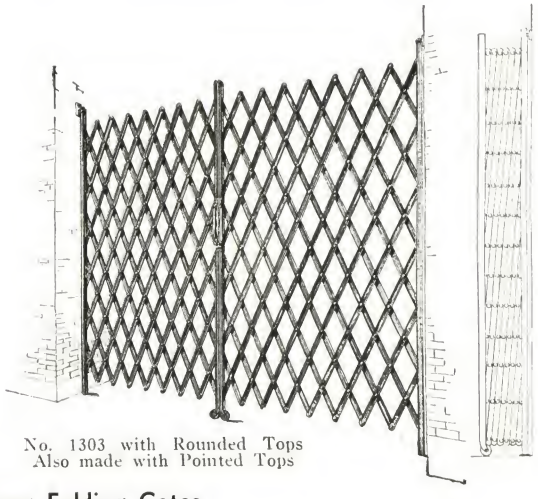
No. 1303-D with Pointed Tops. Also Made with Rounded Tops



No. 1303-A with Pointed Tops. Also made with Rounded Tops

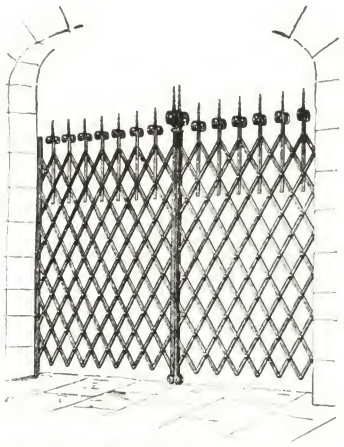


No. 1254-A with Ornamental Wrought Pickets

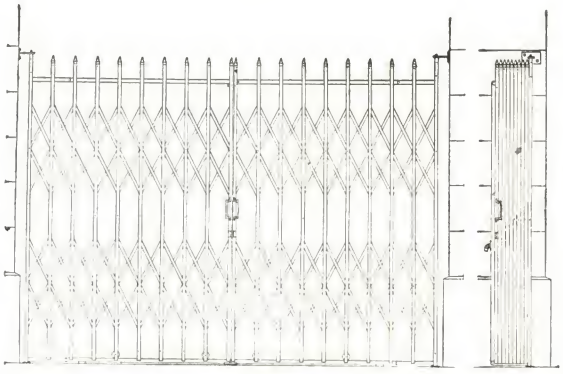


No. 1303 with Rounded Tops
Also made with Pointed Tops

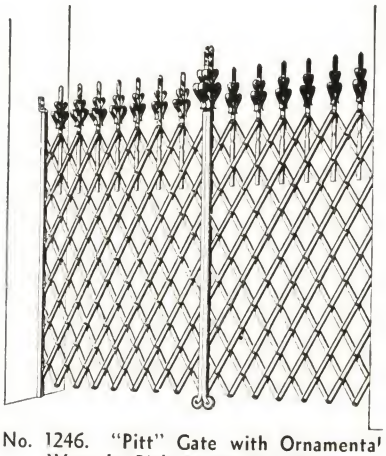
Standard Patterns, "Pitt" Lazy Tong Folding Gates



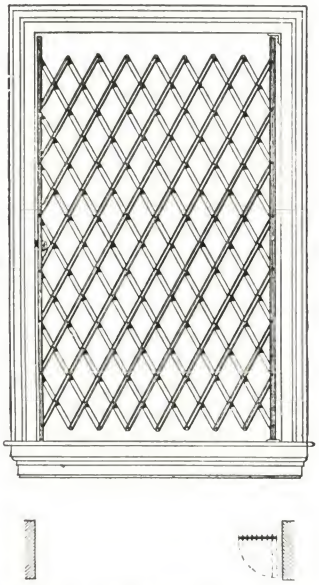
No. 1254. "Pitt" Gate, with Ornamental Wrought Pickets



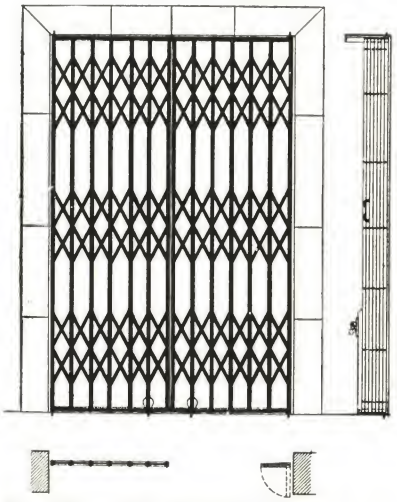
No. 1262. "Pitt-Bostwick" Gate with Cast Pickets, Hinged Stiffening Bars and Hinged Lifting Bottom Tracks



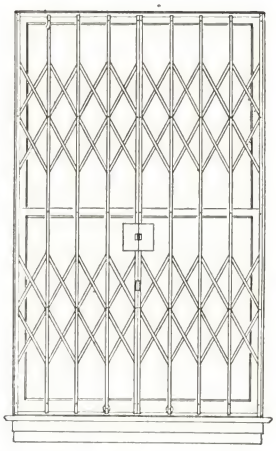
No. 1246. "Pitt" Gate with Ornamental Wrought Pickets and Ball Rivets



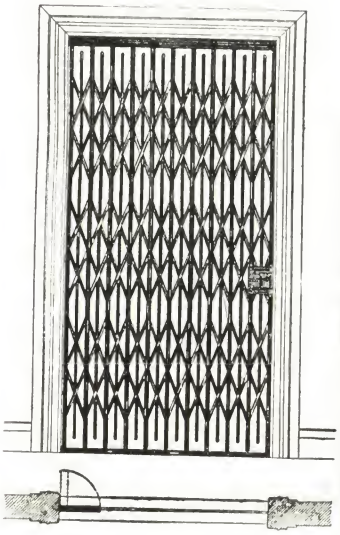
No. 1316. "Pitt" Lazy Tong Guard for Windows
No tracks



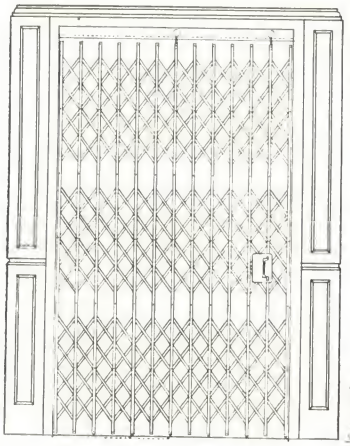
No. 1284. "Pitt-Bostwick" Vestibule or Window Gate with Stationary Top and Hinged Lifting Bottom Tracks



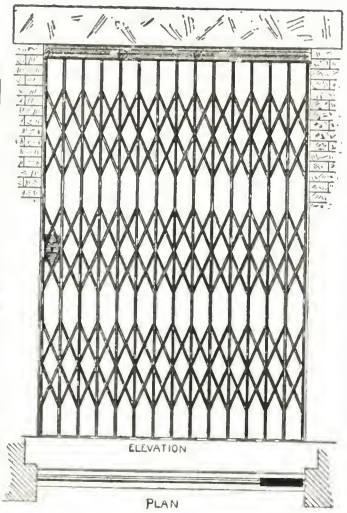
No. 1267. "Pitt-Bostwick" Guard for Window, with Stationary Top and Bottom Tracks
Can be arranged to fold and swing



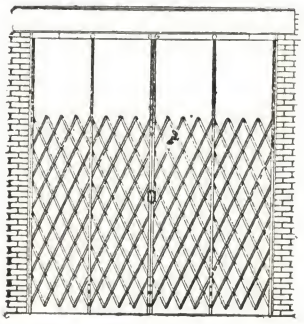
No. 1245. Close Mesh "Pitt-Bostwick" Gate with Track Top and Bottom



No. 1272. "Pitt-Bostwick" Gate with Tubular Top and Bottom Track Set Flush with Floor



No. 1282. "Pitt-Bostwick" Elevator Gate with Tubular Top Track



No. 1302. "Pitt" Lazy Tong Gate for Driveway Entrances
Can be arranged to fold and swing

WESTERN WIRE & IRON WORKS, INC.

Improved Folding Gates, Woven Wire Partitions, Wrought Iron Fences

TELEPHONE
CANal 6442

1820-1830 South Sangamon Street
CHICAGO, ILL.

Products

IMPROVED FOLDING GATES in steel, bronze, nickel silver and aluminum.

WOVEN WIRE PARTITIONS for banks, offices, factories, warehouses, stores, apartment buildings and post-offices.

WROUGHT IRON FENCES for residences, schools, estates, cemeteries and factories.

BANKERS APPROVED SLIDING DOOR LOCKS and SPEE-D BALL BEARING HANGERS for woven wire bank cages, partitions, elevators and steel partitions.

IMPROVED FOLDING GATES

Uses for the Folding Gate with a Backbone

School hall corridors.
Banks.
Public lobbies.
Office buildings.
Theatres and store spaces.
Restaurants.
Railroad stations.
Display windows.
Fountain lunches.
Cigar counters.

Outstanding Features of the Folding Gate with a Backbone

(1) "Marko" (patented) fully automatic top track stiffener.

(2) Top and bottom adjusting screws for perfect alignment and smoother operation.

(3) Self-contained built-in steel cabinets, and easier installation.

(4) Gates disappear when not in use. Prevents tampering.

(5) Fold-up bottom track with cabinet face plate attached.

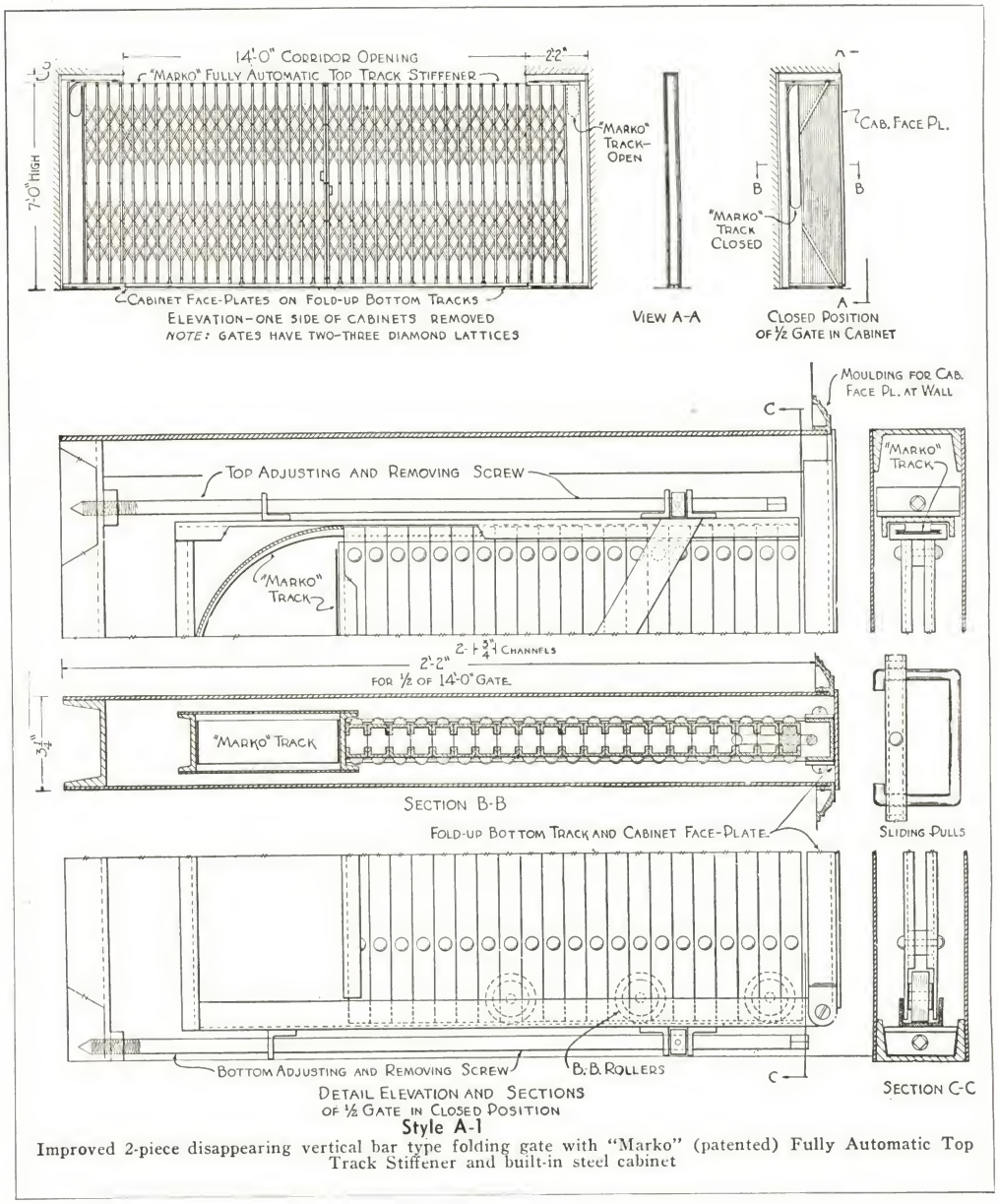
(6) Two 3-diamond lattices.

(7) Ball-bearing rollers.

(8) Complete one-man operation.

(9) Gates easily removable from cabinets for re-painting.

(10) Appearance and dignity in any location.



Style A-1

Improved 2-piece disappearing vertical bar type folding gate with "Marko" (patented) Fully Automatic Top Track Stiffener and built-in steel cabinet

Specifications for Improved Folding Gates

Furnish and install in locations as shown on drawings, Improved Vertical Bar Type Disappearing Folding Gates Style A-1, equipped with "Marko" Fully Automatic Top Track Stiffener, Built-in Steel Cabinets and Fold-up Bottom Tracks with Cabinet Face-plates attached, as manufactured by WESTERN WIRE & IRON WORKS, INC., Chicago, Ill. Gates to be 7 ft. high, made of steel painted prime coat gray, and arranged for padlocks. Leave all gates in first class working order.

WOVEN WIRE PARTITIONS

We manufacture woven wire mesh partitions for bank cages, offices and industrial uses, such as stock rooms, tool rooms, switchboard enclosures, store rooms for apartment buildings, department stores and warehouses, etc.

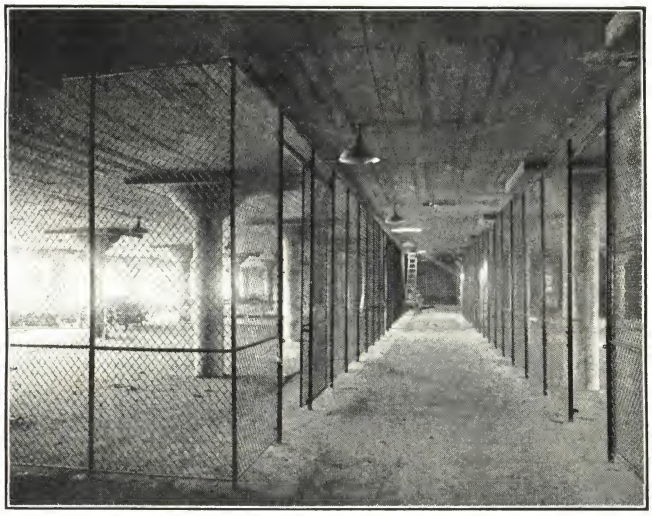


Fig. 5—Industrial Woven Wire Partition

Specifications for Industrial Partitions

Furnish and install Woven Wire Mesh Partitions extending from floor to ceiling, standard construction, made of No. 10 (.135) W&M gauge wire woven into 1½-in. diamond mesh with 1x½x⅛-in. channel iron frames, in sections 5 ft. wide with intermediate vertical flat bar stiffeners spaced not more than 15 ft. apart and securely anchored to floors and ceilings. Partitions to have two 1-in. horizontal channel stiffeners at 3 ft. 6 in. from floor, mortised and tenoned into vertical channels as an integral part of each section. At 8 ft. from floor and each 5 ft. thereafter place horizontal intermediate flat bar stiffeners same size at verticals. As shown on plan, place 4-ft. gravity sliding doors equipped with malleable iron Bankers Approved sliding door cylinder locks and Spee-d ball-bearing hangers, as manufactured by WESTERN WIRE & IRON WORKS, INC., Chicago, Ill. Paint all work dip-coat black enamel paint. Leave all partitions and doors in first class working order.

Note: For heavy duty partitions specify No. 8 (.162) W&M gauge wire, 1¼-in. diamond mesh with 1¼x½x⅛-in. channel iron frames and extra heavy stiffeners.

Specifications for Bank Cage and Office Partitions

Furnish and install Woven Wire Mesh Partitions 7 ft. high constructed of ⅛-in. square wire 1½-in. square mesh press crimp for upper portion, and ⅛-in. round wire 1½-in. diamond mesh press crimp for lower portion, all set in 1x½x⅛-in. channel iron frames with two 1-in. horizontal channel members at 3 ft. 6 in. from floor mortised and tenoned into vertical channels as an integral part of each section. Place 1½-in. square No. 16 gauge seamless steel (or bronze) tubing uprights with bronze floor sockets, at walls, corners, intersections, and at each side of doors. Top rails to be 1½x1½x$\frac{3}{16}$-in. continuous channel with 2x$\frac{3}{16}$-in. removable capping bar to allow placing of electric conduit. As shown on plan, place standard bronze hand-holes and baskets, revolving telephone compartments, and 2-ft. 6-in. gravity sliding doors equipped with bronze Bankers Approved sliding door cylinder locks and bronze Spee-d ball-bearing hangers to match as manufactured by WESTERN WIRE & IRON WORKS, INC., Chicago, Ill. Spray all steel work prime coat of gray paint. Leave all partitions and doors in first class working order.

Note: We are equipped to make bank cages in bronze, nickel silver, monel, aluminum and other special metals.

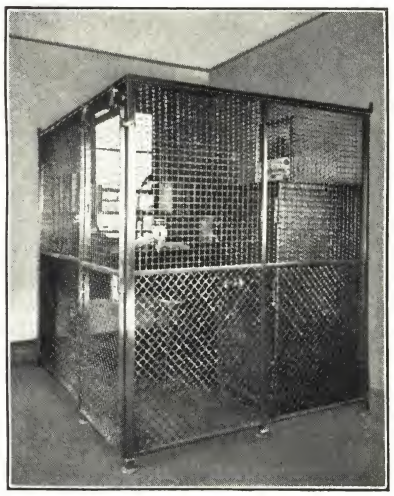


Fig. 6—Cashier Cage

Patented April 24, 1928

Fig. 7—Bankers Approved Sliding Door Lock

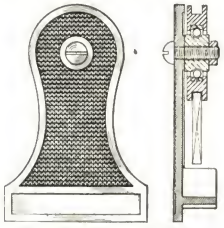


Fig. 8—Spee-d Ball-bearing Hanger

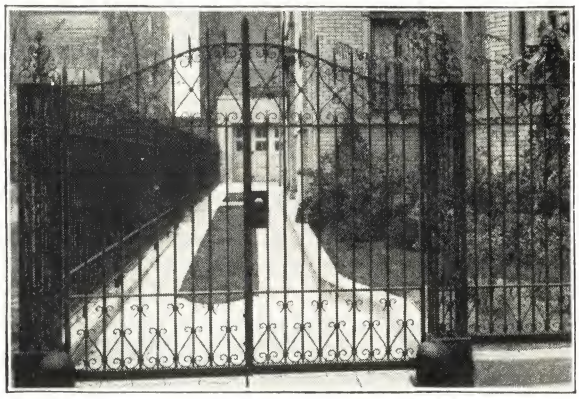
WROUGHT IRON FENCES

We specialize in the manufacture of wrought iron fences and gates to architects' designs.

Original and modern designs will be submitted upon request.

Illustration at the right shows an artistic wrought iron fence and entrance gates executed by WESTERN WIRE & IRON WORKS, INC., for a private residence, Chicago, Ill.

We have executed contracts for Large Drive Gates and Ornamental Iron Fences for Hospitals, Estates, Cemeteries, Industrial Concerns, State Institutions and Residences for many years. Names of owners and architects upon request.



FLOOR ACCESSORIES CO., INC.

Ankortite Floor Joiners and Thresholds

GENERAL OFFICE
KANSAS CITY, MO.

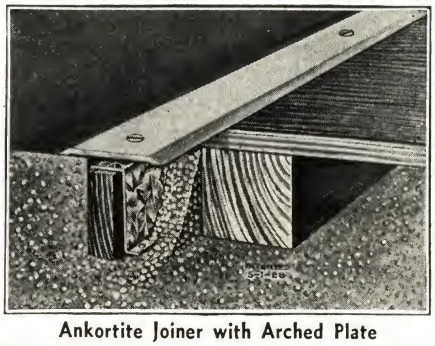
AGENTS IN PRINCIPAL CITIES

For Recessed Floor Bars and Terrazzo Dividing Bars, Masonry Slots and Shelf Angle Fixtures, and Tackless Carpet Strips, see Manufacturers' Index

Ankortite Floor Joiner

The Ankortite Floor Joiner is an attractive and economical connection for abutting floors that assures permanent anchorage and security of the cover plate by providing a tightening space to take up the looseness as floors shrink or wear.

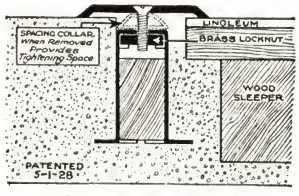
It consists of a cover plate attached to an assembled base. The cover plate is fastened with machined screws into the base assemblies, which are spaced approximately 9 in. apart along the joiner, depending upon the length of the joiner. The treated wood strip is used only to hold the anchor assemblies in place during installation of the joiner and serves no purpose thereafter. All of the other parts, being of non-corrosive material, become a part of the permanent floor construction. Each assembly contains a brass lock nut into which the screws fasten. Between the assembly and cover plate are temporary spacing collars which are removed after the joiner is anchored and provide a space for tightening the cover plates at any time, thereby assuring a tight floor connection throughout the life of the building.



Ankortite Joiner with Arched Plate

The arched plate, $\frac{5}{16}$ in. high, permits doors to swing free over the floor without an open space underneath when doors are closed

Ankortite Floor Joiners may be installed in remodeling old buildings as well as in new construction. The accompanying cross-section in detail shows the construction of the joiner—the brass lock nut into which the screws fasten; the temporary spacing collars; and the provision made for the screw travel in tightening the cover plate.

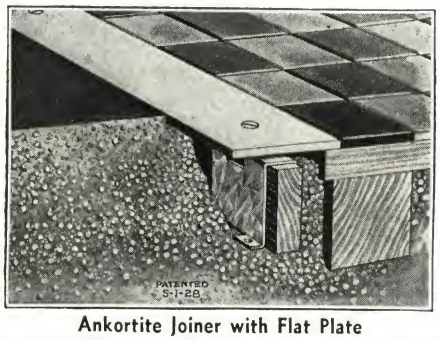


Cross Section Detail

Cover plates are furnished in extruded brass, architectural bronze or hardened white metal, either arched or flat, in standard widths of 2¼ and 3 in.

Ankortite Floor Joiner Assembled

Ankortite Floor Joiners are made to the lengths specified, assembled and ready to be placed. Simple installation instructions accompany each shipment



Ankortite Joiner with Flat Plate

Ankortite Floor Joiners with flat plate maintain a smooth level surface for abutting floors

Prices—Prices per linear foot, for either arched or flat plate, specified lengths, completely assembled and ready to install:

2¼ in. brass or bronze, polished	$1.25
3 in. brass or bronze, polished	1.50
2¼ in. white metal, polished	1.00
3 in. white metal, polished	1.25

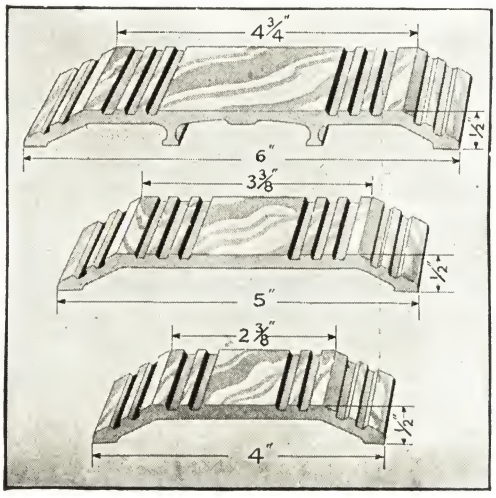
Specifications Floor Joint Connections

Wherever, throughout the work, floors of different materials adjoin, such as wood floors with concrete, terrazzo, marble, tile, linoleum, etc., install Ankortite [arched] [flat] Floor Joiners as made by the Floor Accessories Co., Inc., Kansas City, Missouri. Cover plates shall be of (state whether brass, bronze or white metal) and ..... inches in width. Set and attach the joiners in accordance with manufacturer's directions.

Ankortite Thresholds

Plain, Grooved and Interlocking

These patented thresholds are made from extruded brass, architectural bronze or hardened white metal of unusual strength and fine texture. They are perfectly formed, free from sand or air holes or other defects, and are beautifully finished. Prices on application.



HASLETT CHUTE AND CONVEYOR CO.

GENERAL SALES OFFICE
Real Estate Trust Building, PHILADELPHIA, PA.
FACTORY: OAKS, PA.

For Haslett Conveyors and Chutes, see Manufacturers' Index

SPIRAL AND STRAIGHT FIRE ESCAPE

Spiral Fire Escape

Housing—60-in. diameter. Base tier 24 in. high, 12-gauge galvanized steel. Second tier 48 in. high, 14-gauge galvanized steel. Upper tiers 16-gauge black steel.

Flat 16-gauge black steel top for inside installations. Outside installations conical top with 8-in. side apron 68 in. in diameter, 16-gauge galvanized steel.

Trough—28-in. wide concave bed, 16-gauge galvanized steel riveted to housing and securely bolted to 3-in. diameter standard weight steel pipe core.

Assembly—Escape made up in units approximately 90-in. high and provided with angle rings at each end, match punched. This construction facilitates proper erection by local labor when desired.

Intake—16-gauge black steel bonnet with non-slip steel plate floor equipped with double leaf steel doors. For outside installations floors perforated for ventilation and drainage.

Outlet—Double leaf galvanized steel doors equipped with kick bar which opens doors on contact with descending person.

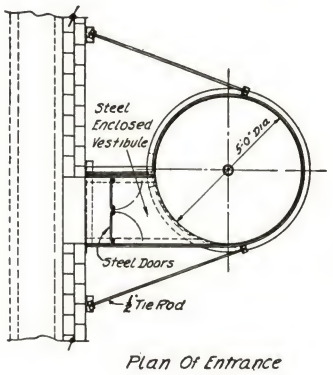
Painting—Black sheet and structural steel given one shop coat of gray lead and oil paint. Galvanized steel not painted.

Spiral Fire Escape

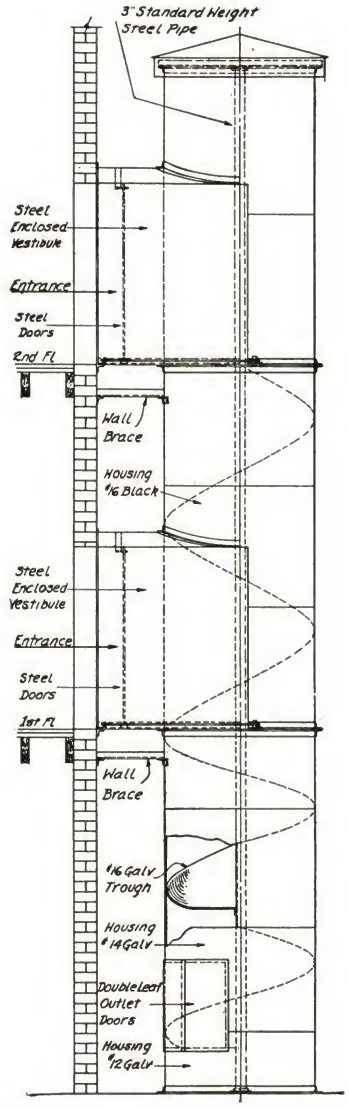
Straight Slide Fire Escape

Built and installed in locations where quick exit to a point remote from building is required.

This type escape is adapted to locations that do not permit space requirements of spiral escape.



Plan Of Entrance



Spiral Fire Escape
Typical Elevation

LOGAN CO.

Spiral Slide Escapes

500 North Buchanan Street
LOUISVILLE, KY.

MEMPHIS OFFICE, 63 South Third Street

REPRESENTATIVES IN PRINCIPAL CITIES

Products

Logan Spiral Slide Escapes for use on office buildings, apartments, hotels, schools, orphanages, hospitals and institutions.

For Logan Ornamental Iron Work, see Manufacturers' Index.

Facilities

A long established firm, equipped to execute contracts in any part of the country. We erect the escape complete.

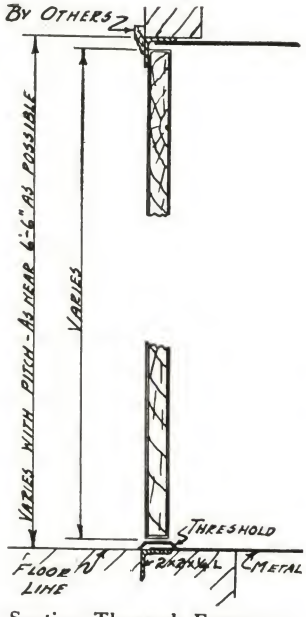
Advantages of the Spiral Slide Escape

Has an exit capacity three times greater than that of an ordinary stairway, but uses only 40% as much floor space.

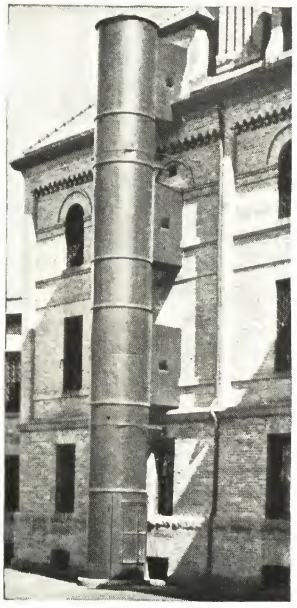
The cost compares very favorably with pressed steel stairs. In many cases the spiral escape is much cheaper.

There are no steps, consequently there is no chance for stumbling or falling.

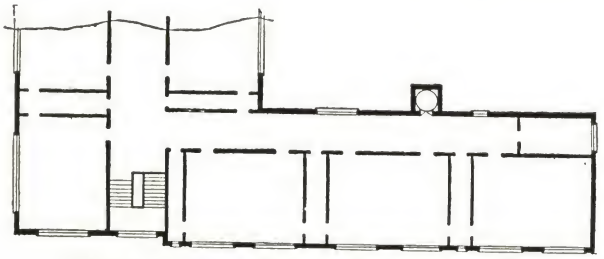
Escape can be entered from many floors at the same time. There is no acceleration, therefore escape can be used on thirty-story buildings just as safely as on one or two stories.



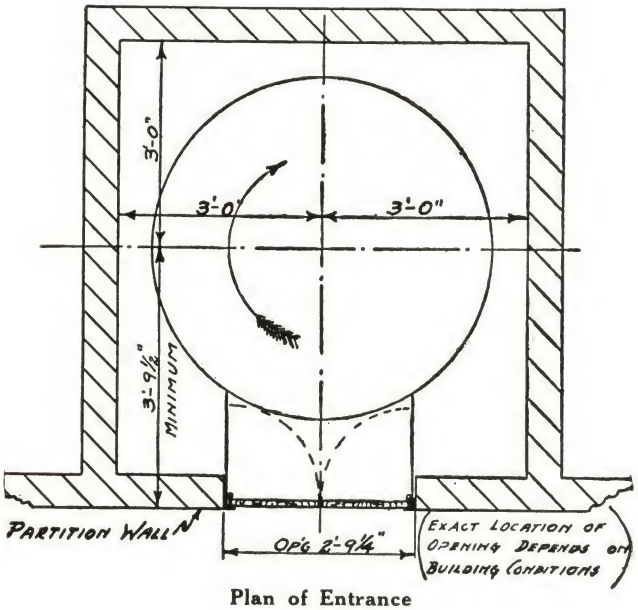
Section Through Entrance, Inside Installation



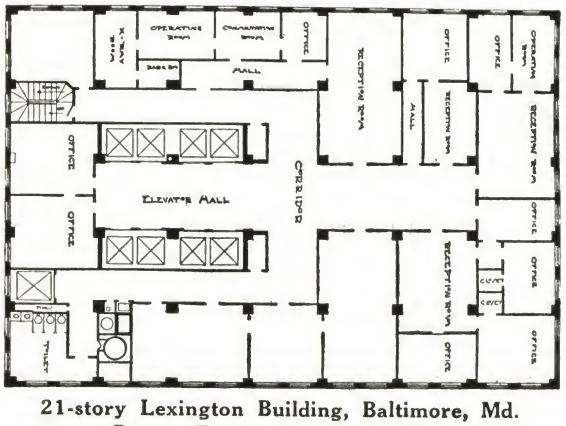
Outside Installation



Valena C. Jones School, New Orleans, La.



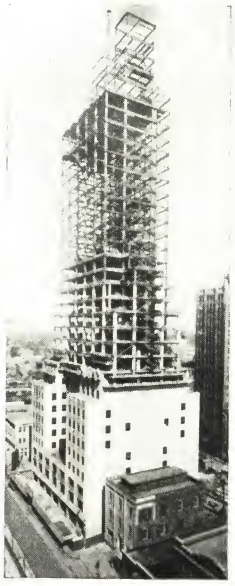
Plan of Entrance



21-story Lexington Building, Baltimore, Md.
Parker, Thomas & Rice, Architects

Installations

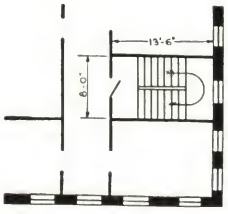
Space was saved by using only one stairway and a Logan Spiral, in these installations.



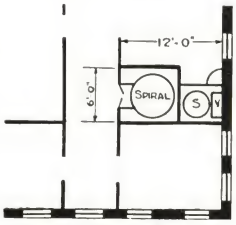
Citizen's National Bank
GRAHAM, ANDERSON, PROBST & WHITE, Architects

Left:

Ramsey Tower, Oklahoma City, Okla.
WALTER AHLSCHLAGER, Architect

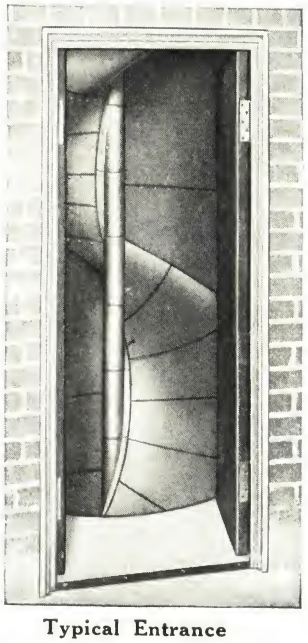


Minimum for 44-in. stair, 108 sq. ft.

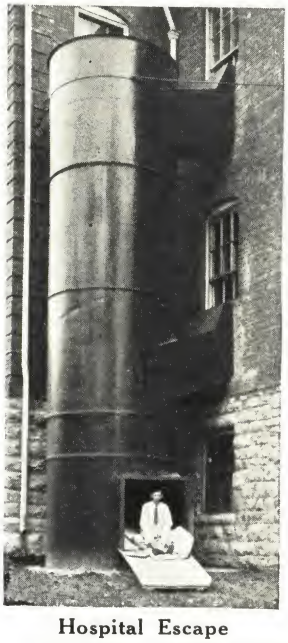


Logan Spiral, 39 sq. ft.

These sketches compare space required. Note the difference in extra rentable floor space made available by the spiral slide.



Typical Entrance
Inside installation with double doors



Hospital Escape
7-ft. diameter handles patients on standard 36-in. mattress—"No injury even to the worst hospital case"

Specifications

The fire escape shall be the Logan Spiral Slide Escape made by LOGAN CO., Louisville, Ky. It shall be placed upon a concrete foundation.

The escape proper shall be entirely of steel, 5 ft. in diameter, placed as shown on plans, and shall have one entrance at each floor above the first.

The cylinder shall be of No. 12 U. S. Standard gauge sheet steel, for the first 18 in.; the next 6 ft. of No. 14 gauge, and the remainder of No. 16.

The spiral slide shall be of No. 16 gauge galvanized sheet securely attached to a center core of 3 in. core I. D. standard black pipe.

Entrance doors shall be wood core metal covered, in pairs, equipped with single action spring hinges. (Omit this paragraph on outside installations.)

"Doors can be equipped with panic bar locks at additional expense—these provide protection against falling through entrance doors."

Exit doors shall be one leaf opening outward and provided with brass automatic inside latch with touchplate to operate by the pressure of the smallest child.

The entire escape shall be manufactured in assembled sections about 7 ft. high, with an angle ring at the top and bottom of each section, shall be set up at the factory to insure proper fitting, and each section properly marked to correspond with a setting diagram to be furnished by manufacturers. There shall be no projections of any sort on the upper surface of slide; all rivets being recessed and all edges of sheets ground smooth.

Entire escape except slide, which is galvanized, shall have one coat of best mineral paint at factory, and sufficient additional paint furnished to give a second coat after erection.

For Exterior Installations Add These Specifications—The roof shall be conical in shape of No. 16 gauge projecting not less than 4 in. beyond cylinder. Runway floor shall be of perforated sheet steel not less than No. 14 gauge on suitable angle framing with an enclosed vestibule provided at each entrance with entrance doors in two leaves each, arranged to swing in, and provided with springs.

Near the second or third story floor line and for each two stories above this point, the escape shall be securely braced to the building by a band and tie rod extending through wall and a strut of 3 in. inside diameter pipe with cast iron bearing shoes for cylinder and wall.

Note: Hospital escape is 7 ft. in diameter. Material sizes given are sufficient for a 65-ft. high escape, 5 ft. in diameter. On higher inside installations, brackets are provided to rest on floor construction. On higher exterior installations, heavier sheet steel is used. Escape weighs 100 lb. a vertical foot in the 5 ft. diameter.

POTTER MANUFACTURING CORPORATION

107 West Washington Street, CHICAGO, ILL.

Product

Potter Tubular Sliding Type Fire Escape—inspected by the Underwriters' Laboratories, Inc., and listed as standard.

Potter Spiral Sliding Type Fire Escape—Available for buildings of any height. Write for detailed specifications.

Potter Tubular Fire Escape

Designed especially for schools, hospitals, orphanages, homes for aged, insane asylums, etc., also for various industrial purposes where quick exit is desired. It consists of a copper-bearing galvanized sheet steel straight tube with entrances from room through doors equipped with panic bolt hardware and exit from horizontal section approximately at ground level. Supporting brackets every three or four sections. The incline of the tube for the school type escape is about 30° and for hospital type about 38° to horizontal.

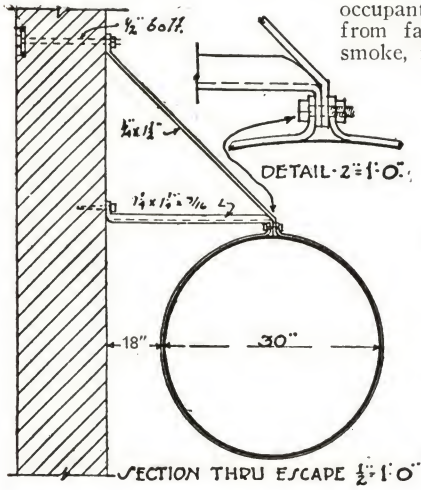
The Potter Tubular Fire Escape is available for buildings up to five stories in height. Can be built inside of new buildings. More than 3000 installations in the United States and Canada.

Advantages

It is safe, rapid, strong, durable and economical.

It is entered direct from the room, without the necessity of going out onto a platform, thus permitting quicker exit.

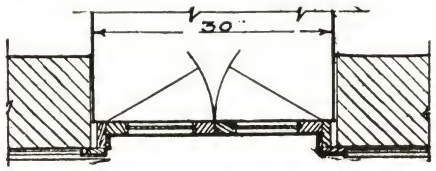
There is no possibility of any one who uses it getting hurt. Slipping, falling, stumbling, pushing and confusion are all eliminated. Being enclosed, the occupants are fully protected from falling obstacles, flames, smoke, ice and snow.

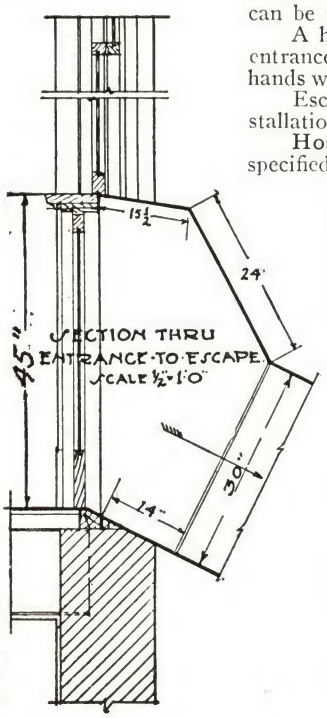


Sizes

The school type for two-story buildings is 30-in. diameter; for higher buildings it is 30-in. diameter from top floor and 36-in. diameter from the lower floors to the ground.

The hospital type is 36 in. in diameter. This size is recommended for hospitals, as it will accommodate bed-ridden patients on mattress.





Lower End of Hospital Type Escape

Specifications

School Type—All parts of the fire escape are constructed of 20-gauge, copper-bearing, galvanized steel. All galvanized joints are double seamed. No welding of metal parts is allowed as this destroys the galvanizing. Entrance to the escape to be 30 in. wide, 42 in. high, sections to be 30 in. in diameter and not more than 38 in. long and have 1¼x⅛-in. angle iron bands riveted to each end and be joined together by bolting the outside faces of the angle iron rings together with ¼x1-in. stove bolts. A channel iron band is placed over the top of the angle iron bands to make the joint watertight. The elbow shall have a sweep of 8 in. The easement or lower end breaks from the 30° angle to horizontal, is about 6 ft. long, flares from the 30 in. diameter to oval shape 36 in. high by 30 in. wide and rests on a concrete base 16 in. high, or is supported by channel iron braces set in concrete. The incline of the tube is about 30°.

The lower entrance for the double opening escape is the same size as the upper entrance. The increase in diameter from 30 in. to 36 in. is made in the "Y" joint where the lower entrance connects into the main tube.

Escape is secured to the building with brackets, at least one set for every four sections or fraction thereof, exclusive of the entrance, elbow and easement. Entrance on inside of building to be closed with double doors 15 in. wide, 42 in. high, equipped with panic bolt hardware, operated with push bars on each door, door to swing into the entrance of the escape. An all-metal entrance unit—including doors, casing, threshold, etc.—can be furnished at a slight additional cost.

A horizontal swing bar shall be placed near the top of the entrance, just outside the door, for the occupants to grasp with hands when entering the escape. Swing bar to be ¾ in. in diameter.

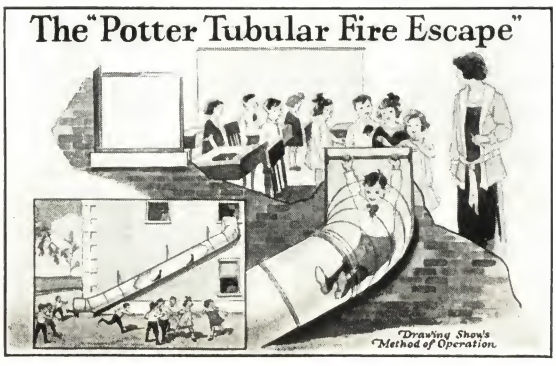
Escapes shall be painted one coat in factory and, when installation has been completed, they shall be painted a second coat.

Hospital Type—Same as for school type, excepting as specified below.

Diameter of tube to be 36 in. Entrance shall be 40 in. wide, 45 in. high at inside wall line of building and flare to 36 in. diameter at the outer extremity. No increase in diameter is made where additional floors are connected into the tube. Elbow shall have a sweep of 40 in.

The easement, or lower end, breaks from 38° angle to horizontal and is about 9 ft. long. The easement rests on a concrete base about 4 in. high. The incline of the tube is about 38° to horizontal.

Complete detailed specifications on request.



DUVINAGE SPIRAL STAIR CO.

89 West Lee Street, HAGERSTOWN, MD.

DUVINAGE SPIRAL STAIRS

Duvinage Riser Design Spiral Stair

Duvinage Riser Design Spiral Stair is shown below at the left. Treads and platforms have open risers and are made of cast iron, mounted on a center column of steel pipe and held in position by carriage bolts. Safety is permanently assured by the scientifically constructed raised diamond tread surface, and maximum strength and wearing quality are provided by a special analysis metal. Treads are made either right or left-hand (left-hand shown), 12 to the circle in 42″ to 96″ diameter stairs, and 16 to the circle in 48″ to 96″ diameter stairs. Platforms are made square, quarter circular, 60° and 90° triangular, with their respective dimensions given in the specification table below. The well opening should be 2″ larger than the diameter of the stair to provide sufficient clearance and to allow the use of a standard size platform. Winged hub and bottom flange are of cast iron. The winged hub is attached to rolled diamond steel plate when a larger or irregularly shaped platform is necessary; the bottom flange serves to hold the stair in place at the base. The landing platform is attached to the well opening construction with expansion bolts, and no additional bracing is necessary unless the stair is unusually high, in which case intermediate bracing is required and supplied to meet existing conditions. Railing construction consists of 1″ inside diameter steel pipe, single on the stair and double around the well opening, one upright to each tread. An adjustable angle fitting is inserted in the top of the upright and attached to the underside of the handrail with flat head machine screws. An oval flange is attached to the bottom of the upright and bolted to the tread. Railing height is 37″ from the tread surface to the center of the handrail. Riser height and number of treads to the circle are affected by the height between floors. To provide sufficient headroom under the platform, the riser height should not be less than 8½″ on a stair of 12 treads to the circle and a platform of not more than 90°. When a stair of 16 treads to the circle is required, a riser height as low as 7″ may be used, as well as a special platform of more than 90°.

By calculating the number of risers required, 12 or 16 treads to the circle, the relative positions of starting and landing can be determined, and a right or left-hand stair decided upon.

Duvinage Cantilever Design Spiral Stair

Duvinage Cantilever Design Spiral Stair is shown below at the right. The treads are correctly designed upon the cantilever principle, and so constructed that they may be used either right or left-hand (right-hand shown), 12 to the circle in 42″ to 60″ diameter stairs and 16 to the circle in 48″ to 60″ diameter stairs. Duvinage Cantilever Spiral Stairs are manufactured only in diameters of 42″ to 60″ according to the table below. Otherwise the construction of this stair is the same as our Riser Design, excepting there is only one upright to every third tread in the railing construction, single railing around the well opening, and the treads are held in position by set screws in the hub. Platforms are the same as those used in our Riser Design stair.

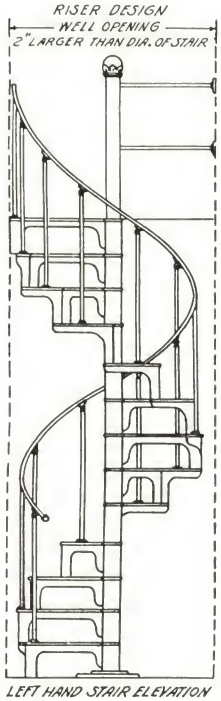
For Special Construction

Deviations from standard specifications of the Riser Design stair to meet the user's requirements may be made at proportionate increase in cost. Larger or irregularly shaped platforms of cast iron or steel plate not listed in the specification of stair table may be furnished when necessary.

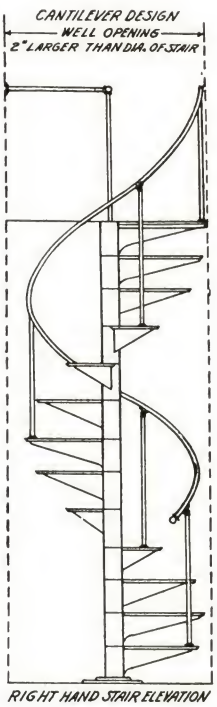
Abrasive treads and platforms may also be furnished. Treads and platforms may be recessed for composition flooring. Risers may be closed by steel inserts, or treads and platforms may be cast with solid risers. Single or double railing of larger diameter may be supplied; also square bar or round iron uprights with handrail of brass pipe, wrought iron, architectural brass or rolled steel.

Information for Requesting Estimates and Ordering

State exact diameter and height of stair from finished floor to floor levels. Sketch starting and landing positions desired, showing relative walls or partitions if near stair, illustrate well opening and give accurate measurements for platform and railing construction around well opening. Also state deviations from standard construction, if any.



LEFT HAND STAIR ELEVATION



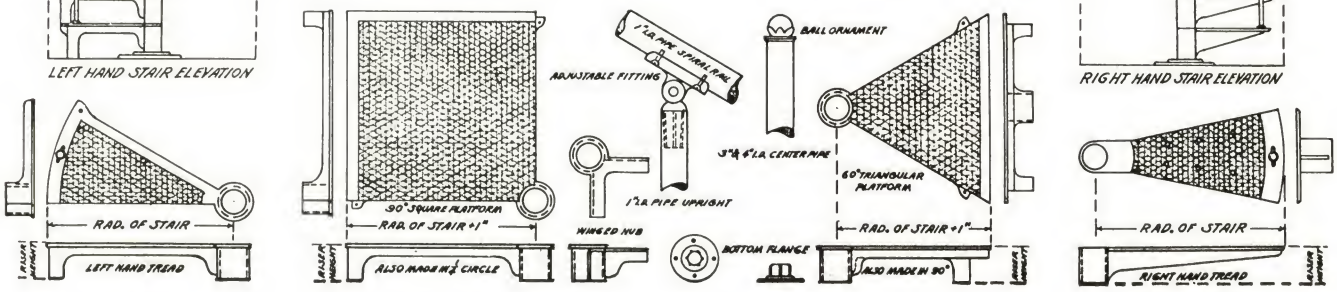
RIGHT HAND STAIR ELEVATION

Specifications

For convenience, the following specifications may be copied bodily: Furnish and erect where shown on plans, Duvinage Spiral Stairs, as manufactured by the Duvinage Spiral Stair Co., West Lee Street, Hagerstown, Md., (....) spiral stairs (....) in. in diameter, (....) ft. high, of cast iron raised diamond surface treads; steel center pipe 3″ inside diameter for 42″ and 48″ diameter stairs, or 4″ inside diameter for 54″, 60″, 66″, 72″, 84″ and 96″ diameter stairs; handrail and uprights of 1″ inside diameter steel pipe, single on stair and double around well opening, one upright to each tread; finished size of floor opening 2″ larger than diameter of stair.

SPECIFICATION OF STAIR TABLE

Dia. of stair, in.	Center pipe, in.	Platform, in.			Floor opening, in.	
		Square	¼ circle	Triangular 60° & 90°	Square	Circular
42	3	22 x 22	22 rad.	22 alt.	44 x 44	44 dia.
48	3	25 x 25	25 rad.	25 alt.	50 x 50	50 dia.
54	4	28 x 28	28 rad.	28 alt.	56 x 56	56 dia.
60	4	31 x 31	31 rad.	31 alt.	62 x 62	62 dia.
66	4	34 x 34	34 rad.	34 alt.	68 x 68	68 dia.
72	4	37 x 37	37 rad.	37 alt.	74 x 74	74 dia.
84	4	43 x 43	43 rad.	43 alt.	86 x 86	86 dia.
96	4	49 x 49	49 rad.	49 alt.	98 x 98	98 dia.



BOIS PATENTED INTERLOCKING STEEL STAIRS

(N. BOIS, PATENTEE, 2848 California Street, SAN FRANCISCO, CAL.)

MANUFACTURED IN THE UNITED STATES, CANADA AND EUROPE BY THE FOLLOWING COMPANIES

New England States
E. VAN NOORDEN & CO.
100 Magazine Street, Boston, Mass.

Georgia, Tennessee, Florida, North and South Carolina
DOWMAN-DOZIER MFG. CO.
Campleton Road, Atlanta, Ga.

Ohio, Michigan and Indiana
THE RIESTER & THESMACHER CO.
1512 West 25th Street, Cleveland, Ohio

Nebraska, Kansas and Western Iowa
PAXTON & VIERLING IRON WORKS,
So. 17th Street and Union Pacific Railway, Omaha, Neb.

Texas
SOUTHERN ORNAMENTAL IRON WORKS,
Dallas, Tex.

Missouri
LASAR MANUFACTURING CO.,
16th and O'Fallon Streets, St. Louis, Mo.

Northern California
PEERLESS ORNAMENTAL IRON CO., INC.,
1528 Folsom Street, San Francisco, Cal.

Southern California, Washington, Oregon, Colorado, New Mexico, Utah, Wyoming, Nevada, Arizona and Hawaiian Islands
A. J. BAYER CO.,
Slauson and Santa Fe Avenues, Los Angeles, Cal.

Alabama, Louisiana, Mississippi and Arkansas
DECATUR IRON & STEEL CO.,
Decatur, Ala.

Kentucky and Virginia
LOGAN CO. (formerly The Dow Co.),
1025 Franklin Street, Louisville, Ky.

British Columbia, Alberta and Saskatchewan
WESTMINSTER IRON WORKS,
New Westminster, B. C.

Great Britain, France and Belgium, FREDK. BRABY & CO., Ltd., Petershill Road, Glasgow, Scotland

Products

Bois Patented Interlocking Steel Treads and Risers.

Also manufacturers of Sheet Steel Stairs.

Advantages

Bois interlocking tread and riser offers distinct advantages of economy, rigidity and rapid erection. The *interlocking* feature eliminates the labor of bolting or riveting, and makes rapid installation possible with unskilled labor.

Bois interlocking tread and riser prevents breaking away the nosing from the composition step under the heaviest traffic. Its superiority and economy in construction can be readily seen.

Interlocking Feature

The interlocking tread and riser combined is formed from a single sheet of steel with flanged member that interlocks at the nosing line. The metal becomes double thick which reinforces the steps.

Labor Saving Installation

A tie rod is inserted under each tread through the stringer. The installation consists only of setting the tread, bolting up the tie rod and inserting two bolts for each tread where the tread meets the flange of stringer, doing away with the bolting or riveting as in ordinary types of stair work, and speeding up the erection.

Varied Standards

The gauge of metal varies with the width of the stairs and weight to be carried. The interlocking treads and risers can be used with any type of stringer, such as sheet steel construction or concrete.

The treads are adaptable to any kind of composition fill, slate, marble, asphalt or concrete, also for any desired safety tread.

Deliveries

When sheet steel stringers are used, the stairs can be assembled at the factory and delivered at the building ready for installation. Each section can be installed as the building progresses, eliminating the use of temporary stairs or ladders, doing away with unnecessary expenses.

If concrete stringers are to be used, the treads and risers are interlocked and put in position from floor to floor, after which the stringers are moulded as usual.

Inquiries

Make all inquiries for estimates to *the manufacturer (list in heading) controlling the territory in which the building is to be erected.* State number of treads and risers, width of stairs, type of stringers, and nature of tread. Include sketch or drawing on which all dimensions and quantities are indicated.

Specifications

All metal stairs throughout the building shall be of the Bois Interlocking Tread and Riser construction type.

Each tread and riser shall be of one continuous piece of No. 12 or No. 14 gauge sheet steel. The tread metal shall be continued up and bent into an inner nosing, around which the outer (wearing) nosing shall be bent and secured by an interlocking, depending flange, reinforcing the step and preventing the nosing from breaking away from the concrete.

The junction of the treads and risers shall be securely fastened to the lower flange of the stringers with $\frac{5}{16}$-in. diameter round machine bolts.

The face and wall stringers shall be of No. 10 gauge sheet steel, with outward top flange and inward bottom flange. Stringers shall be securely tied together with $\frac{7}{16}$-in. diameter tie rods, placed under each tread, near the nosing.

Platforms or landings shall be of No. 14 gauge corrugated steel plates, with interlocking nosing for connection with riser and shall be securely fastened to angle iron supports connected to stringers.

Newels, railings and balustrades to be of design and construction as indicated on plans.

All work to have 1 shop coat of approved paint.

Information and Catalogue

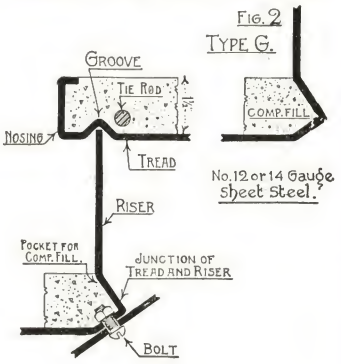
For full information and illustrated catalogues and detail drawings apply to Manufacturer (list in heading) controlling territory in which stairs are to be installed.

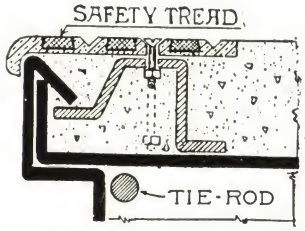
FEATURE OF THE BOIS PATENT INTERLOCKING TREADS AND RISERS FOR STAIR CONSTRUCTION;

It eliminates all bolting and riveting thus saving considerable labor when assembling the stairs. Where the tread interlocks at the nosing the metal becomes double thick, reinforcing the step and preventing the metal breaking away from the concrete.

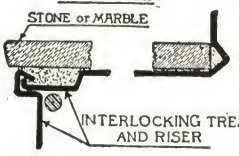
It is the most practical, economical, superior stair construction.

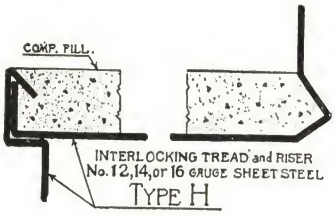
SECTION OF GROOVED FORM TREAD AND RISER

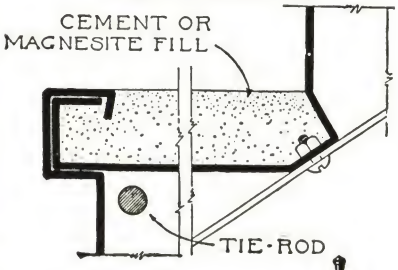


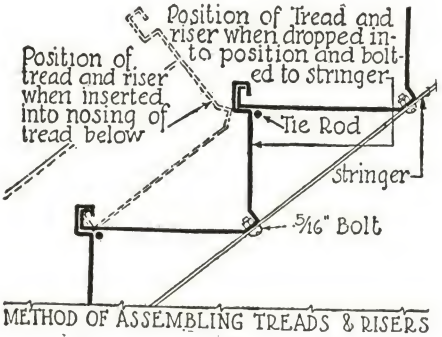


TYPE E

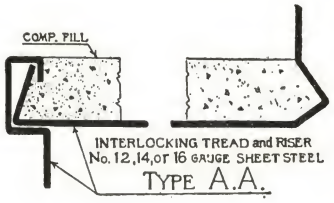


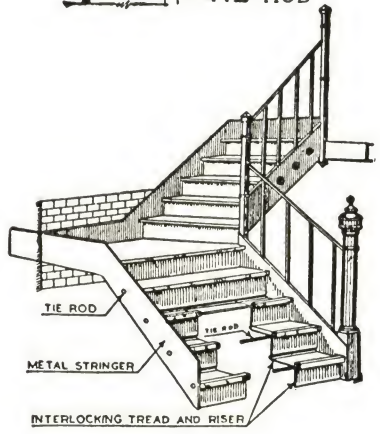


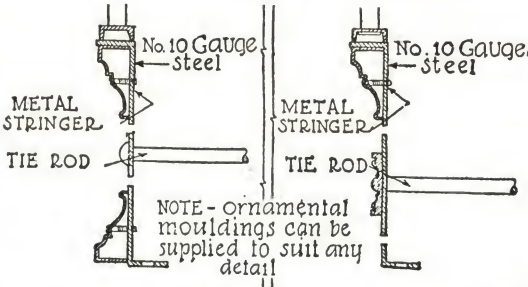




METHOD OF ASSEMBLING TREADS & RISERS







DETAILS OF METAL STRINGERS

APPROXIMATE WEIGHT OF BOIS INTERLOCKING TREADS AND RISERS

WIDTH OF STAIRS	SQ. FT. OF METAL IN ONE INTERLOCKING TR. & RISER.	WEIGHT OF ONE INTERLOCKING TREAD AND RISER		
		NO. 12 GA.	NO. 14 GA.	NO. 16 GA.
2'-0"	4 SQ. feet	18.0 lbs	12.8 lbs.	10.4 lbs.
2'-6"	5 " "	22.5 "	16.0 "	13.0 "
3'-0"	6 " "	27.0 "	19.2 "	15.6 "
3'-6"	7 " "	31.5 "	22.4 "	
4'-0"	8 " "	36.0 "	25.6 "	
4'-6"	9 " "	40.5 "	28.8 "	
5'-0"	10 " "	45.0 "	32.0 "	
5'-6"	11 " "	49.5 "		
6'-0"	12 " "	54 0 "		

TYPICAL SECTIONS SHOWING CONSTRUCTION OF BOIS PATENTED INTERLOCKING TREADS AND RISERS

TEST OF BOIS PATENTED INTERLOCKING SHEET STEEL STAIR MADE BY E. VAN NOORDEN CO., BOSTON, MASS.

December 9, 1924

In order to determine accurately the safe loading for the Bois Interlocking Sheet Steel stair, a test was conducted by Professor H. W. Hayward of the Massachusetts Institute of Technology, Cambridge, Mass. A summary of this test is as follows:

"The full load of 600 pounds per square foot was allowed to remain upon the stairs for two weeks. The load was then removed and after four days the inspection was made.

"The slight distortion in channel header (at top) straightened out when the load was removed. The deflection in the top flange of runner was reduced to a negligible amount upon removal of the load. The general appearance of the stairs was good. No indications of overstrain could be noted either as regards lateral or vertical deflections.

"It should be noted that during the time the load was on the stairs the temperature varied approximately from 0° to 50° F. This variation in temperature would cause additional indeterminate stresses on the stairs."

Full report of test will be sent on request.

CENTRAL WIRE AND IRON WORKS

ESTABLISHED 1907

Manufacturers of "Ever-Ready" Fireproof Stairs

(PATENT PENDING)

309 Gratiot Street
ST. LOUIS, MO.

Products

"Ever-Ready" Steel Stairs.
Also Fire Escapes and Ornamental Iron Work.

Outstanding Features of Our Improved "Ever-Ready" Steel Stairs

(1) Used as an immediate service stair during construction of building.
(2) Attractive, practical and less costly than the old method of construction.
(3) The separate nosing is of much heavier gauge material than generally used for treads and risers.
(4) Easily broom-cleaned before tread filler is applied.
(5) Speed of erection is accelerated.
(6) Minimizes accidents.
(7) Nosing is slid into place in much the same manner that safety treads are now set when applying the filler, and with no greater effort or expense.
(8) Nosings are not damaged as is often the case with nosings fixed on stairs at the factory.
(9) Requires no temporary tread filler of planks or other substances.
(10) Furnished in large sections ready to set in place.
(11) Steel newels, with cast caps and pendants, may be paneled and are more modern than the newels ordinarily used in general stair construction.
(12) Newels in our construction serve only as railing stops.
(13) Stairs are supported on floors and platforms,—not dependent on support by newels.

Specifications

Stairs—Shall be of the "Ever-Ready" type of construction as manufactured by the Central Wire and Iron Works, St. Louis, Mo., and as illustrated in Sweet's Architectural Catalogues, and designed to carry a live load of 125 lbs. per sq. ft., arranged for concrete fill 1¾ in. thick furnished by others.

Stringers—Shall be not less than $\frac{3}{16}$-in. steel plate bent in channel form 10 in. or more in width. Exposed or face strings to have wrought iron mouldings at top and bottom flanges riveted to strings. All exposed rivets on face strings to be countersunk.

Treads and Risers—Of interlocking construction, not less than No. 13 blue annealed steel with separate interlocking nosing of No. 10 gauge with punched lugs 1 in. long, spaced 10 to 12 in. on centers, to engage in corresponding slots punched in treads.

Nosings—To be attached (slid into place) at time of inserting the fill by Contractor for that material. (See details.)

Platforms and Landings—Where required, shall be No. 12 or No. 13 steel supported on angle frames riveted to stringers and reinforced with tees not more than 2 ft. on centers. Where stair walls are not of bearing kind, struts or hangers are to be supplied.

Newels—Of No. 12 blue annealed steel with sunken panels and cast iron caps and pendants as shown.

Railings—To be of design shown on drawings, top channels punched to receive wood hand rails supplied by others.

Painting—The entire stairwork to receive a coat of shop paint, except that part of treads where concrete fill is used.

Estimates

Send plans or sketches and we will gladly furnish preliminary estimates promptly.

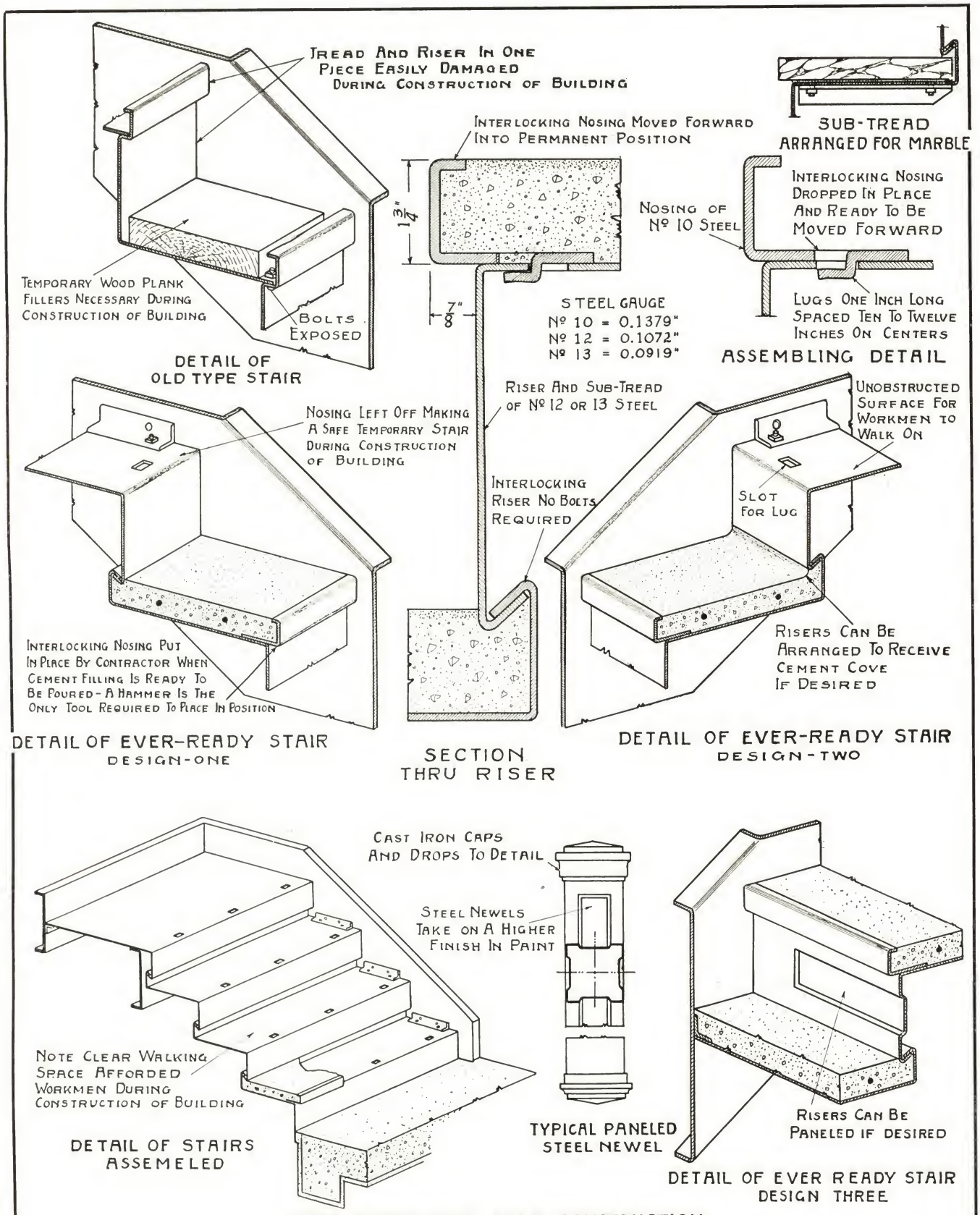
Sample of our interlocking "Ever-Ready" tread and riser construction will be submitted to architects upon request.

Central States Life Insurance Building, St. Louis, Mo.

T. P. Barnett Co., Architects

The main stairs illustrated are of marble on a steel substructure; the wrought iron scroll railing from first floor to top is of uniform height without newels, ramps or braces.

We also furnished the service stairs and all other ornamental iron work in connection with this modern structure.



"EVER-READY" STEEL STAIR CONSTRUCTION

All stairs are erected in our shop before being shipped to avoid errors and assure the minimum cost of erecting at building. Our stairs are shipped in large sections all made up, except where the width exceeds 6 ft., when they are forwarded knock-down. All sections are marked and lettered as on shop drawings furnished for each order.

We will gladly submit preliminary or accurate estimates when favored with the necessary data upon which to base same.

THE HUGHES-KEENAN CO.

Pressed Steel Stairs and Spiral Steel Stairs

MANSFIELD, OHIO

Products

SAFETY-LOCK and SAFETY-NOSE INSERT PRESSED STEEL STAIRS; SPIRAL STEEL STAIRS.

Design

Steel stairs are built to any design and meet all architect's requirements as well as all requirements of State and city building codes. Safety-Lock and Safety-Nose Insert Pressed Steel Stairs are special designs of THE HUGHES-KEENAN CO. and are covered by patents allowed and applied for. Each type is unusually sturdy and rigid and the finished assembly is decidedly compact and appealingly neat. Safety-Nose Insert Pressed Steel Stairs provide a safety nosing at edge of tread where most needed and one which is easily installed or renewed when worn.

Spiral Steel Stairs

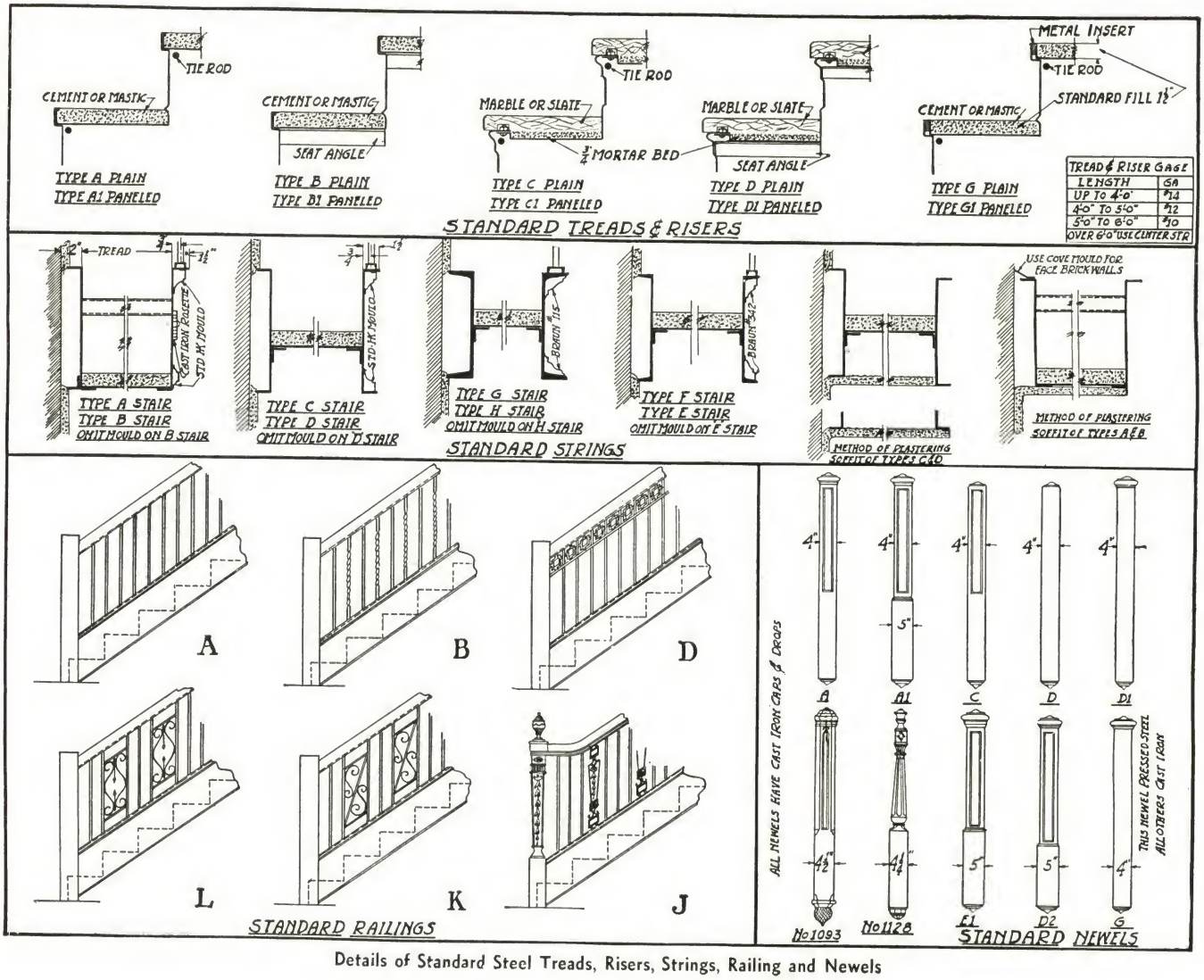
These are very light and simple in design but unusually neat and attractive in appearance. They will carry equally as much live load as cast iron and with much lighter construction. They are furnished with checkered steel plate treads and plain steel plate risers of open or closed type. Very easy to erect.

Standard Construction Details

Below are shown a few standard construction details of treads and risers, stringers, standard stair railings and newels. Type G and H strings are heavy structural channels. F and E strings are light structural channels and others are pressed steel of gauge to suit span. Furnished with or without tread and riser angles. Railings and newels are only a few of the standard designs and these can be furnished in any type desired by the architect. Standard construction detail drawings to large scale are furnished to architects upon application.

Installation, Information and Estimates

Experienced erectors are furnished when desired. Stairs, except spiral stairs, can be shipped in completely assembled units for installation at low cost. Information and estimates supplied promptly upon request.



Details of Standard Steel Treads, Risers, Strings, Railing and Newels

FOUNDED 1850

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS

Jones & Laughlin Building, PITTSBURGH, PA.

For District Sales Offices and Warehouses, see pages on Tubular Products

Products

J & L LIGHT WEIGHT CHANNELS for Stair Stringers and other uses.

For J & L Bars for Concrete Reinforcement, Junior Beams and Tubular Products, see Manufacturers' Index.

Description of J & L Light Weight Channels

J & L Light Weight Channels are produced on modern rolling mills and are similar in type to standard channel sections. They have constant dimensions, making fabricating and fitting to other work economical.

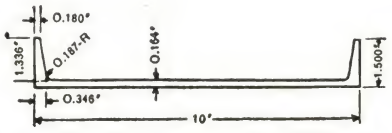
Due to the rolled shape, the material is ready, as received, for fabrication into various uses, including stair stringers, thereby saving time. The rolled shape also reduces to the minimum shop equipment for fabrication. J & L Light Weight Channels are economical in weight and form a strong structure. The lines are straight and true, resulting in proper fitting at the joints, thus making a well-finished installation.

These sections are now available in two sizes and three weights as follows: 10 in. 8.0 lb. per ft., 10 in. 8.8 lb. per ft. and 12 in. 10.6 lb. per ft.

Shipments will be made direct from our mills in Pittsburgh, or from J & L Warehouses in Chicago, Cincinnati, Detroit, New Orleans and Pittsburgh, where all these sections are available for immediate shipment.

On mill orders, lengths available for immediate shipment are: 20, 25, 30, 40 and 50 ft. Channels will also be furnished cut to length. Lengths available on warehouse orders, 3 to 50 ft.

Typical Installation



Dimensions above are for C-751
See table below for C-750 and C-700

DIMENSIONS

Section index	Depth of channel, in.	Wt. per ft., lb.	Flange width: In. and decimal parts	Flange width: In. and fractional parts	Web thickness: Decimal parts of in.	Web thickness: Fractional parts of in.
C-750	10	8.8	1.523	1 33/64	0.187	3/16
C-751	10	8.0	1.5	1 1/2	0.164	11/64
C-700	12	10.6	1.5	1 1/2	0.19	3/16

PROPERTIES OF SECTION

Area sq. in.	Axis X-X (perpendicular to web): I	r	S	Axis Y-Y (parallel to web): I′	r′	S′	n′
2.57	32.3	3.54	6.4	0.35	0.37	0.28	0.28
2.34	30.3	3.60	6.1	0.33	0.38	0.27	0.29
3.12	55.8	4.23	9.3	0.39	0.35	0.32	0.27

ALLOWABLE LOADS

	Index No.	Depth of channel, in.	Wt. per ft., lb.	Bend mom., ft. lb.	Max. load	Span, feet: 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Fiber Stress, 18,000 Lb. per Sq. In.																														
Total load in thousands of pounds	C-750	10	8.8	9660	44.9	38.6	25.8	19.3	15.5	12.9	11.0	9 7	8.6	7.7	7.0	6.4	5.9	5.5	5.2	4.8	4.5	4.3	4.1	3.9	3.7	3.5	3.4	3.2	3.1	3.0
	C-751	10	8.0	9090	39 4	36.4	24.2	18.2	14.5	12.1	10.4	9.1	8.1	7.3	6.6	6.1	5.6	5.2	4.8	4.5	4.3	4.0	3.8	3.6	3.5	3.3	3.2	3.0	2.9	2.8
Total deflection, in.						.007	.017	.030	.047	.067	.091	.119	.151	.186	.225	.268	.315	.365	.419	.477	.538	.603	.672	.745	.821	.901	.985	1.073	1.164	1.259
Total load in thousands of pounds	C-700	12	10.6	13947	54.7		37.2	27.9	22.3	18.6	15.9	13.9	12.4	11.2	10.1	9.3	8.6	8.0	7.4	7.0	6.6	6.2	5.9	5.6	5.3	5.1	4.9	4.6	4.5	4.3
Total deflection, in.						.006	.014	.025	.039	.056	.076	.099	.126	.155	.188	.223	.262	.304	.349	.397	.449	.503	.560	.621	.684	.751	.821	.894	.970	1.05
Load in lb. per lin. ft. of channel	C-750	10	8.8			19320	8587	4830	3091	2147	1577	1208	954	773	639	537	457	394	343	302	267	239	214	193	175	160	146	134	124	114
	C-751	10	8 0			18180	8080	4545	2909	2020	1484	1136	898	727	601	505	430	371	323	284	252	224	201	182	165	150	137	126	116	108
	C-700	12	10.6				12398	6974	4463	3100	2277	1743	1378	1116	922	775	660	569	496	436	386	344	309	279	253	231	211	194	179	165
Fiber Stress, 16,000 Lb. per Sq. In.																														
Total load in thousands of pounds	C-750	10	8.8	8587	37.5	34.3	22.9	17.2	13.7	11.4	9.8	8.6	7.6	6.9	6.2	5.7	5.3	4.9	4.6	4.3	4.0	3.8	3.6	3.4	3.3	3.1	3.0	2.9	2.7	2.6
	C-751	10	8.0	8080	32.8	32.3	21.5	16.2	12.9	10.8	9.2	8.1	7.2	6.5	5.9	5.4	5.0	4.6	4.3	4.0	3.8	3.6	3.4	3.2	3.1	2.9	2.8	2.7	2.6	2.5
Total deflection, in.						.007	.015	.026	.041	.060	.081	.106	.134	.165	.200	.238	.280	.324	.372	.424	.478	.536	.597	.662	.730	.801	.875	.953	1.034	1.119
Total load in thousands of pounds	C-700	12	10.6	12398	45.6		33.1	24.8	19.8	16.5	14.2	12.4	11.0	9.9	9.0	8.3	7.6	7.1	6.6	6.2	5.8	5.5	5.2	5.0	4.7	4.5	4.3	4.1	4.0	3.8
Total deflection, in.						.006	.012	.022	.034	.050	.068	.088	.112	.138	.167	.199	.233	.270	.310	.353	.399	.447	.498	.552	.608	.667	.729	.794	.862	.932
Load in lb. per lin. ft. of channel	C-750	10	8.8			17173	7633	4293	2748	1908	1402	1073	848	687	568	477	406	350	305	268	238	212	190	172	156	142	130	119	110	102
	C-751	10	8.0			16160	7182	4040	2586	1796	1319	1010	798	646	534	449	382	330	287	253	224	200	179	162	147	134	122	112	103	96
	C-700	12	10.6				11020	6199	3967	2755	2024	1550	1224	992	820	689	587	506	441	387	343	306	275	248	225	205	187	172	159	147

Note: Loads above lines at left will produce maximum allowable shear in webs; loads above lines at right will produce excessive deflections.

THE McNEILL ORNAMENTAL IRON & CONSTRUCTION CO.

Manufacturers of Spiral Stairs

460 East Cross Street, BALTIMORE, MD.

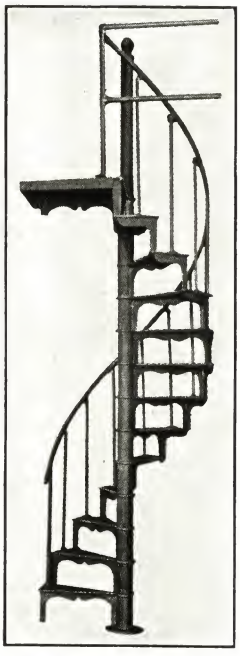
McNeill Spiral Stairs

These stairs are easily assembled on the job, are inexpensive and their neat appearance makes them ideal for use in factories, power plants, office buildings, stores, schools, churches, warehouses, armories and many other places where the saving of floor space is essential.

Construction—McNeill standard construction consists of 3 or 4-in. center pipe, cast iron treads with 1-in. pipe hand rail and ¾-in. pipe uprights, one to a tread. Note our *adjustable fitting* on balusters leaving hand rail smooth, also the ornamental design of risers in center illustration.

Safety Features—Our treads have diamond surface raised above border which adds greatly to their non-slip value. Carborundum surface treads and platform at slight additional cost.

Special Design Railings—Can be furnished at an additional cost.

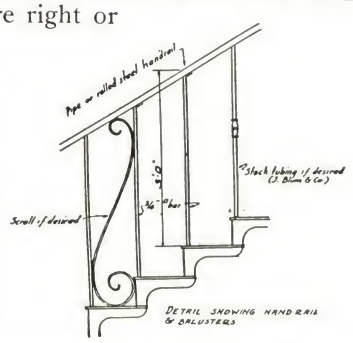


McNEILL SPIRAL STAIRS

Diam. of stair, in.	Center pipe, in.	Treads to circle	Platform, size of square or radius, in.	Openings, size of square or diameter, in.
42	3	12	22	44
48	3	12-16	25	50
54	4	12-16	28	56
60	4	12-16	31	62
66	4	12-16	34	68
72	4	12-16	37	74
84	4	12-16	43	86

Directions for Ordering—Give height from floor to floor. State kind of floor and if center pipe rests on floor or distance below floor and whether stairs are right or left hand.

(The illustration in the center is a left-hand stairs, the diagram below shows right hand.)

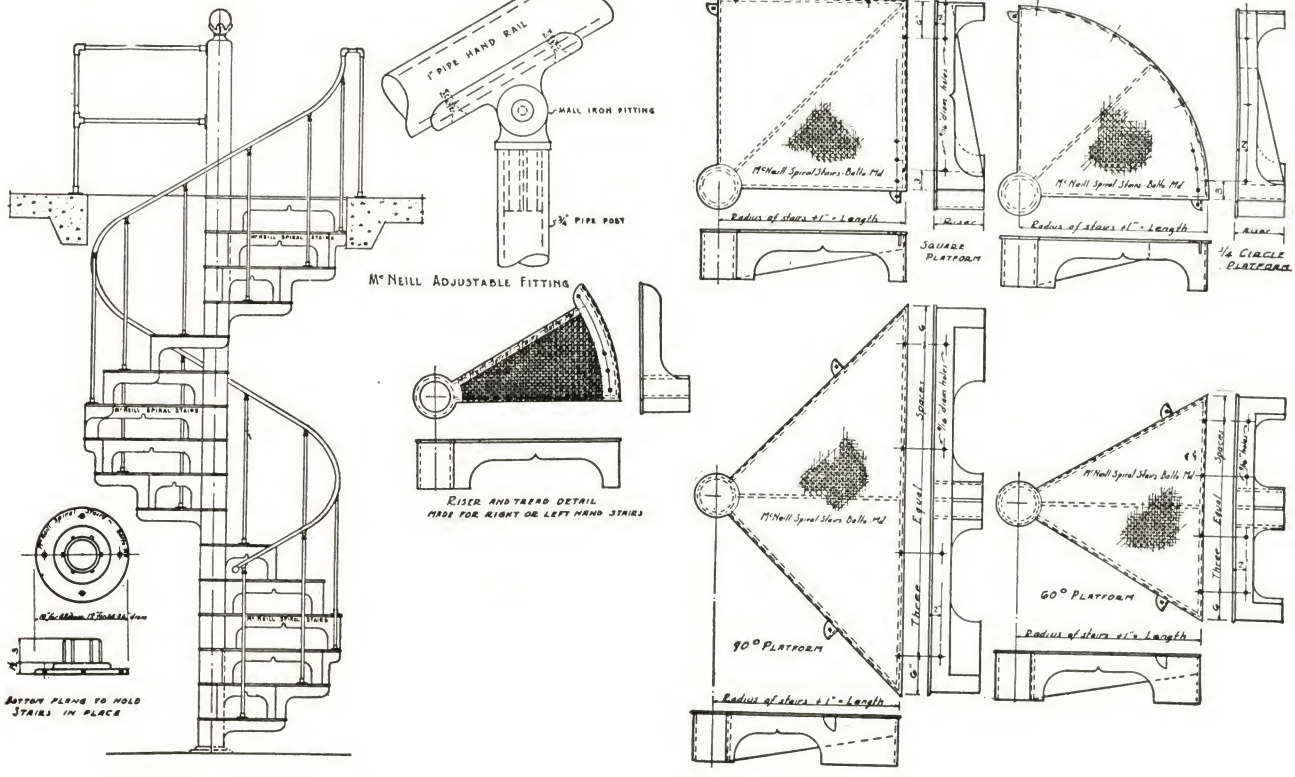


To allow clearance for hand rail, the opening in the floor at top of stairs should be 2 ins. larger than the stairs' diameter.

To allow sufficient headroom the risers should be from 8 (not less) to 9 ins. each and 12 or 16 treads to a turn. The starting and landing points are then determined and whether a right or left-hand stairs best suits.

Architects' Specifications

Spiral Stairs—Furnish and erect where shown on plans, spiral stairs . . . . diameter, as manufactured by THE McNEILL ORNAMENTAL IRON & CONSTRUCTION CO., Baltimore, Md., of cast iron treads with diamond surface raised above borders at least ⅛ in., and hand rail of 1-in. pipe on stairs and around well opening.



THE ORNAMENTAL IRON WORK COMPANY

Stairs of Every Description and of Any Construction for Every Purpose

929 Sweitzer Avenue

AKRON, OHIO

AGENTS IN THE FOLLOWING CITIES

CLEVELAND, OHIO — LIMA, OHIO — WARREN, OHIO — CHARLESTON, W. VA. — LOUISVILLE, KY.
CINCINNATI, OHIO — PORTSMOUTH, OHIO — YOUNGSTOWN, OHIO — WHEELING, W. VA. — DES MOINES, IA.
DAYTON, OHIO — ERIE, PA. — HUNTINGTON, W. VA.

25 Years of Stair Making Experience

THE ORNAMENTAL IRON WORK COMPANY *has been making steel stairs and fabricating ornamental and miscellaneous iron, brass, bronze and aluminum work for more than 25 years.*

During this quarter century, practically every type and construction of stairs for practically every purpose has been produced by this organization, and many new and important contributions have been made to the stair building art.

Service to the Architect

A modern, thoroughly equipped plant and an experienced designing department are at the service of architects. Typical stair details, estimates and suggestions will be gladly furnished on request.

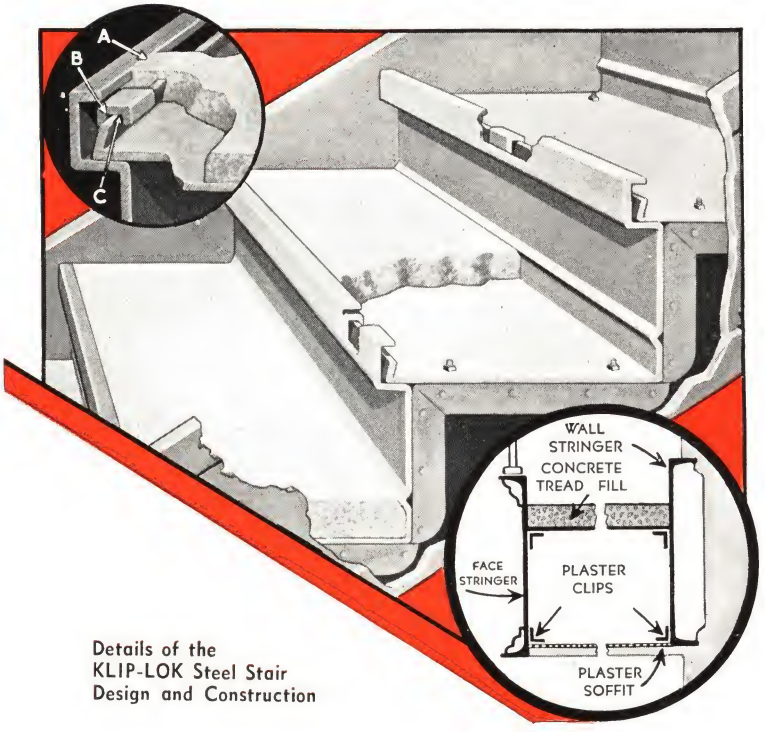
KLIP-LOK STEEL STAIRS

A New and Improved Design

KLIP-LOK
IT LOCKS
Pat. Applied for

KLIP-LOK marks an important forward step in steel stair design and construction. This new and improved design provides an interlocking feature at the stair nosing which holds the nosing rigid and prevents it from separating, under the stress of heavy traffic, from the tread fill at joint "A" (see accompanying illustration). This prevents the crumbling and rapid wearing away of the tread fill, which a separation of even as little as 1/16-in. may cause.

KLIP-LOK nosings are reinforced by the upturned flange of the tread. This flange engages with the new style Klip (B) as indicated at "C". By this construction, nosing failure is reduced to a practical impossibility, a point of vital interest to the architect when specifying steel stairs.



Details of the KLIP-LOK Steel Stair Design and Construction

KLIP-LOK construction combines strength with beauty. Both front and underside surfaces of KLIP-LOK stairs are finished off smoothly and are free from unsightly bolt heads, 45° nosings and other objectionable construction features. While the undersurface of KLIP-LOK stairs is of such attractive appearance, that plastered soffits are not mandatory, there are often circumstances where an open soffit does not blend with the finished architecture of the surroundings.

In such cases, KLIP-LOK stringer sections enable the architect to produce a sharply finished plaster line with no danger of cracking. By the ingenious arrangement of the wall stringer and metal clips (see illustration in lower circle) it is also possible to conceal the bottom flange of the wall stringer.

IMPORTANT ADVANTAGES OF KLIP-LOK STAIRS

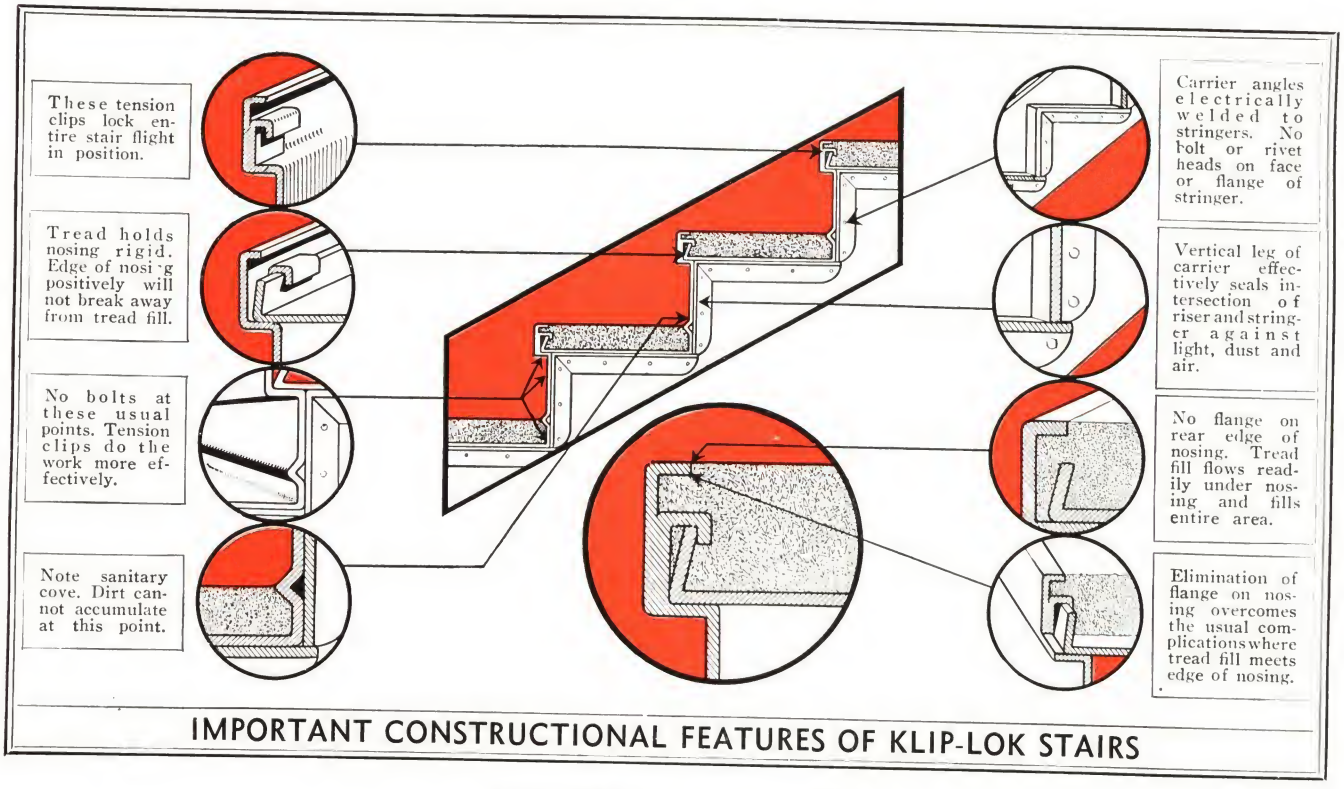
KLIP-LOK steel stairs are easily disassembled, have few parts, are economical to build and erect, easy to ship, all treads are interchangeable and the mastic or other fill is easily applied due to the absence of obstructing flanges on nosing. In addition, they possess the four following features which are of major importance in steel stair design and construction:

(1)—Simpler Design—Three of the new style "Klips" are used to replace seven stove bolts and twice that number of holes for each tread and riser. Shop and erecting costs are both reduced, particularly the latter. Possibility of errors arising in field work is greatly reduced.

(2)—Stronger Construction—Tread utilized to support the nosing—tests made at University of Akron demonstrate the amazing strength of this new tread and riser section. KLIP-LOK stairs can never rattle because the tread is locked into the nosing.

(3)—Safer in Use—Reinforced nose cannot bend and open up seam where fill meets rear edge of nosing. This eliminates a common trouble in steel stair construction.

(4)—Smarter in Appearance—The complete elimination of bolt heads, 45° nosings, and other structural blemishes produces a clean, smart looking stair. The use of vertical as well as horizontal carrier angles also prevents light from showing through the junction of riser and stringer, at the same time effecting a remarkable increase in the carrying power of the tread and riser section.



IMPORTANT CONSTRUCTIONAL FEATURES OF KLIP-LOK STAIRS

KLIP-LOK Stair Specifications

All these stairs throughout shall be KLIP-LOK tread and riser type construction as manufactured by THE ORNAMENTAL IRON WORK COMPANY of Akron, Ohio, or approved equal.

Stringers—Shall be J. & L. light weight channels. Face stringer to be neatly finished with moulding as shown. Where stringer connects to newel, moulding shall be neatly returned to form a paneled effect. Stringer connections must be concealed; no exposed angle or lug connections will be permitted. Carriage angles shall be electrically spot-welded to stringers; no rivets or bolt holes to show on face of string.

Treads and Risers—Shall be one continuous piece of blue annealed sheet steel 14, 13, 12 or 10-gauge, depending on carrying and span requirements, and shall be formed into shape to provide sanitary cove and conform to KLIP-LOK features. Risers must be tight against vertical carriage angles for tight seal.

Nosing—Shall be constructed to contain inner nosing or KLIP-LOK feature, which prevents nosing breaking away from fill, locking riser into position.

Platform and Landings—Shall have wall stringer around entire platform, and angle or tee iron reinforcing; sheets shall be same gauge as tread. KLIP-LOK feature shall be used where edge of platform engages with down riser.

Newels—Shall be 4 x 4-in. pressed steel of one continuous piece of 3/16-in. steel plate, with one electrically welded joint; no corner welds permitted. All corners shall be even, true radius, caps and drops for newels to be of neat design, cast iron or pressed steel.

Balustrades—Shall be of ½-in. square bars, 4-in. on centers, electrically welded into top and bottom channel, to form rigid one-piece construction. No hand riveting, tenoning or other fastening acceptable.

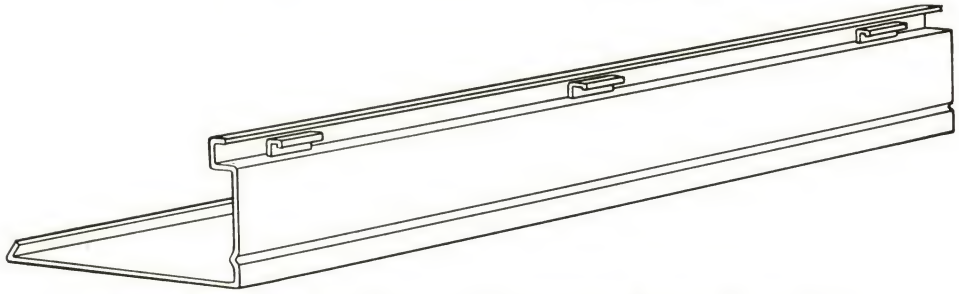
Plaster Clips—Shall be attached to stringers, one at each tread. Lower flange of wall stringer shall be completely concealed from view.

Erection—All stairs must be installed, and necessary equipment provided to carry on work promptly and in first class workmanlike manner to the satisfaction of the architect.

General Conditions—Shop details shall be furnished architect through the contractor. Malleable iron wall rail brackets shall be spaced 5 ft. on centers and securely fastened to the wall. Pipe railings shall be 1½-in. standard black pipe with standard fittings. All stairs to be painted one shop coat of paint. Contractor must guarantee stairs against material defect for one year and to carry a load of not less than 125 lbs. per sq. ft. with safety factor of 4 at all times.

USEFUL STAIR DATA

KLIP-LOK ONE-PIECE TREAD AND RISER



Note How Fastening Device Is Concealed Within the Nosing

RECOMMENDED GAUGES FOR VARIOUS WIDTH TREADS AND RISERS

Width of Stairs	Gauge No.	Width of Stairs	Gauge No.
3—0	14	6—0	10
4—0	13	7—0	10
5—0	12	8—0	10

Note: Stairs over 8 ft. wide should have a center stringer.

TREAD MATERIALS SUITABLE FOR USE WITH KLIP-LOK STEEL STAIRS TOGETHER WITH APPROXIMATE COSTS APPLIED

Cement .....$0.20 per square foot of tread or platform	Rubber tile ....$1.00 per square foot of tread or platform
Mastic ..... .45 per square foot of tread or platform	Art marble, plain 2.25 per square foot of tread or platform
Terrazzo ..... .65 per square foot of tread or platform	Art marble, abrasive ..... 2.60 per square foot of tread or platform
Ceramic tile .... 1.00 per square foot of tread or platform	Domestic marble. 2.25 per square foot of tread or platform
Abrasive rubber fabric ..... 1.00 per square foot of tread or platform	Domestic marble. 2.00 per square foot of riser

Note: Stair conditions will determine cost of stringers if they are also to be of marble.

APPROXIMATE COSTS OF KLIP-LOK STEEL STAIRS

This table is furnished for the architect's use in estimating the cost of steel stairs for new building construction, additional floors, alterations, etc.

Treads 3 ft. wide—no platform or balustrade..$5.25 per riser	Treads 6 ft. wide—no platform or balustrade..$6.75 per riser
Treads 4 ft. wide—no platform or balustrade.. 5.75 per riser	Platforms—add $2.50 per square foot of platform
Treads 5 ft. wide—no platform or balustrade.. 6.25 per riser	Balustrade—(plain)—add $4.50 per lineal foot of balustrade

Note: These prices, while only approximate, are designed to cover all ordinary costs, such as stringers, newels, supporting members and erection; also field painting, cement fill and wood handrail, which are furnished by others. Items not provided for are—special layouts requiring winder treads, safety nosings, wall handrails, etc. For exact quotations on any job, address inquiries to the factory at Akron, Ohio.

OTHER PRODUCTS

In addition to KLIP-LOK steel stairs, THE ORNAMENTAL IRON WORK COMPANY specializes in handling the entire ornamental and miscellaneous iron contracts for the larger type buildings, including in their contracts the use of bronze, aluminum, nickel, and the various alloys now being used in the production of architectural metal. Inquiries should be addressed to the factory at Akron, Ohio.

SOME REPRESENTATIVE RECENT INSTALLATIONS

INSTALLATION	ARCHITECT	CONTRACTOR
M. O'Neil Department Store, Akron, Ohio	Graham, Anderson, Probst & White	Carmichael Construction Co.
Mayflower Hotel, Akron, Ohio	Graham, Anderson, Probst & White	Carmichael Construction Co.
Ford Assembly Plant, Buffalo, N. Y.	Albert Kahn	Hunkin-Conkey Construction Co.
Sparks-Withington Building, Jackson, Mich.	Lockwood-Greene Co.	Boldt Construction Co.
Courthouse, Erie, Pa.	Walter Monahan	Henry Shenk
State Armory, Syracuse, N. Y.	New York State Architect	W. F. Hendrick Co.
Training School for Boys, Warwick, N. Y.	New York State Architect	Boyajohn & Barr
Public High School, Algona, Iowa	Proudfoot, Rawson, Souers & Thomas	J. H. Mayer & Son
A. Polsky Department Store, Akron, Ohio	Starrett & Van Vleck	Carmichael Construction Co.
Paramount Theatre, Hamilton, Ohio	C. W. & Geo. L. Rapp	Midland Building Co.
U. S. Post Office, Watertown, N. Y.	Supervising Architect	Fred R. Comb Co.
Central Tower Bldg., Akron, Ohio	Walker & Weeks	Carmichael Construction Co.
Public Library, Evansville, Ind.	Walker & Weeks	L. W. Hancock

THE RIESTER & THESMACHER COMPANY

Interlocking Steel Stairs

1514-1526 West 25th Street
CLEVELAND, OHIO

Product

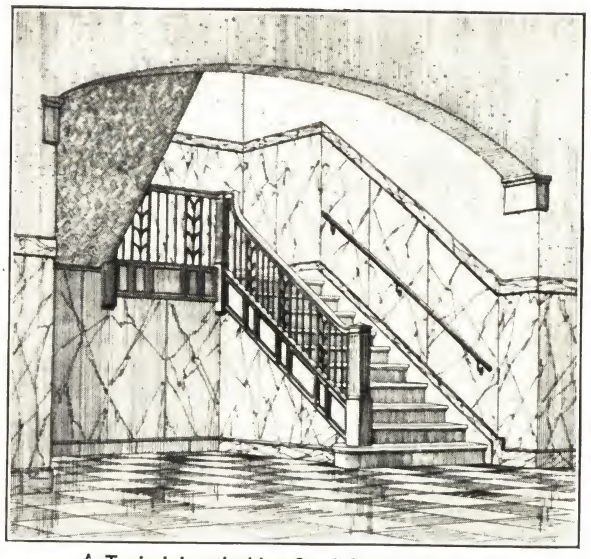
Bois Interlocking Pressed Steel Stairs.
For Hollow Metal Doors and Special Steel Equipment, see Manufacturers' Index.

Service

A modern plant with complete equipment and an efficient organization qualified to give service. Thorough Estimating and Engineering Departments with a background of more than fifteen years in steel stair construction. We are pleased to assist in construction problems and will submit full size details upon application.

Description

The simple interlocking feature of the tread and riser in this stair design offers distinctive advantages in economy, rigidity, strength and rapid erection. It is readily adapted to any desired tread material. The tread and riser is formed from one single sheet of steel with flanges that interlock at the nosing line, producing a reinforced edge that is always straight horizontally. This feature of double strength material with the vertical edge of the nosing keyed into the tread filler prevents the nosing from curling or breaking away from the tread filler. The stringers are assembled with a tie rod running under the angle of each nosing from stringer to stringer. The gauge of metal used is governed by the width of the stair and weight to be carried. Tests of standard Bois stairs have been successfully made carrying a dead weight of 600 lbs. per sq. ft.



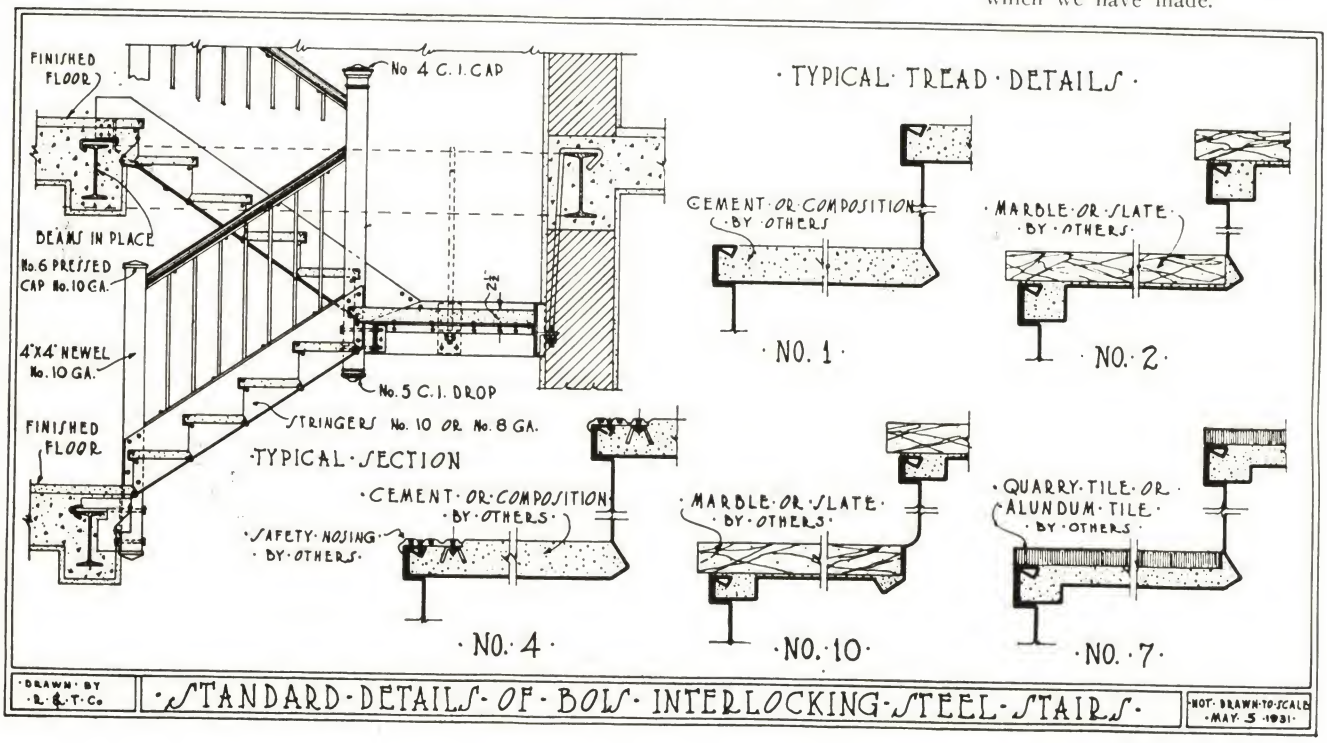
A Typical Interlocking Steel Stairs Installation

Design

This stair meets the requirements of all State and city building codes, and while simple in design is attractive in appearance and can be readily adapted to the requirements of the architect or builder. Construction may be modified or embellished by using ornamental newel posts or caps and drops. The underside of the stair presents a smooth neat appearance which eliminates the use of plaster soffitts.

Installation

The interlocking feature dispenses with all riveting and makes for rapid assembling. Each flight of stairs is assembled in a complete unit in the factory and is economically erected at the building. This also permits of the stairs being erected with the steel framework of the building, giving immediate service before the installation of tread fillers. We will be glad to furnish names of architects who have specified this product or of typical installations which we have made.



THE L. SCHREIBER & SONS CO.

ESTABLISHED 1854

Stairs of Cast or Wrought Iron, Steel or Bronze

Box 18, Evanston Station

CINCINNATI, OHIO

For our page on Ornamental Iron and Bronze, see Manufacturers' Index

Stairs in Cast or Wrought Iron, Steel or Bronze

Design—Stairs of any type in cast or wrought iron, steel or bronze, in either the plain standard type or the highly decorative type.

Construction—All stairs are constructed in accordance with the highest standard of workmanship and are erected in our shops to avoid inaccuracies before being shipped to the building.

Our sketch detail covers many of the questions arising during the layout of the stairs and will be supplemented by other details on request.

Newel posts are without limit as to design, although economy often dictates the use of square steel tubing varying from 2½ in. square to 4 in. square.

Erection—Our erection men are all experienced and are continuously in our employ.

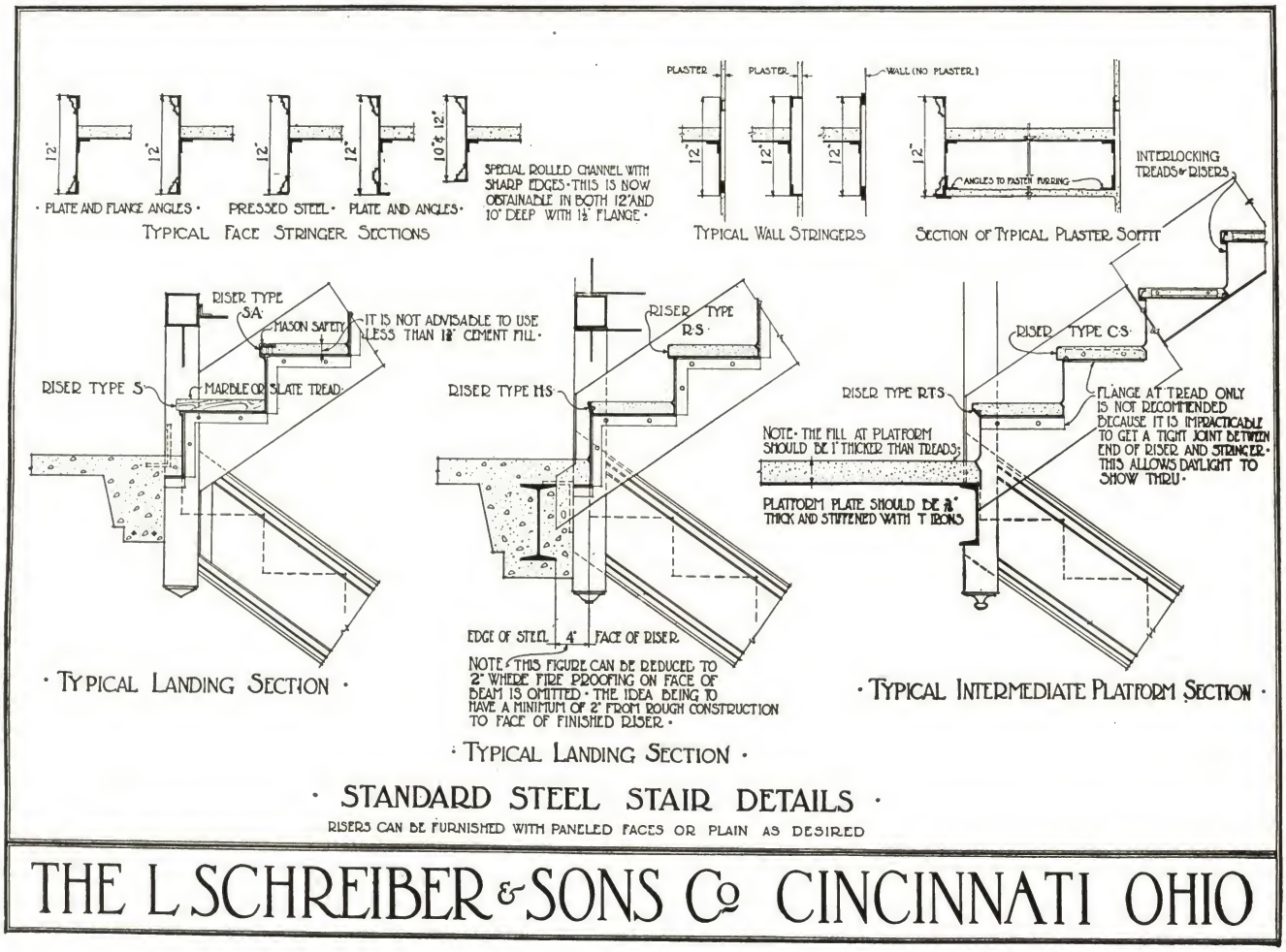
We can send them to erect our work thus keeping it under one head until its completion.

Painting—We give the work one shop coat of preservative paint generally.

We find, however, a growing preference for a protective coat of linseed oil which leaves a good base for the field painting, which we do not undertake.

Service—We are always pleased to furnish estimates and any consultation service at any time.

Our shop organization is thoroughly equipped to make prompt deliveries.



WESTERN ARCHITECTURAL IRON CO.

Steel Stairs and Ornamental Metal Work

TELEPHONE
Independence 1500

3455 Elston Avenue, CHICAGO, ILL.

"Ideal" Steel Stairs

"Ideal" steel stairs are the result of twenty-one years of experience in stair building.

They are fabricated by experts in a modern shop with modern facilities of every description.

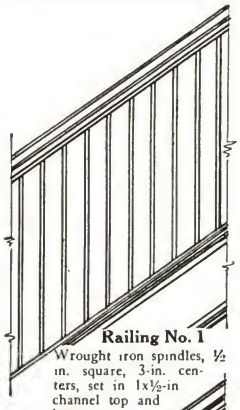
Quality of workmanship in "Ideal" steel stairs is never surpassed and seldom equalled.

Every "Ideal" steel stair is set up complete in the shop before shipment, which insures a perfect fit at the building and results in economy of erection labor.

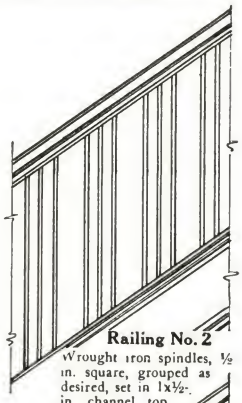
It is for these reasons they are endorsed by prominent architects and builders.

Write to us and we will be pleased to furnish additional information and estimates.

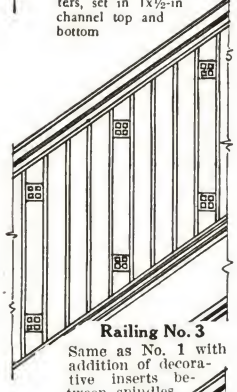
We have only attempted to show a few simple designs of railings and newels most commonly used. We can furnish any special railings and newels desired and have many patterns of elaborate design in stock which can be used when something better is desired without the original high cost of patterns and models.



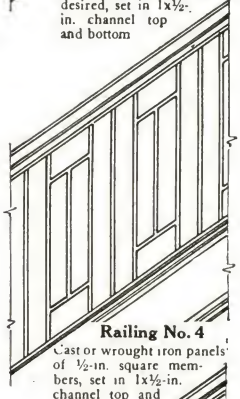
Railing No. 1
Wrought iron spindles, ½ in. square, 3-in. centers, set in 1x½-in channel top and bottom



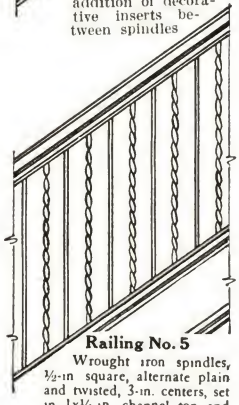
Railing No. 2
Wrought iron spindles, ½ in. square, grouped as desired, set in 1x½-in. channel top and bottom



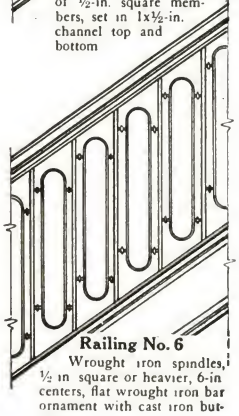
Railing No. 3
Same as No. 1 with addition of decorative inserts between spindles



Railing No. 4
Cast or wrought iron panels of ½-in. square members, set in 1x½-in. channel top and bottom



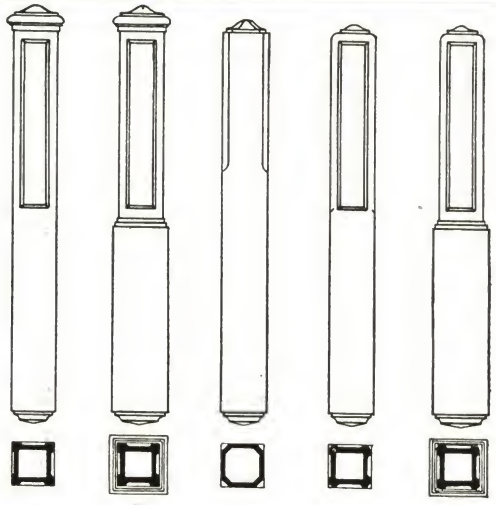
Railing No. 5
Wrought iron spindles, ½-in square, alternate plain and twisted, 3-in. centers, set in 1x½-in channel top and bottom

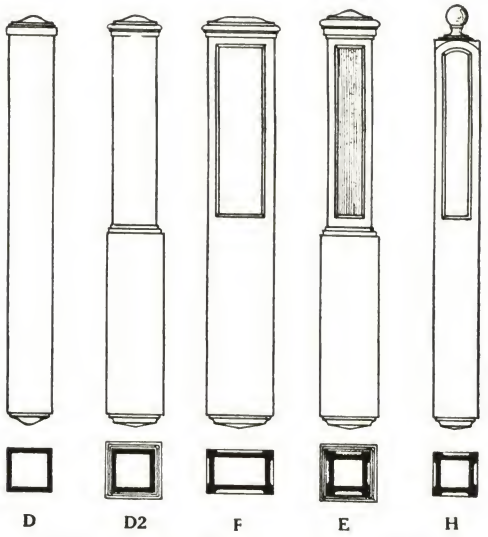


Railing No. 6
Wrought iron spindles, ½ in square or heavier, 6-in centers, flat wrought iron bar ornament with cast iron buttons

Standard Railings

Note. **In all cases handrail can be of wood or metal. Any special railing and newel designs can be furnished.**

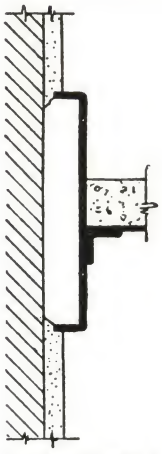




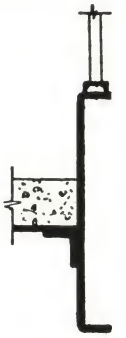
STANDARD NEWELS

Style	Shaft	Style	Shaft
A	3, 4 and 5-in. square	D	3, 4 and 5-in. square
A1	3, 4 and 5-in. square	D2	3, 4 and 5-in. square
B	4 and 5-in. square	F	6x4 in. rectangular
C	4 and 5-in. square	E	4-in. square
C1	4 and 5-in. square	H	4-in. square

DETAILS OF "IDEAL" STEEL STAIRS

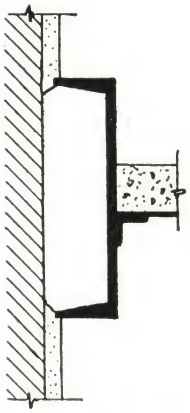


Wall String No. 1
10x1½ channel

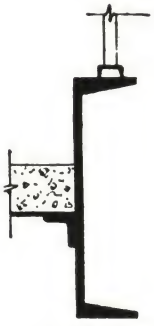


Face String No. 1
10x1½ channel

Face String No. 2
10x1½ channel with moulding

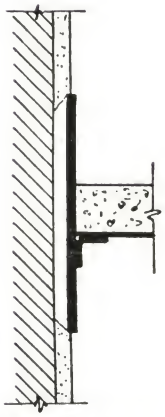


Wall String No. 2
10x15 3-lb channel

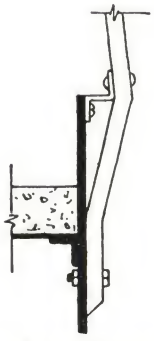


Face String No. 3
10x15.3-lb channel

Face String No. 4
10x15.3-lb. channel with moulding

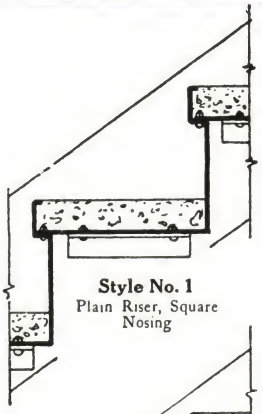


Wall String No. 3
10x¼ plate

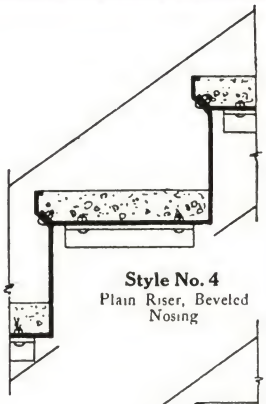


Face String No. 5
10x¼ plate for stair with pipe rail

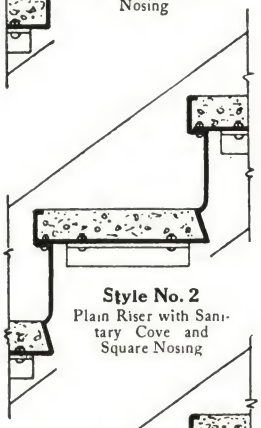
Face String No. 6
10x¼ plate with moulding



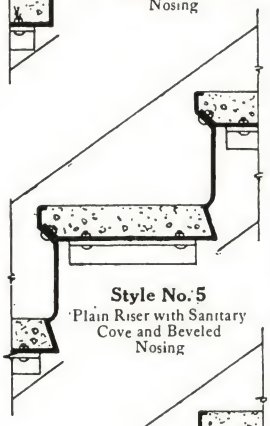
Style No. 1
Plain Riser, Square Nosing



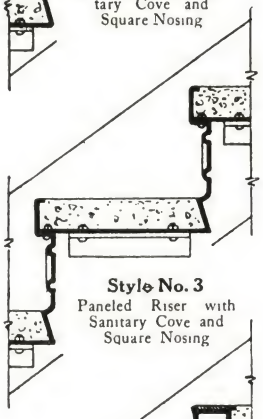
Style No. 4
Plain Riser, Beveled Nosing



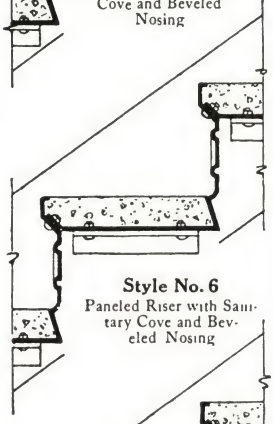
Style No. 2
Plain Riser with Sanitary Cove and Square Nosing



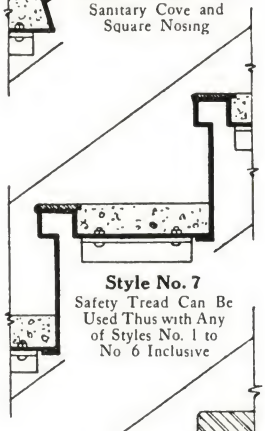
Style No. 5
Plain Riser with Sanitary Cove and Beveled Nosing



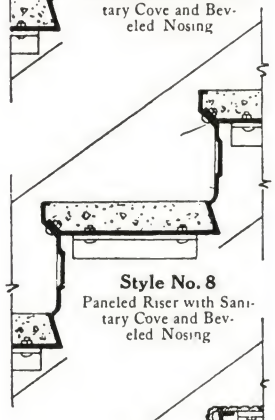
Style No. 3
Paneled Riser with Sanitary Cove and Square Nosing



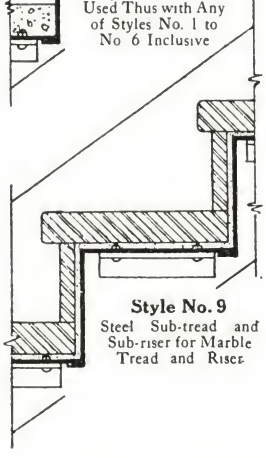
Style No. 6
Paneled Riser with Sanitary Cove and Beveled Nosing



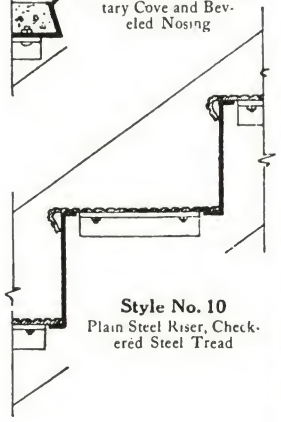
Style No. 7
Safety Tread Can Be Used Thus with Any of Styles No. 1 to No 6 Inclusive



Style No. 8
Paneled Riser with Sanitary Cove and Beveled Nosing



Style No. 9
Steel Sub-tread and Sub-riser for Marble Tread and Riser



Style No. 10
Plain Steel Riser, Checkered Steel Tread

DETAILS OF "IDEAL" STEEL STAIRS

VULCAN RAIL & CONSTRUCTION COMPANY

Manufacturers of Pipe and Bridge Railings

MAIN OFFICE AND WORKS
Grand Street and Garrison Avenue, MASPETH, N. Y.
BRANCH OFFICE AND SHOPS: 39th Street and A. V. R. R., PITTSBURGH, PA.

Products

PIPE RAILINGS, FENCES and SPECIAL CONSTRUCTION for:

- Auditoriums
- Boardwalks
- Bridges
- Elevated Structures
- Grandstands
- Prisons
- Sewage Treatment Works
- Stadia
- Stairs
- Theatres
- Warehouses, etc.

SPECIAL PIPE WORK for:

- Fur Storage Racks
- Platform Shelters
- Table Supports
- Turnstiles, etc.

STAIRS, LADDERS, etc. with RAILING for:

- Coal Breakers
- Subways
- Dams
- Power Plants
- Hydroelectric Plants

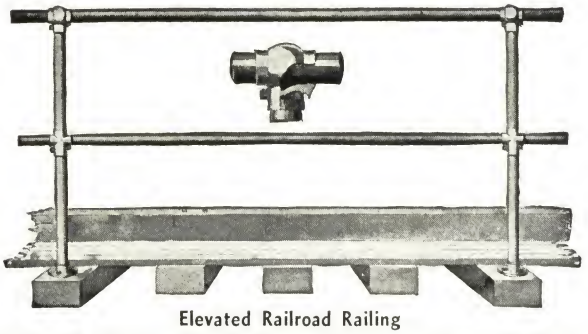
For Vulcan "All-Steel" Fire Doors, see Manufacturers' Index.

TRADE-MARK

Standard Pipe Stair and Wall Rail

Facilities

Our main plant at Maspeth, N. Y., and branch shops at Pittsburgh, Pa., are both fully equipped to manufacture railing products, having a trained force of skilled and experienced workmen, which insures prompt and efficient execution of all orders. Both plants are located on main line railroads and have private sidings.



Elevated Railroad Railing

Constructed with special malleable iron fittings equipped with "Vulcan" Anti-rattler Wedges to prevent loosening of railing due to vibration of structure

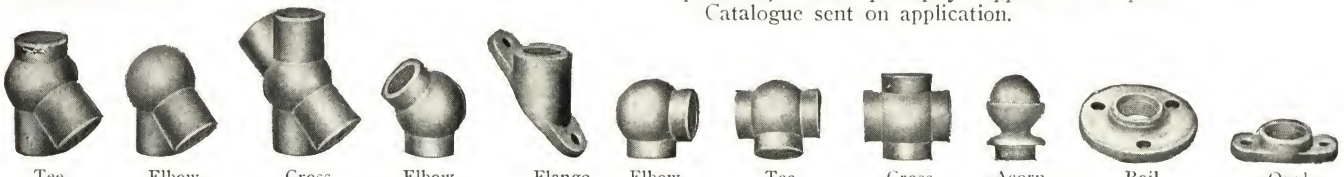
Service

We offer to engineers the service of our Engineering Department to advise with them or aid them in any railing problem or in any other problem involving the use of pipe and fittings in construction work.

Specific Information

Complete information, including estimates and preliminary designs for any of the products illustrated, or listed under products, will be promptly supplied on request.

Catalogue sent on application.



Tee | Elbow (upper) | Cross | Elbow (lower) | Flange | Elbow | Tee | Cross | Acorn male or female | Rail Flange | Oval Flange

"Vulcan" Standard Railing Fittings

Boardwalk Railing with Lamp Posts

Typical Bridge Railing

Vulcan Pipe Railings

First quality pipe with Vulcan Standard Malleable Iron Railing Fittings and Vulcan Standard Cast Iron Flanges are used in the manufacture of all Vulcan Pipe Railings. Due to the great variety of fittings, flanges, etc., which are carried in stock for fabrication, we are able to meet many different construction conditions.

Pipe Rail on Double Concrete Stairs

Vulcan Table Supports

Vulcan Table and Laboratory Supports can be furnished in many designs to meet special requirements. They are all sturdy in construction and are well suited to applications where strength, accuracy and durability are demanded.

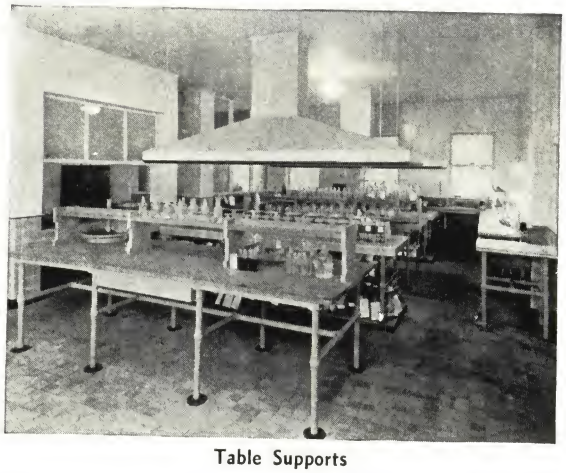


Table Supports

Vulcan Bridge Railings

Vulcan Standard Bridge Railings are constructed of various combinations of pipe, fittings, bars (round and square), flats, channels, angles, etc. As its basic principle, the present day design of bridge railings has pipe for the rails and posts with filling of round or square pickets or other structural shapes. The designs offer simplicity and strength together with more resistance to the action of the elements, and the maintenance cost is therefore reduced to a minimum.

Bridge Railing on Bear Mountain—Hudson River Bridge

Vulcan designs vary from the simple type to the more elaborate designs introducing cast iron posts with rings and other shapes into the railing panels. An almost inexhaustible number of combinations can be made of these shapes, thereby assuring unlimited selectivity.

Bridge Railing on Roosevelt Avenue Bridge Over Flushing River, New York, N. Y.

Information and Literature

Detailed information relative to standard bridge and pipe railing designs, as well as special designs to suit architects' and engineers' requirements will be submitted on request.

When requesting estimates it is suggested that inquiries be accompanied by blue prints or sketches of requirements showing full dimensions and all possible information on size of pipe, type of fitting, finish, etc. Inquiries for pipe railings should mention the number of posts required and the spacing between posts; also the number of horizontal rails, and the method of anchorage to foundation or support.

BLAW-KNOX COMPANY

Steel Grating, Steel Steps and Steel Armoring for Concrete

2074 Farmers Bank Building, PITTSBURGH, PA.

For Sales Offices, see Steel Roof Sheathing Page

For Other Products, see Manufacturers' Index

Blaw-Knox Electroforged Steel Grating and Open Flooring

The advantages of actual (not theoretical) one-piece construction presented exclusively by Blaw-Knox Electroforged Steel Grating will be especially apparent to those who have used, or are using today, ordinary grating which is mechanically assembled. It is a simple structure, electroforged for strength and permanence, marked by an entire absence of loose parts and characterized by an extremely low maintenance cost.

Exclusive Features of Blaw-Knox Electroforged Steel Grating

Non-slip — Perfect traction is afforded by the slightly rough edges of the twisted cross bars which protrude slightly above the surface of the bearing bars.

Greatest Strength—The electroforged one-piece construction—made without rivets, slots, or cuts in the metal—utilizes full strength of the gross amount of metal. The resulting one-piece section has maximum loading capacity per pound.

Longest Life—Because of its design and exclusive method of fabrication Electroforged Grating presents a one-piece construction free from cracks, joints, or crevices of any kind. This also enables Electroforged Grating to be 100% protected by paint or galvanizing, leaving no part exposed to corrosive action.

One-piece Grating—Blaw-Knox Electroforged Grating is manufactured by laying the twisted bars across the top of the bearing bars without slotting or cutting the metal.

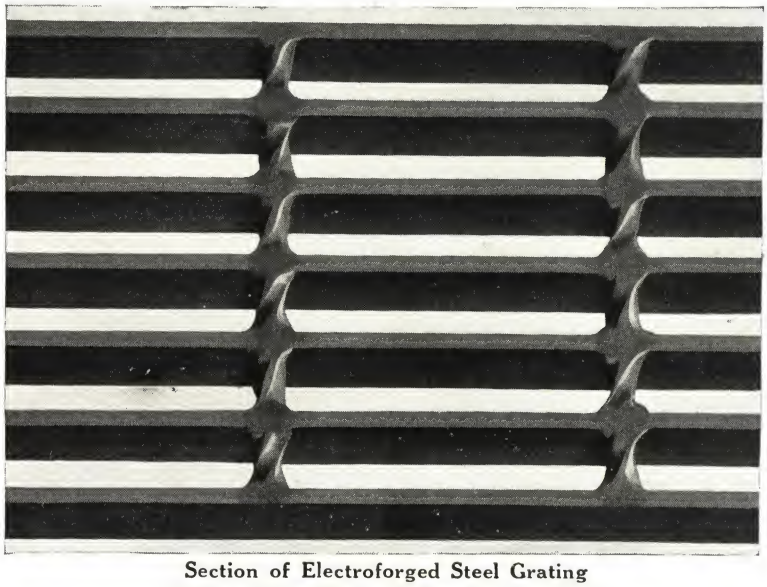
Enormous pressure and resistance welding electroforges the bar into one piece where the metals cross.

Self-cleaning — No acute angles or projections to collect debris.

Better Light and Ventilation — The construction of Blaw-Knox Electroforged Grating permits clean-cut rectangular openings.

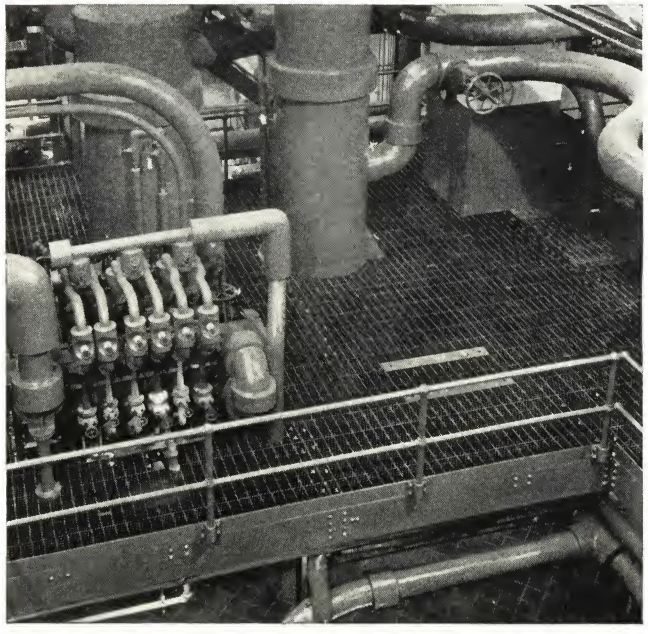
Maximum lighting and ventilation are assured.

Easily Installed — Installation cost of Blaw-Knox Grating is reduced to a minimum by a very simple and secure method of fastening the grating.

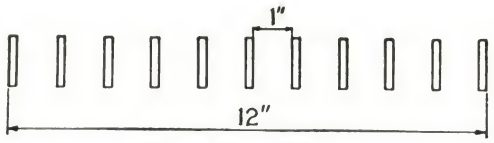


Section of Electroforged Steel Grating
Showing rigid welding and sharp, flat topped bars

Electroforged Grating in Camden (N. J.) County Park Pumping Station

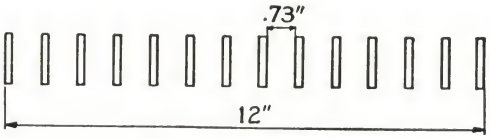


Blaw-Knox Electroforged Grating Installed in Large Power Station



Single Letter Type

11 bars per foot of width. Opening 1x3.75 in.



Double Letter Type

Used where close spacing of bearing bars is desired. 14 bars per foot of width. Opening, .73x3.75 in.

Sizes of Electroforged Gratings

Blaw-Knox grating panels are 12 in. wide. Maximum length of panels 20 ft.

Lengths of stair treads furnished to suit your requirements.

Odd widths of panels as shown in table supplied to fill out necessary dimensions.

Standard cross-bar spacing 4 in. center to center. Spacings of 3, 2½, 2 and 1¾ in. can also be furnished.

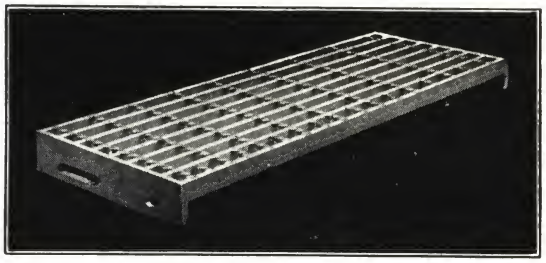
Grating Samples

The most convincing argument for the superior features of Blaw-Knox Electroforged Grating is the grating itself. An actual sample is yours for the asking.

Blaw-Knox Steel Steps

Blaw-Knox Steel Steps are made in accordance with the same principle as Blaw-Knox Electroforged Grating.

The outer edges of these steps are made doubly visible by means of an additional set of cross bars placed between the two outer bearing bars as shown below.



Blaw-Knox Steel Steps

SIZES OF BLAW-KNOX STEEL STEPS

Width	Minimum Length	Sug. Max. Length	A
Type "J"—1x3/16-in. Bars			
6"	1' 6"	3' 0"	2½"
7 3/16"	1' 6"	3' 0"	4½"
8 3/8"	1' 6"	3' 6"	4½"
9 9/16"	1' 6"	3' 6"	7"
10 11/16"	1' 6"	3' 6"	7"
Type "L"—1¼ x 3/16-in. Bars			
7 3/16"	2'	4' 0"	4½"
8 3/8"	2'	4' 0"	4½"
9 9/16"	2'	4' 0"	7"
10 11/16"	2'	4' 6"	7"
11 7/8"	2'	4' 6"	7"

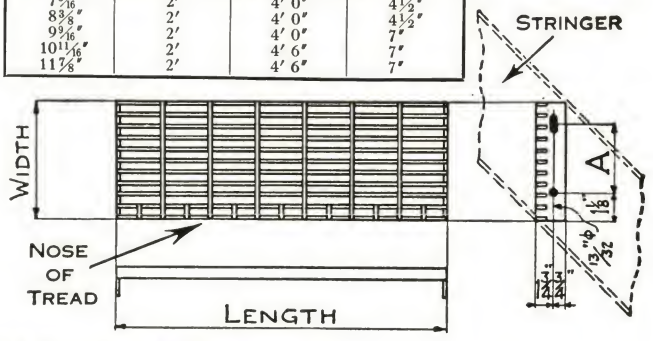


TABLE OF SAFE LOADS, BLAW-KNOX ELECTROFORGED GRATING

Maximum allowable fiber stress 16,000 lb. per sq. in.

"L" = Safe uniform load in lb. per sq. ft. "W" = Safe concentrated load in lb. per ft. of width. "C" = Deflection constant.

Type	Size of Bars		SPACING OF SUPPORTS 2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"	Weight Per Sq. Ft.	Type
G	¾" x 3/16" Bars	L	516	330	229	168	128	102								5.92	G
		C	.000171	.000418	.000867	.001607	.002762	.004382									
		W	515	412	343	294	258	229									
GG	¾" x 3/16" Bars	L	656	420	292	214	163	130								7.35	GG
		C	.000134	.000328	.000672	.001261	.002168	.003438									
		W	656	525	437	375	328	292									
J	1" x 3/16" Bars	L	917	587	407	292	229	181	147	121	102					7.68	J
		C	.000072	.000172	.000357	.000677	.001127	.001872	.002755	.004033	.005696						
		W	917	733	611	524	459	408	367	334	306						
JJ	1" x 3/16" Bars	L	1163	748	518	372	292	230	187	154	130					9.59	JJ
		C	.000056	.000134	.000280	.000532	.000884	.001526	.002166	.003169	.004469						
		W	1167	934	778	666	584	519	466	425	389						
L	1¼" x 3/16" Bars	L	1432	917	637	468	358	283	229	189	159	136	117			9.43	L
		C	.000036	.000089	.000181	.000344	.000587	.000933	.001424	.002085	.002940	.004081	.005444				
		W	1432	1145	956	819	717	636	574	521	478	440	410				
LL	1¼" x 3/16" Bars	L	1820	1162	812	597	456	360	292	241	203	173	149			11.82	LL
		C	.000029	.000070	.000142	.000270	.000461	.000733	.001160	.001634	.002305	.003208	.004275				
		W	1820	1456	1213	1040	910	810	726	661	606	560	520				
N	1½" x 3/16" Bars	L	2069	1324	920	676	518	409	331	274	229	196	169	129	102	11.18	N
		C	.000021	.000052	.000108	.000200	.000343	.000543	.000834	.001208	.001731	.002359	.003130	.005458	.008750		
		W	2060	1650	1375	1180	1030	916	825	750	687	635	590	515	459		
NN	1½" x 3/16" Bars	L	2632	1680	1169	862	660	520	421	350	292	250	212	164	130	14.04	NN
		C	.000017	.000041	.000085	.000157	.000266	.000427	.000656	.000946	.001361	.001850	.002542	.004293	.006865		
		W	2620	2100	1750	1500	1310	1166	1050	953	874	806	749	655	582		
O	1¾" x 3/16" Bars	L	2807	1797	1247	917	702	555	449	371	312	266	229	175	139	12.94	O
		C	.000013	.000033	.000068	.000126	.000213	.000343	.000525	.000766	.001087	.001496	.002004	.003443	.005482		
		W	2800	2240	1870	1600	1400	1245	1120	1020	935	862	800	700	624		
OO	1¾" x 3/16" Bars	L	3570	2282	1582	1162	893	706	572	473	397	339	291	223	177	16.28	OO
		C	.000011	.000026	.000054	.000099	.000169	.000270	.000412	.000601	.000854	.001174	.001577	.002702	.004305		
		W	3570	2855	2380	2040	1785	1585	1430	1300	1190	1100	1020	892	793		
P	2" x 3/16" Bars	L	3668	2348	1628	1195	916	724	588	484	408	347	300	228	180	14.69	P
		C	.000009	.000020	.000046	.000087	.000145	.000231	.000350	.000527	.000730	.001018	.001350	.002315	.003722		
		W	3670	2930	2440	2100	1835	1630	1468	1335	1220	1127	1048	916	815		
PP	2" x 3/16" Bars	L	4668	2988	2072	1526	1162	922	749	616	520	442	382	290	230	18.51	PP
		C	.000007	.000017	.000036	.000068	.000114	.000181	.000275	.000414	.000569	.000799	.001060	.001821	.002913		
		W	4660	3730	3105	2665	2330	2060	1866	1696	1555	1434	1332	1166	1037		
Q	2¼" x 3/16" Bars	L	4655	2979	2069	1520	1164	920	745	615	517	441	380	291	230	16.43	Q
		C	.000006	.000015	.000038	.000059	.000101	.000161	.000246	.000359	.000510	.000714	.000945	.001607	.002591		
		W	4650	3710	3100	2655	2320	2065	1860	1690	1550	1430	1330	1163	1033		
QQ	2¼" x 3/16" Bars	L	5922	3780	2632	1932	1481	1166	948	782	658	562	484	370	293	20.74	QQ
		C	.000005	.000012	.000030	.000046	.000079	.000127	.000193	.000282	.000401	.000560	.000742	.001263	.002004		
		W	5910	4740	3940	3380	2960	2630	2365	2150	1970	1820	1690	1480	1315		

NOTE—Spans to right of heavy line not recommended.

Deflections: To obtain the deflection under any uniform load per square foot on a given span, multiply the load per square foot by the deflection constant "C" from the table for the given span. The result will be the deflection in inches at center of span under the actual load.

IRVING IRON WORKS COMPANY

ESTABLISHED IN 1902

Manufacturers of Steel Flooring and Floor Armoring in Continuous and Paneled Types, Steel Safety Steps, and Continuous Steel Pavement

Third and Creek Streets, LONG ISLAND CITY, N. Y.

SALES OFFICES IN PRINCIPAL CITIES—SEE LOCAL TELEPHONE BOOK
BRITISH LICENSEES: Estler Brothers, South Molton Road, Victoria Docks, LONDON, E. 16, ENGLAND
CANADIAN LICENSEES: Crowe's Iron Works, GUELPH, ONTARIO, CANADA

Products

IRVING "CONTINUOUS" STEEL FLOORING and FLOOR ARMORING; "VIZABLEDG" SAFSTEPS.

Also Irving "Continuous" Steel Pavement; Irving "Subway" (paneled) Steel Flooring and Floor Armoring; "Safkar" Car Steps; other forms of steel flooring and grating.

Trade-marks

The following trade-mark names are registered in United States Patent Office, are the exclusive property of this company, and cannot legally be used in connection with any flooring, grating, pavement or safety step made by any other firm: "Irvico," "Subway," "Reticuline," "Continuous," Unified," "Vizabledg," "Safstep," "Safkar," "Sunway," "Sublit."

The Irving Mesh

The shape of the mesh is one of the distinctive features of Irving Flooring, Floor Armoring and Safsteps. The S-curve given the reticuline (or crimped) bars offers two outstanding advantages. First—it combines a wedge-and-stop effect as a positive and unfailing resistance to slipping in any direction. Second—it affords complete bridging of the interbar gaps without sacrifice of open area and with the minimum lodgement for dirt. It gives the evenness of a solid surface, with the light-and-ventilation features of an open mesh structure. It is safe, silent, comfortable and clean.

The "Continuous" Feature

For many years, Irving Flooring and Armoring—like all other gratings before—was made in small panels which were assembled on the job in the finished floor. The ultimate strength of such a floor is only the ultimate strength of its weakest unit. Furthermore, unless laid with extreme care as to matching and anchoring the panels, the assembled job was marred by irregular joint lines, hammered and bent bar ends, and hazardous, loose, "wobbly" panels. Some three years ago, Irving Engineers designed the improvement which eliminated all the disadvantages of the paneled steel floor without sacrificing the advantage of panel units in shipping, handling and assembling. This was achieved by means of the patented "streamline" splice for joining individual fabricated flooring units in a "Continuous" steel mesh floor of any desired shape or area. While a completed floor of Irving "Continuous" Flooring is an unbroken unit, yet sections may still be removed, if desired, to accommodate changes in piping, machine arrangement, floor layout, etc.

Joint lines, offensive to the eye and offering a hazard to foot and obstacles to wheels, are completely done away with.

A "Continuous" Steel Floor is a unit of uniform strength. Laboratory tests prove the "Streamline" splice to have the strength of the flooring itself. "Continuity" is an exclusive Irving feature. Yet it costs no more.

Literature and Data

Condensed engineering data are given on this and the following page. For complete construction details, sizes, specifications, etc., on the entire "Irving" line, write for Engineering Data Sheet No. 138-16.

Standard Construction Details

Material Sizes—Irving standard construction is limited to certain depths and thicknesses of straight and reticuline bars on account of standardized fabrication. Deviations from these cause delay and increase the price, and may even be impossible or prohibitive in cost.

Spacing—Irving standard construction, produced by complicated precision dies and gauges, is necessarily restricted to certain standard patterns and meshes, fixing the spacing between rivets and the spacing between bars. These limitations necessarily fix definitely the widths of panels, etc.

Mesh—Irving Paneled Flooring can be furnished in any of the five types sketched on following page. But Irving "Continuous" Flooring can be furnished only in Types "M" and "V."

Sizes of Units—*Widths*—For convenience in fabricating, handling, shipping and installing Irving Flooring, panels or sections are standardized as follows:

¾ and 1-in. depths—maximum width about 21 in.

1¾ to 2¼-in. depths—maximum about 14 in.

The table below gives the over-all widths of all possible units from 3⅞ in. up, for Irving Types "M" and "O" only.

PANEL WIDTHS, "M" AND "O"

Thickness bars, in.	Width of unit or section, in.																		
⅛	3 7/8	5 1/8	6 3/8	7 5/8	8 7/8	10 1/8	11 3/8	12 5/8	13 7/8	15 1/8	16 3/8	17 5/8	18 7/8	20 1/8	21 3/8	22 5/8	23 7/8		
5/16	4 1/8	5 7/16	6 3/4	8 1/16	9 3/8	10 11/16	12	13 5/16											

Note: Add ⅛ in. to above widths to allow for rivet heads on side of panels.

Lengths—Length can be anything up to 12 ft., but for convenience to all should preferably be kept 6 ft. or under so far as possible. Maximum length for "Continuous" sections is 7 ft. 11½ in. center to center of "Streamline" splice.

Paint—One shop priming coat of good black graphite paint is standard. Deviation from this causes delay and increases price.

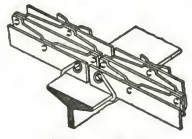
Uniform Quality—Irving Flooring, like all Irving products, is manufactured, not built; which implies quantity purchase of materials, standardized machine methods, specialized equipment, skilled and experienced supervision and personnel. All this results in uniformly high quality at low cost.

Layouts—We urge that when ordering you send dimensioned layout of supporting structure and limiting outline of flooring area to be covered and let us make the "Irving Flooring Layout" for your approval.

Facilities and Service—The Irving factory is one of the largest in the world devoted exclusively to the manufacture of steel flooring, armoring and steps. Large stocks of steel are always on hand. A highly organized factory force is always maintained. Deliveries are made on the date promised, regardless of quantity. An experienced engineering staff is always ready to work out flooring problems, layouts, etc., for the assistance of prospective buyers. Service, in the true sense, goes with and follows after every order.

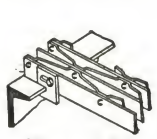
Orders—All orders should designate the type, symbol and depth to avoid mistake—thus "Irving" Flooring, Type "M," 3S, 1¼ in. deep.

Fastening Devices—Standard quotations always include the necessary fastening devices, or anchors, selected for the conditions from the three types below:



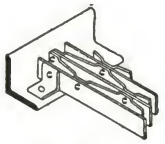
Type C-1

¼-in. *round hooks*, furnished as standard equipment unless otherwise specified; sometimes furnished straight, of varying length, to be bent on the job



Type C-2

Adjustable clip, furnished for use with angle or channel iron support; can be used only with Types "M," "O" and "V"; requires full data on location of supports



Type C-4

Fixed clip, requiring either accurate location of holes in supporting structure, or drilling in the field

IRVING "CONTINUOUS" (TRADE-MARK) STEEL FLOORING AND FLOOR ARMORING

Table of Safe Loads (Uniformly Distributed) for Types "M" and "O" only—for Types "Q" and "R" Increase 40%
For Type "V" Decrease 50%

Type of mesh	Symbol and depth	Specifications, in. Straight bars	Specifications, in. Reticuline bars	Wt. lb. per sq. in. Type M	O	Q	R	V	*	Safe loads for various spans (Lb. per sq. ft.) 1 ft., 6 in.	2 ft.	2 ft., 6 in.	3 ft.	3 ft., 6 in.	4 ft.	4 ft., 6 in.	5 ft.	5 ft., 6 in.	6 ft.	7 ft.	8 ft.	9 ft.
To be specified in ordering. (See diagrams below)	1S 3/4"	3/4 x 1/8	1/2 x 1/8	5.4	5.8	7.6	7.8	3.3	L	695	390	250	173	127	97	77	63			Note: Spans to right of heavy line not recommended.		
									C	000045	.00011	.00069	.00143	.00265	.0040	.0055	.0083					
	2S 1"	1 x 1/8	3/4 x 1/8	7.6	8.2	10.7	11.1	4.7	L		695	445	308	227	173	138	112	93				
									C		.00012	.00029	.0006	.00112	.0019	.00305	.00465	.0068				
	†2SA 1"	1 x 3/16	3/4 x 1/8	9.4	9.9	12.8	13.2	5.7	L		1040	665	460	340	260	206	167	140	116			
									C		.00008	.00019	.0004	.00075	.00127	.00204	.0031	.00454	.00645			
	3SA 1 1/4"	1 1/4 x 1/8	1 x 1/8	9.8	10.4	13.7	14.2	6.1	L			700	480	358	273	215	175	143	120			
									C			.00015	.00031	.00057	.00097	.00155	.00235	.00348	.0049			
	†3S 1 1/4"	1 1/4 x 3/16	1 x 1/8	11.9	12.6	16.4	16.8	7.4	L			1100	730	535	410	325	265	215	185	135	100	80
									C			.0001	.00021	.00038	.00065	.00105	.0016	.0024	.0033	.0062	.0105	.0169
	4SA 1 1/2"	1 1/2 x 1/8	1 x 1/8	10.9	11.6	15.3	15.8	6.7	L			1020	707	516	396	314	253	210	173	130	100	77
									C			.000087	.000178	.000333	.00057	.00091	.00138	.00203	.00287	.0053	.00903	.0145
	†4S 1 1/2"	1 1/2 x 3/16	1 x 1/8	13.5	14.1	18.5	18.9	8.2	L			1530	1050	775	595	470	380	315	265	202	150	115
									C			.00006	.00012	.00023	.00038	.00061	.0009	.0014	.0019	.0036	.0061	.0097
	†5S 1 3/4"	1 3/4 x 3/16	1 x 1/8	15.0	15.6	20.5	20.9	9.0	L			2060	1435	1050	810	635	520	425	360	265	200	160
									C			.00004	.00008	.00014	.00024	.00038	.00058	.00085	.0012	.0022	.0038	.0061
	†6S 2"	2 x 3/16	1 x 1/8	16.8	17.4	22.8	23.3	10.9	L			2700	1875	1375	1055	830	675	560	470	345	265	210
									C			.00003	.00005	.00009	.00016	.00025	.00039	.00057	.0008	.0015	.0026	.0041
	†7S 2 1/4"	2 1/4 x 3/16	1 x 1/8	18.3	18.9	25.0	25.4	10.8	L			3460	2400	1765	1350	1065	865	715	600	440	340	265
									C			.00002	.00004	.00007	.00011	.00018	.00027	.0004	.00057	.0011	.0018	.0029

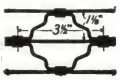
*L—Safe uniform load in lb. per sq. ft. C—Deflection constant.

Deflections—To obtain the deflection under any uniform load per square foot on a given span, multiply load per square foot by the deflection constant "C" from the table for given span. The result will be the deflection in inches at center of span under full load.

Concentrated loadings—Note that above table is for "uniformly distributed loads." Many cases of concentrated loads, wheel loads, etc., occur and it is vital that the flooring should be designed to carry these concentrations. Be sure and give us concentrated loadings in your inquiry.

Heavy loads—Occasionally there are open flooring requirements calling for very heavy loading, especially heavy wheel concentration. These, of course, call for heavy "special" designs and we are prepared to design and fabricate an Irving "Subway" Flooring that will meet your requirements.

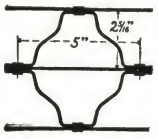
Type "M"
7 in. c. to c. rivets
1⅛ in. between bars



Type "O"
3½ in. c. to c. rivets
1⅛ in. between bars

Type "Q"
7 in. c. to c. rivets
¾ in. between bars

Type "R"
3½ in. c. to c. rivets
¾ in. between bars



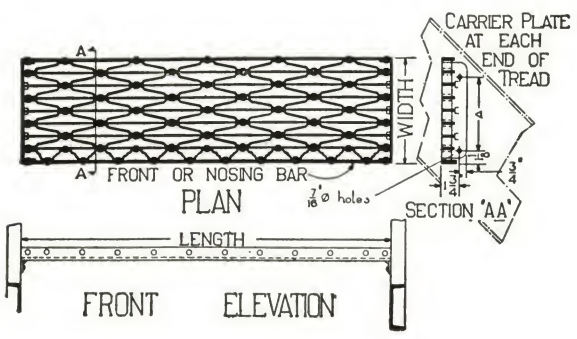
Type "V"
5 in. c. to c. rivets
2 5/16 in. between bars

Irving "Continuous" Armoring

As a surface armoring for concrete or mastic floors, providing a steel mesh structure to resist the shock and grind of traffic or falling weights, the distinctive Irving "Continuous" feature affords the unified quality which 100-per-cent-effective armoring demands. Conditions vary so, that no set rules can be used in determining size and type of mesh, or sizes of steel. Irving Types "M" and "O" have been found to meet practically all conditions in industrial service. Type "V," with concrete or asphalt filler, is being used in increasing quantities as a "Continuous" steel pavement for highways, bridge and tunnel floors, bus stops, etc. In the load table above, the six standard Irving sizes recommended for armoring are indicated by † before the symbol.

Irving "Vizabledg" Safsteps

Records show that the vast majority of accidents on stairways and ladders are due either to slipping on the tread or edge, or to overstepping the edge. The Irving "Vizabledg" Safstep provides against both hazards—with a "slip-proof" surface, and a "miss-proof" edge. The construction uses the Type "M" mesh (7-in. rivet centers) except in the reticuline bar next the nosing bar which has the Type "O" (3½-in.) crimp. This abrupt change in mesh makes an edge which stands out boldly in contrast with the step below. Each Safstep is a self-contained unit with punched carrier plate attached. Standard specifications are given in the table below and in the drawing in the adjoining column.



STANDARD "VIZABLEDG" STOCK SIZES

Order by stock number from table below, for example: "50 Irving Vizabledg" Safsteps, stock No. 14.

Stock No.	Width, in.	Length, ft.	Length, in.	Distance "A," in.	Weight, lb.	Specifications (see * below)
1	5 3/8	1	7	2 1/2	5.5	A
2	5 3/8	1	10 1/2	2 1/2	6.5	A
3	5 3/8	2	2	2 1/2	7.3	A
4	5 3/8	2	5 1/2	2 1/2	10.9	B
5	5 3/8	3	0 1/2	2 1/2	13.6	B
6	7 7/8	1	7	4 1/2	7.6	A
7	7 7/8	1	10 1/2	4 1/2	9.0	A
8	7 7/8	2	2	4 1/2	10.0	A
9	7 7/8	2	5 1/2	4 1/2	15.2	B
10	7 7/8	3	0 1/2	4 1/2	18.4	B
11	8 1/4	3	7 1/2	4 1/2	32.0	C
12	8 1/4	3	11	4 1/2	34.9	C
13	8 1/4	4	6	4 1/2	39.8	C
14	10 3/8	1	7	7	9.6	A
15	10 3/8	1	10 1/2	7	11.1	A
16	10 3/8	2	2	7	13.0	A
17	10 3/8	2	5 1/2	7	19.2	B
18	10 3/8	3	0 1/2	7	23.2	B
19	10 7/8	3	7 1/2	7	41.4	C
20	10 7/8	3	11	7	44.7	C
21	10 7/8	4	6	7	51.8	C
22	12 3/16	3	7 1/2	7	47.0	C
23	12 3/16	3	11	7	50.6	C
24	12 3/16	4	6	7	57.7	C

*In dimensions of steel members, Safsteps are furnished in three types—A, B and C—conforming with the following specifications:

	A	B	C
Straight bars, in	3/4 × 1/8	1 × 1/8	1 1/4 × 3/16
Reticuline bars, in	1/2 × 1/8	3/4 × 1/8	1 × 1/8
Nosing bars, in	1 × 1/4	1 1/4 × 1/4	1 1/2 × 1/4
Carrier bars, in	2 1/2 × 1/8	2 1/2 × 1/8	2 1/2 × 1/8

HENDRICK MANUFACTURING COMPANY

37 Dundaff Street, CARBONDALE, PA.

SALES OFFICES AND REPRESENTATIVES

ATLANTA, GA., Rittelmeyer & Co.
BALTIMORE, MD., J. B. Embick
BINGHAMTON, N. Y., C. Y. Cushman
BIRMINGHAM, ALA., Keiser-Geismer Engineering Co.
BOSTON, MASS., Engineering Sales Corporation
BUFFALO, N. Y., Hendrick Manufacturing Company
CHARLESTON, W. VA., Riffe & Thomas
CHICAGO, ILL., Hendrick Manufacturing Company
CLEVELAND, OHIO, A. E. Quere Co.
CINCINNATI, OHIO, J. F. Corlett & Co.
DETROIT, MICH., H. W. Reindel
ERIE, PA., Henry Althof's Sons Co.
HAZLETON, PA., Hendrick Manufacturing Company
HOUSTON, TEX., Hartwell Iron Works
INDIANAPOLIS, IND., Engineering Metal Products Co.
LOS ANGELES, CAL., Continental Building Specialties Co.
MONTREAL, CAN., Reliance Railway Appliance Co.
NEW YORK, N. Y., Mitchell-Tappen Co.
PHILADELPHIA, PA., Engineering Co. of Philadelphia
PITTSBURGH, PA., Hendrick Manufacturing Company
ST. LOUIS, MO., Myron Glassberg
ST. PAUL, MINN., Hendrick Manufacturing Company
SALT LAKE CITY, UTAH, Steel Engineers Company
SAN FRANCISCO, CAL., Price Building Specialties Co.
SEATTLE, WASH., F. T. Crowe
TULSA, OKLA., Circle Corporation

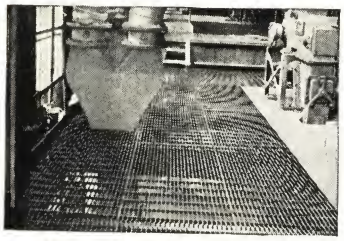
For Hendrick Perforated Metal Grilles, see Manufacturers' Index

MITCO INTERLOCKED STEEL GRATING, ARMORGRIDS AND SHUR-SITE TREADS

Mitco Interlocked Steel Grating

Wherever open steel flooring is required, Mitco is the ideal selection. It is made of square edge steel bars (high in tensile strength) which are firmly locked in position under hundreds of tons' hydraulic pressure. The bars never loosen, no matter how severe the vibration, shock or abuse. In Mitco there are no bolts, rivets or welding to loosen or permit development of weakness. Panels of Mitco are high in strength and rigidity.

MITCO
Reg. Trade Mark

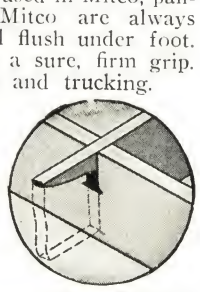


Mitco Grating and Mitco Treads were selected by Hunt, Mirk & Co. of San Francisco, for installation in the plant of Riverside Cement Company, Riverside, Cal.

Mitco has rectangular openings—an important factor in preventing clogging. Mitco has no acute angles to catch and hold dirt. Moreover, Mitco's rectangular openings are 90% of panel area, thus assuring maximum light and ventilation.

As only square-edge bars are used in Mitco, panels of Mitco are always even and flush under foot. Feet get a sure, firm grip. Greater safety is assured in both walking and trucking.

Mitco is furnished in 5 types with varying sizes of rectangular openings. Panels come in sizes to fit openings of all dimensions and shapes. Our engineers will gladly assist in the selection of the proper type of Mitco and in developing the most efficient layout for each installation. Write for a copy of the Mitco bulletin.



Mitco Joints, produced under hundreds of tons' hydraulic pressure, insure permanently locked panels always free from loose or rattling bars.

Mitco Armorgrids

For armoring (or reinforcing) floors, platforms, ramps, driveways and similar structures poured of concrete, cement or other plastics. Mitco Armorgrids are merely laid on the rough base of the structure, leveled up, and the finishing fill of flooring material poured into the mesh of the Armorgrids.

Mitco Armorgrids reinforce this floor in the plant of Briggs Mfg. Co., Detroit, Mich.

Of all floor armorings, Mitco Armorgrids are simplest to install and most economical. They require no bolting of panels, no tie rods, no fitting, fastening or assembly of any kind.

By providing a rail-like steel mesh which bears the brunt of shocks and abuse, Mitco Armorgrids prevent development of cracks and wear, prolong the life of the structure and minimize maintenance. Write for a copy of the Mitco Armorgrid bulletin.

Mitco Shur-Site Treads

Light in weight yet strong and durable, non-slipping and non-clogging, with highly visible front edges, Mitco Shur-Site Treads are ideal for stair, ladder, fire escapes.

The front edge of every Mitco Tread is very clearly defined by means of a deep nosing bar, bent back at an angle under the front edge of the Tread. This bar makes the front edge of the Tread stand out clearly, and prevents falls caused by overstepping the edge. The nosing bar is self-clearing and has no pocket to collect refuse, snow or ice. Mitco Shur-Site Treads are made in widths and lengths as required, and come with carrier plates ready for attachment to stair stringers. Write for bulletin.

Mitco Shur-Site Treads and Mitco Interlocked Steel Grating were selected by Sanderson & Porter for installation in the Williamsport station of the Potomac Edison Co.

TABLE OF SAFE LOADS AND DEFLECTIONS FOR "MITCO" GRATING
SAFE LOADS IN POUNDS BASED ON FIBRE STRESS OF 16,000 POUNDS PER SQ. INCH.
Loads can be safely increased approximately 50% without permanent deformation or undesirable deflection.

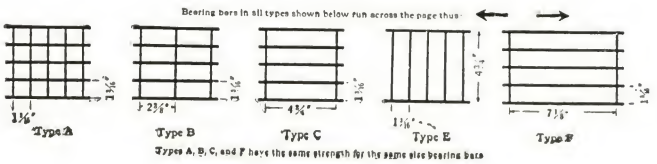
Depth and Type	Bearing Bars: Size Inches	Bearing Bars: Spacing C to C	Cross Bars: Size Inches	Cross Bars: Spacing C to C	Weight Sq. Foot	SPAN IN FEET: 2'0"	2'6"	3'0"	3'6"	4'0"	5'0"	6'0"	7'0"	8'0"	9'0"	10'0"
1" Light C	1 x 1/8	1 1/16"	7/8 x 1/8	4 3/4"	5.5 lbs.	560	360	250	186	140						
"D"						.06	.09	.14	.19	.24						
1" C	1 x 3/16	1 1/16"	7/8 x 1/8	4 3/4"	7.8 lbs.	835	534	370	273	208	133	93				
1" E	1 x 1/8	4 3/4"	7/8 x 3/16	1 1/16"	6.3 lbs.	208	133	93	68	52						
"D"						.06	.11	.17	.24	.31	.48	69				
1 1/4" C	1 1/4 x 3/16	1 1/16"	1 x 1/8	4 3/4"	9.5 lbs.	1410	900	627	445	352	225	157	111			
1 1/4" E	1 1/4 x 1/8	4 3/4"	1 x 3/16	1 1/16"	6.7 lbs.	352	225	156	111	88	56					
"D"						.05	.10	.14	.18	.25	.36	.56	75			
1 1/2" C	1 1/2 x 3/16	1 1/16"	1 x 1/8	4 3/4"	11.0 lbs.	1875	1200	834	612	468	300	208	153	117	93	
1 1/2" E	1 1/2 x 1/8	4 3/4"	1 x 3/16	1 1/16"	7.1 lbs.	468	300	208	153	117	75	52				
"D"						.04	.08	.11	.15	.21	.32	.46	.63	.82	1.04	
1 3/4" C	1 3/4 x 3/16	1 1/16"	1 x 1/8	4 3/4"	12.5 lbs.	2560	1640	1140	838	640	410	285	210	160	127	103
1 3/4" E	1 3/4 x 1/8	4 3/4"	1 x 3/16	1 1/16"	7.5 lbs.	640	410	285	210	160	103	71	52			
"D"						.03	.07	.10	.13	.18	.25	.40	.54	.70	.90	1.10
2" C	2 x 3/16	1 1/16"	1 x 1/8	4 3/4"	14.0 lbs.	3340	2140	1480	1090	834	534	371	272	208	165	133
2" E	2 x 1/8	4 3/4"	1 x 3/16	1 1/16"	7.9 lbs.	835	535	370	272	209	134	93	68	52		
"D"						.03	.06	.09	.11	.15	.24	.35	.47	.59	.78	.96
2 1/4" C	2 1/4 x 3/16	1 1/16"	1 x 1/8	4 3/4"	15.5 lbs.	4220	2700	1875	1380	1055	675	470	345	264	208	169
2 1/4" E	2 1/4 x 1/8	4 3/4"	1 x 3/16	1 1/16"	8.2 lbs.	1055	675	470	345	264	169	117	86	66		
"D"						.02	.05	.08	.10	.14	.21	.31	.42	.54	.70	.86

"MITCO" DRIVEWAY GRATINGS (For Heavy Traffic, Coal "Grizzlies", Etc.)

2 1/4" C	2 1/4 x 3/16	1 1/16"	2 x 1/8	4 3/4"	36.8 lbs.	8440	5400	3750	2760	2100	1350	940	690	528	416	338
2 3/4" C	2 3/4 x 3/16	1 1/16"	2 1/4 x 1/8	4 3/4"	44.6 lbs.	13900	8880	5640	4530	3470	2220	1540	1130	865	685	555
3 1/4" C	3 1/4 x 3/16	1 1/16"	2 1/4 x 1/8	4 3/4"	51.7 lbs.		12400	7850	6310	4840	3100	2150	1580	1210	955	775
3 3/4" C	3 3/4 x 3/16	1 1/16"	2 1/4 x 1/8	4 3/4"	58.7 lbs.		16500	10470	8410	6440	4120	2862	2100	1610	1272	1031

"D"—Deflection in inches for uniform live load.
Types C and E have same deflection for same spans.
Driveway can also be furnished in Type B having same strength as Type C and weighing approximately six lbs. per sq. ft. more.
For safe concentrated load at center of span multiply tabulated load by span and divide by two. This applies to both tables above.

Bearing bars in all types shown below run across the page thus: ← →



Types A, B, C, and F have the same strength for the same size bearing bars

KERLOW STEEL FLOORING COMPANY

222-238 Culver Avenue
JERSEY CITY, N. J.

"KERLOW"
TRADE-MARK REG. U. S. PAT. OFF.

Products

KERLOW METAL FLOORING (open) (both Reticulated and Rectangular Designs) for: Industrial and Marine Gratings and Safety Steps; Tank, Freight, Refrigerator and Passenger Car Gratings; Ice and Coal Bunker Gratings; Dry Kiln Floors and Racks; Motor Truck Radiator Guards; Heavy Duty Manhole Covers; Steel Tower Platforms; Plate Floors and Steel Construction; Floor and Highway Armoring.

Engineering Service

The KERLOW STEEL FLOORING COMPANY retains competent engineers, experienced in floor, stair and steel construction. To secure the most practical and economical type flooring for any particular project, we strongly recommend consultation with the home office or with our local sales office, at the time the project is under design. A word to your local Kerlow representative will place our engineering department at your disposal, promptly and without obligation.

KERLOW METAL FLOORING AND ITS ADAPTATIONS

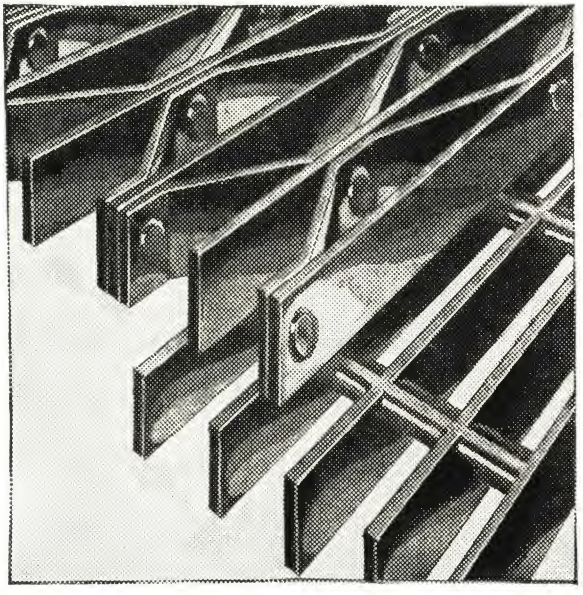
Description

Kerlow Metal Flooring is a superior, all-purpose fabricated floor, fireproof, ventilating and comfortable to walk and work upon.

This superiority is due to the following factors, i.e. economy (the first cost is less and the last); long life (outlasts many floors of other materials); strong (metal bars on edge permanently and closely united); clean (self-cleansing, need not be swept); and safe (slipproof in all directions).

There are two general types of Kerlow Floors: Series V (reticulated in design) having triangular openings and Series F (rectangular in design) having rectangular openings.

Both Series V and F types of grating flooring are standardized in thirteen different thicknesses, of several bar spacings according to the traffic and work conditions to be met.



Series V Floors—Include the double bearing bar reversible type of grating as well as the single bar non-reversible type.

Series F Floors—Have single bearing bars and while this type of grating has rectangular openings, it is second only to Kerlow Series V Floors.

Specifications

The following two alternate paragraphs will usually cover all conditions and one or the other should be included in all general specifications, under gratings:

All floor and stair step material shall be that manufactured by the KERLOW STEEL FLOORING COMPANY, *Jersey City, N. J.*

Or as an alternate to the above.

All floor and stair step material shall be of reversible open metal flooring (bars on edge) having nineteen full depth bearing bars to the square foot, permanently secured to each other at six and three-quarter inch intervals.

It is often advisable to be explicit and to list under "Work Included" in the general grating flooring specifications, the various floor areas to be constructed of Kerlow Metal Flooring together with the prescribed live load. When more than one size of flooring is used, list the areas to be covered with each size, separately.

It is sometimes advisable to specify under "Steel Construction" that *all steel work for the support of the Kerlow Metal Floors shall be designed to carry the prescribed live and dead loads;* and that the steel contractor shall provide steel framing around all openings larger than 12 in. square.

Kerlow Safety Steps

A strong, light, sanitary industrial stair and ladder tread. A rectangular section of Kerlow Open Flooring—provided with an oversize impact nosing bar and with the Kerlow (patented) Stair Step Carrier at each end. These step carriers are so designed that the step can be bolted to the stair stringers, despite variations in the stringer hole spacing.

These steps are made to fit any and all stair conditions.

Submit step size and quantities for prices.

Metals

The ramifications of modern industry have created diversified plant conditions, and where the use of chemicals having corrosive effects upon certain metals predominate, the use of such metals in grating flooring have been extremely hazardous. Obviously, such floors will not stand up nor have the life that should reasonably be expected.

These difficulties can easily be avoided by the use of the proper ferrous or non-ferrous alloy flooring as produced by the Kerlow Company. Suitable recommendations will gladly be made, upon request.

In Ordering

There is nothing complicated in the purchase of Kerlow, the real industrial floor. Give size and location of supports together with the anticipated loadings. Upon receipt of this information, prices and proper recommendations will promptly be made, together with suitable guarantees, to your satisfaction.

Cost and Ease of Setting

In the past, the cost of Kerlow Metal Floors has been slightly higher than that of some lighter types. This was to be expected due to the extra built-in life and strength of Kerlow Floors. However, due to manufacturing improvements, costs today are well within the general price range.

Kerlow Products are all exceedingly easy to set. The metal floors, for instance, are shipped in convenient sized panels, for installation as a sectional or continuous floor. Skilled labor is not needed; no tools are required other than wrench and screwdriver.

Kerlow Series VN Gratings

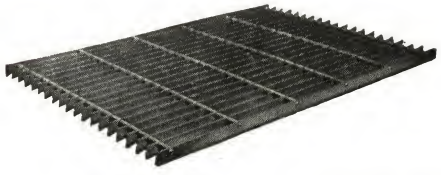
Specifications and Safe Loads—A standard reticulated mesh for all floors and safety steps. Reticulated bars less depth. Maximum opening between bars 1 in. Rivets 6.75 in. on centers.

TABLES OF UNIFORM SAFE LOADS IN POUNDS PER SQUARE FOOT

Based upon fibre stress 16,000 lb. per sq. in.

Load—Uniform safe load in lb. per sq. ft. D—Deflection under given uniform loads

Type No.	Specifications	Wt., lb. per sq. ft.		Spans in feet and inches													
				2′-6″	3′-0″	3′-6″	4′-0″	4′-6″	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	8′-6″	9′-0″
VN- 1	St. bars ¾″x⅛″ Cr. bars ¾″x⅛″	6.5	Load	319	221	164	125	99	80	66							
			D	.20	.31	.42	.51	.65	.80	1.01							
VN- 2	St. bars 1″ x⅛″ Cr. bars ¾″x⅛″	7.5	Load	472	328	241	185	146	118	98	82	70					
			D	.15	.22	.30	.39	.49	.60	.72	.85	.99					
VN- 3	St. bars 1″ x3/16″ Cr. bars ¾″x⅛″	9.0	Load	622	432	318	243	192	155	129	108	92	79	69			
			D	.12	.17	.23	.32	.40	.48	.57	.68	.79	.91	1.04			
VN- 4	St. bars 1¼″x⅛″ Cr. bars ¾″x⅛″	8.5	Load	719	499	368	281	222	180	149	125	106	92	80	70	62	
			D	.10	.15	.20	.27	.35	.42	.50	.59	.69	.80	.92	1.07		
VN- 5	St. bars 1¼″x3/16″ Cr. bars ¾″x⅛″	10.5	Load	958	668	490	374	296	239	198	167	142	122	106	93	83	74
			D	.10	.14	.18	.24	.31	.39	.48	.55	.65	.75	.86	.97	1.09	1.24
VN- 6	St. bars 1½″x⅛″ Cr. bars ¾″x⅛″	9.5	Load	1070	744	548	418	331	267	221	186	158	137	119	104	92	83
			D	.09	.13	.17	.22	.27	.35	.43	.51	.59	.67	.77	.87	.98	1.11
VN- 7	St. bars 1½″x3/16″ Cr. bars ¾″x⅛″	12.0	Load	1410	980	722	552	436	352	292	245	209	180	157	138	122	109
			D	.09	.12	.16	.21	.27	.34	.41	.48	.56	.65	.75	.85	.96	1.08
VN- 8	St. bars 1¾″x⅛″ Cr. bars ¾″x⅛″	11.0	Load	1422	988	728	556	440	355	294	247	211	182	158	139	123	110
			D	.08	.11	.14	.18	.23	.28	.34	.40	.47	.55	.63	.71	.82	.93
VN- 9	St. bars 1¾″x3/16″ Cr. bars ¾″x⅛″	13.5	Load	1884	1310	965	737	582	471	390	327	279	241	209	184	163	145
			D	.07	.10	.13	.17	.22	.27	.33	.39	.46	.53	.61	.69	.79	.89
VN-10	St. bars 2″ x⅛″ Cr. bars 1″ x⅛″	13.0	Load	1890	1314	968	739	584	472	391	328	280	242	210	185	164	146
			D	.07	.10	.12	.16	.20	.25	.31	.38	.43	.49	.55	.62	.69	.78
VN-11	St. bars 2″ x3/16″ Cr. bars 1″ x⅛″	16.0	Load	2490	1730	1273	974	770	622	516	432	369	318	277	243	215	192
			D	.06	.09	.12	.15	.19	.24	.30	.36	.41	.47	.53	.60	.68	.77
VN-12	St. bars 2¼″x⅛″ Cr. bars 1″ x⅛″	14.0	Load	2452	1704	1252	959	757	613	508	426	363	313	272	239	212	189
			D	.06	.08	.11	.14	.18	.23	.28	.34	.39	.45	.51	.58	.65	.74
VN-13	St. bars 2¼″x3/16″ Cr. bars 1″ x⅛″	17.5	Load	3212	2230	1640	1255	994	803	665	557	475	410	356	314	278	248
			D	.05	.08	.11	.13	.17	.22	.27	.32	.38	.44	.49	.54	.62	.70



Kerlow Series FN Gratings

Specifications and Safe Loads—A standard rectangular mesh for all floors and safety steps. Maximum opening between bars 1.125 in. Cross bars (mechanically locked) 6.75 in. on centers.

TABLES OF UNIFORM SAFE LOADS IN POUNDS PER SQUARE FOOT

Based upon fibre stress 16,000 lb. per sq. in.

Load—Uniform safe load in lb. per sq. ft. D—Deflection under given uniform loads

Type No.	Specifications	Wt., lb. per sq. ft.		Spans in feet and inches													
				2′-6″	3′-0″	3′-6″	4′-0″	4′-6″	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	8′-6″	9′-0″
FN- 1	St. bars ¾″x⅛″	5.0	Load	200	139	102	78	61	50	41							
			D	.19	.27	.36	.48	.59	.74	.89							
FN- 2	St. bars 1″ x⅛″	6.1	Load	352	247	180	138	109	88	73	62	52					
			D	.14	.20	.27	.35	.44	.56	.67	.81	.93					
FN- 3	St. bars 1″ x3/16″	7.9	Load	502	352	257	196	156	125	105	88	74	64				
			D	.13	.19	.26	.34	.43	.55	.66	.80	.92	1.09				
FN- 4	St. bars 1¼″x⅛″	7.1	Load	557	387	284	218	172	139	115	96	82	71	62	54		
			D	.11	.17	.22	.29	.37	.45	.54	.65	.76	.88	1.01	1.15		
FN- 5	St. bars 1¼″x3/16″	9.4	Load	794	552	403	310	245	198	164	138	117	101	88	77	68	
			D	.10	.16	.21	.28	.36	.44	.53	.63	.74	.86	.98	1.12	1.30	
FN- 6	St. bars 1½″x⅛″	8.2	Load	800	556	408	313	247	200	166	139	118	102	89	78	69	.62
			D	.10	.14	.19	.25	.31	.38	.46	.54	.64	.73	.84	.96	1.07	1.20
FN- 7	St. bars 1½″x3/16″	10.9	Load	1140	778	581	446	352	285	236	197	168	145	127	111	98	88
			D	.09	.13	.18	.24	.30	.37	.45	.52	.62	.71	.81	.93	1.04	1.16
FN- 8	St. bars 1¾″x⅛″	9.3	Load	1085	756	555	425	336	272	225	189	161	139	121	106	94	84
			D	.08	.12	.16	.21	.26	.33	.39	.46	.54	.62	.71	.81	.93	1.04
FN- 9	St. bars 1¾″x3/16″	12.4	Load	1550	1060	791	606	479	388	320	270	230	198	172	152	134	119
			D	.07	.11	.15	.20	.25	.32	.38	.44	.52	.60	.68	.77	.90	1.00
FN-10	St. bars 2″ x⅛″	10.3	Load	1410	986	722	552	438	352	294	247	209	181	158	138	122	109
			D	.07	.10	.14	.18	.23	.29	.34	.41	.48	.56	.64	.72	.81	.92
FN-11	St. bars 2″ x3/16″	13.9	Load	2020	1408	1030	786	623	502	418	352	298	257	225	196	174	156
			D	.07	.10	.13	.17	.22	.28	.33	.39	.46	.54	.61	.68	.78	.88
FN-12	St. bars 2¼″x⅛″	11.4	Load	1795	1252	918	702	556	449	372	313	266	229	200	175	155	139
			D	.06	.09	.12	.16	.20	.24	.29	.35	.42	.49	.56	.63	.71	.81
FN-13	St. bars 2¼″x3/16″	15.4	Load	2550	1750	1307	1000	792	641	529	446	378	326	285	250	221	197
			D	.06	.09	.12	.15	.19	.23	.28	.33	.40	.47	.54	.61	.68	.77

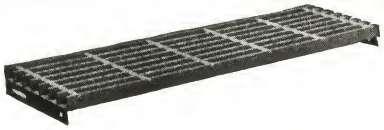
Kerlow Standard Safety Steps

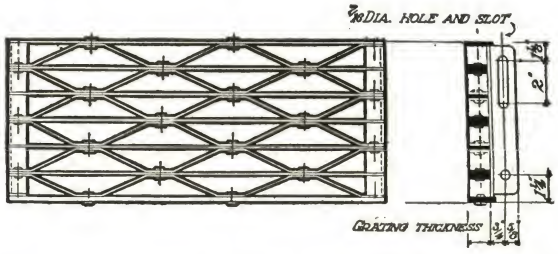
Made in any length. Measure inside of stringers.

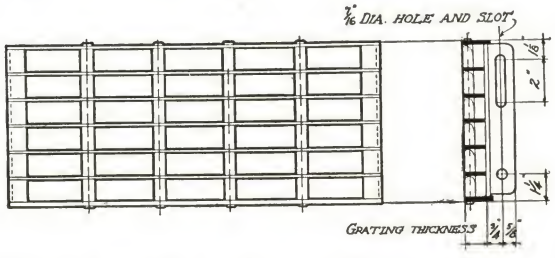
Steps come complete ready to bolt to stringers, with Kerlow patented carriers.

Type VN Grating—Standard step widths (for grating having ⅛-in. thick bearing bars) 5⅜, 6⅝, 7⅞, 9⅛, 10⅜ and 11⅝ in. Standard step widths (for grating having $\frac{3}{16}$-in. thick bearing bars) 5⅝, $6\frac{13}{16}$, 8¼, $9\frac{9}{16}$ and 10⅞ in.

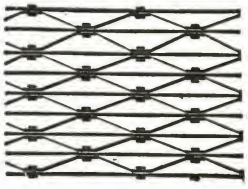
Type FN Grating—Standard step widths (for grating having ⅛-in. thick bearing bars) 5⅜, 6⅝, 7⅞, 9⅛, 10⅜ and 11⅝ in. Standard step widths (for grating having $\frac{3}{16}$-in. thick bearing bars) 5⅝, $6\frac{13}{16}$, 8¼, $9\frac{9}{16}$ and 10⅞ in.



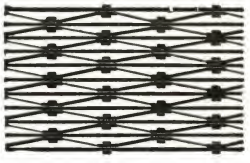




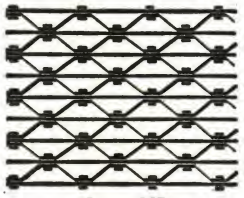
Other Standard Series V Grating Flooring and Their Specifications



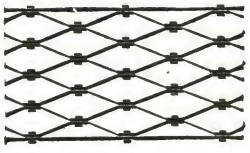
Type V
A standard reticulated mesh for all floors and safety steps. Reticulated bars full depth. Maximum opening between bars 1 in. Rivets 6.75 in. on centers. Uniform safe loads higher than Type VN



Type VE
A close bearing bar reticulated type. For special floors and safety steps. Reticulated bars full depth. Maximum opening between bars ¾ in. Rivets 6.75 in. on centers. Uniform safe loads higher than for Type V



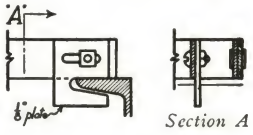
Type VR
A close reticulated mesh type for special floors and safety steps. Reticulated bars full depth. Maximum opening between bars 1 in. Rivets 4 in. on centers. Uniform safe loads higher than for Type VN



Type VL
Open mesh for special conditions. All bars equal depth. Maximum opening between bars 2 in. All rivets ¼-in. diam.—6¾ in. on center

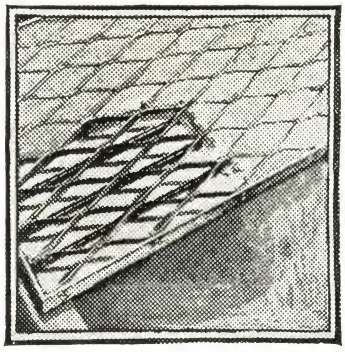
Kerlow Adjustable Fasteners

Specify the Kerlow "H" Fastener which securely holds the gratings to the supports.



Section A

Kerlow Floor and Bridge Slabs



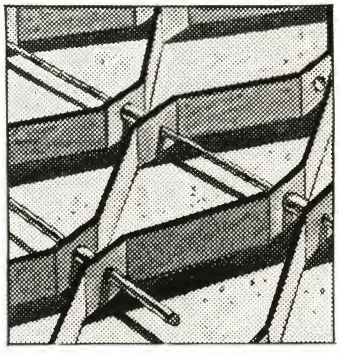
Kerlow Slabs designed for equivalent live loads will reduce bridge and factory floor dead loads 50 to 60 per cent.

The wearing surfaces of Kerlow Slabs will outlast the ordinary concrete, composition or block surfaces.

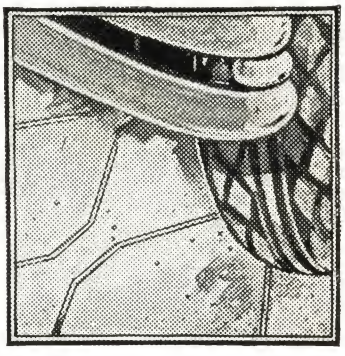
Kerlow Floor or Bridge Slabs are rugged, heavy duty, pre-armored floor units, shipped precast or arranged for field pouring. Used for industrial floors, highways, bridge roadbeds, sidewalks and tunnel roads. They are strong, long-lived and economical. *No forms are required.* The design is flexible and can be changed as to width, length and thickness. The slabs, when installed, will carry the hand trucks while pouring the cement.

Recommendations and prices submitted upon receipt of plans or requirements.

Kerlow Floor and Highway Armoring



The increasing demands of highways and industrial traffic have made the use of Kerlow Steel Floor Armoring, as created and developed by Kerlow, an absolute necessity. There is a series, a type, and a strength of Kerlow Steel Floor Armoring for every conceivable floor or highway requirement. Type K-A shown here, is manufactured in convenient size units and thicknesses in accordance with traffic conditions. These units can be easily and quickly laid without tools, for segmental or continuous arrangement as desired, forming a one-piece protective steel armor all over, flush with the traffic surface. Saves costly repairs and maintenance.



Specify Armor by Kerlow.

WILLIAM F. KLEMP COMPANY, INC.

Manufacturers of Grating, Stair Treads and Hexteel Surface Armor

TELEPHONE
Hemlock 5300-1

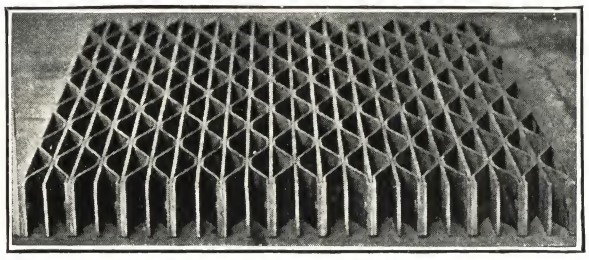
6624-6638 South Melvina Avenue, CHICAGO, ILL.

AGENTS IN LEADING CITIES

Diamond Grating

The highest quality "Machine-Made," Diamond Grating eliminates the uncertainties of the human element.

Materials—Made from flat, mild rolled steel bars ranging in size from ¾ to 3 in. in width, and ⅛ and $\frac{3}{16}$ in. in thickness.



End View of Diamond Grating 2¾ Inches in Depth

Construction

Securely constructed by riveting together alternate straight and bent bars of equal depth making the grating reversible. The specially designed dies used in forming the bent bar make a long and perfect bearing at all riveted points. The $\frac{17}{64}$-in. holes punched in the neutral axis of both bent and straight bars leave a $\frac{1}{64}$-in. clearance for ¼-in. rivets. These are equally set up by machine, making a solid unit of unusual strength, built upon the truss principle—permanently rigid. Our method prevents inaccurate punching of rivet holes which often distorts the rivets.

No Loose Ends—Each piece of Diamond Grating is so constructed, regardless of its length, that all bars are flattened out and riveted at the ends.

Diamond Grating for Floors

Made up from the engineer's drawing to proper sizes for individual requirements.

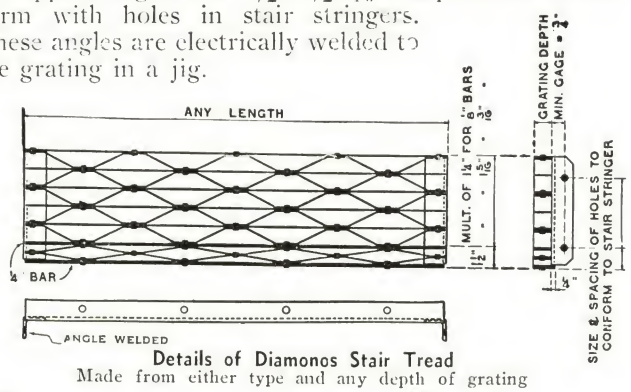
Cutouts made, where necessary to fit around pipes, columns, etc., insuring a perfect and complete job.

Diamonos Stair Treads

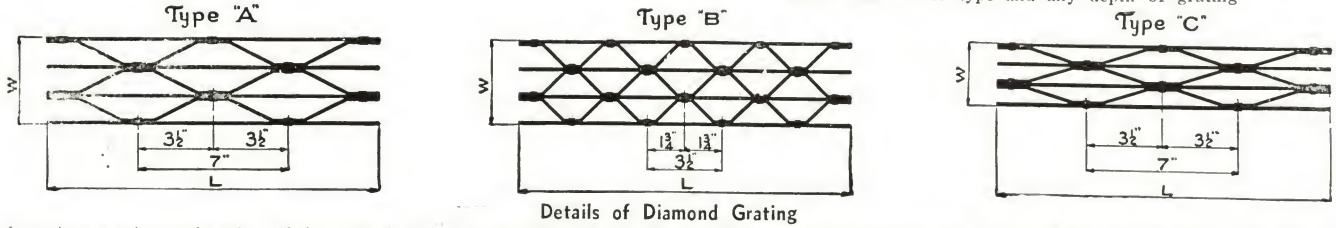
Meet the requirements of the most exacting engineers. Same high standard of quality as in Diamond Grating.

Nosing—Two ¼-in. bars spaced 1½ in. center to center. These are separated by ⅛ in. bent bars to form a diamond, and are machine riveted. The outside or toe bar is ¼ in. deeper than the grating in tread, while the second ¼-in. bar is same depth as grating.

Support angles are 1½x1½x$\frac{3}{16}$ in., punched to conform with holes in stair stringers. These angles are electrically welded to the grating in a jig.



Details of Diamonos Stair Tread
Made from either type and any depth of grating



Details of Diamond Grating

L varies to suit any length. W for type A and B in multiples of 1¼ in. for ⅛-in. straight bars and $1\frac{5}{16}$ in. for $\frac{3}{16}$-in. straight bars. For type C ⅞ in. for ⅛-in. straight bars, $\frac{13}{16}$ in. for $\frac{3}{16}$-in. straight bars, plus thickness end bar and rivet heads

KLEMP HEXTEEL SURFACE ARMOR

Economical per foot, labor and maintenance. Rigid because it is continuous in all directions.

Used for—Floors, platforms, docks, ramps, drives, aisles, R. R. crossings, bridge approaches, decks and all heavy duty surfaces.

Prevents all cracking, ruts and pot holes, maintaining a smooth surface indefinitely. The hex shape keeps any load on steel at all times.

Hexteel the Surface and Eliminate Further Maintenance

Construction—Hexteel Surface Armor is made of 14-gauge or ⅛ in. thick steel in depths of ¾, 1 or 1¼ in. with hexagonal openings 1¾ in. and made in standard slabs 3x10 ft. (lesser widths if desired).

Each slab connects at sides and ends—easily clinched together.

Samples, prices and further information on request.

THE TRI-LOK COMPANY

Tri-Lok Ventilated Steel Flooring, Concrete Armoring and Safety Steps

PITTSBURGH, PA.

NATIONAL DISTRIBUTORS

DRAVO-DOYLE COMPANY

Dravo Building, PITTSBURGH, PA.

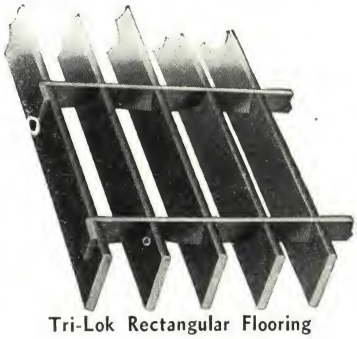
Products

TRI-LOK OPEN STEEL FLOORING in rectangular, diagonal, *Super-safety* U-type and radial designs; TRI-LOK SAFETY STEPS made with either rectangular, diagonal or *Super-safety* U-type flooring; TRI-LOK CONCRETE ARMORING and TRI-ARMO; T-TRI-LOK—self-supporting heavy duty flooring.

Construction

Only two parts are used—bearing bars which carry the load and have curved slots punched above the neutral axis, and cross bars pressed into these slots to distribute the load. In assembling, the bearing bars are set on edge with the slots uppermost and with these slots in adjacent bars curving alternately in opposite directions. Each bar is held in a rigid steel frame, insuring perfect alignment. Cross bars of the same depth and width as the bearing bar slots are then forced into these slots under a 1600-ton press. This completes the triple twist and turn lock, and the enormous pressure insures a perfectly smooth floor.

Tri-Lok Super-Safety U-Type Flooring



Tri-Lok Rectangular Flooring

Advantages

No rivets, bolts or welds are required, thus eliminating the possibility of loose or defective joints. Laboratory tests have proved that the Tri-Lok joint remains unimpaired beyond the yield point, and is therefore stronger than the steel itself.

Tri-Lok joints have no acute angles or rivet heads to collect refuse and moisture, and consequently do not rust out.

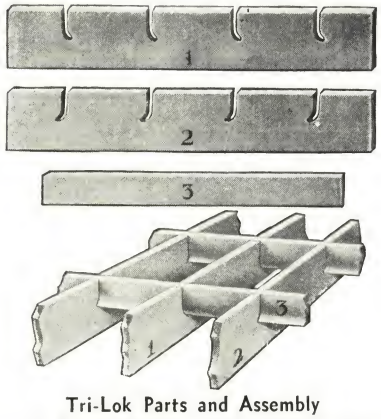
The rigid lock at the joint permits the cross bars to act also as cross braces, giving perfect distribution of a concentrated load over a wide panel.

Tri-Lok panel size, 2 to 3 ft. wide, reduces installation costs to a minimum.

Tri-Lok rectangular flooring is approximately 90% open, and remains so, an advantage in illumination and ventilation.

Tri-Lok Concrete Armoring and Tri-Armo

Tri-Lok Armoring—Tri-Lok flooring panels with bearing and cross bars projected to give a staggered effect, thereby interlocking with adjoining panels. The panels are treated with a hot lye wash to eliminate grease and provide complete adhesion with the concrete. After concrete or other surface material is poured, the armoring panels are placed side by side and sunk flush with the surface by walking over or tamping, resulting in minimum installation time and cost. No fasteners are required since the twist of the cross bars provides a positive anchor.



Tri-Lok Parts and Assembly

(1) Bearing bars slotted for friction lock in one direction.
(2) Alternate bearing bars slotted for friction lock in opposite direction.
(3) Cross bars locked by twist in both directions under enormous hydraulic pressure

A wide variety of bar spacing can be furnished. All wear and impact is absorbed by the steel bars and cracks cannot pass from one rectangle to another. The surface is smooth and at the same time slipless because of the square edges of the steel bars.

Tri-Armo—An armoring of loose bars designed for field assembly. It can be furnished at a price below Tri-Lok Armoring.

T-Tri-Lok

T-Tri-Lok, a self-supporting concrete armoring, is manufactured in sizes up to 2 ins. in thickness by THE TRI-LOK COMPANY, and distributed by Dravo-Doyle Company. The larger sizes are manufactured and sold by the Carnegie Steel Company, subsidiary of U. S. Steel Corporation. T-Tri-Lok is manufactured exactly the same as other Tri-Lok products, except that the main bearing bars are tees, instead of flat bars.

Tri-Lok Radial Flooring

Tri-Lok Diagonal Flooring

In the smaller sizes, T-Tri-Lok panels filled with concrete provide an ideal construction for heavy duty factory floors, balconies, loading platforms, bridge sidewalks, solid steps, etc. T-Tri-Lok is unsurpassed for strength, wearing qualities and lightness. The dead load is only one-fourth to one-third that of the ordinary floor construction, making possible a large saving in the supporting members.

Tri-Lok Safety Steps

The Tri-Lok Safety Step consists of a panel of rectangular, diagonal or *Super-safety* U-type Tri-Lok Flooring, of any desired width, length, depth, and bar spacing, provided with a nosing bar and carriers attached at each end. These carriers have holes for bolting to the stringers, so that each step is complete, ready for installation. Kick plates or risers can be attached to the back of the step when desired. Being made from Tri-Lok Flooring, it has all the advantages resulting from the Tri-Lok Joint.

The Tri-Lok Safety Step is slipless, has a visible edge, is perfectly clogless, preventing the accumulation of rust and dirt, and is exceptionally strong.

Tri-Lok Continuity Bar

The Tri-Lok Continuity Bar consists of an angle threaded transversely through the bearing bars of adjacent sections of flooring, producing one continuous span, and resulting in a perfectly smooth floor, distribution of concentrated loads between adjoining panels, greater rigidity, and less need for weight in the supports.

AMERICAN PRESSED STEEL CO.

Diamond Pattern Rolled Steel Floor Plates

Commercial Trust Building, PHILADELPHIA, PA.

AGENTS AND WAREHOUSE STOCKS IN VARIOUS CITIES

"The Original Floor Plate with Raised Diamonds"

NEVERSLIP floor plates are rolled from open hearth steel in two patterns—raised diamond pattern and straight corrugated (ribbed) pattern—under the original Linden patents. NEVERSLIP floor plates have been in use over 30 years.

Widely used for floors and stairways in buildings, boiler and engine rooms, powerhouses, factories and ships, also on bridges, fire escapes, cellar doors, trench covers, etc., where structural strength combined with lightness is required for a safe and durable surface.

NEVERSLIP floor plates are furnished in thickness ⅛ to ¾ in. Also especially light NEVERSLIP plates can be furnished Nos. 12 and 14 gauge. In these light plates the pattern is one-half the size of that on the standard pattern plate.

Catalogue and samples on request.

TRADE MARK

NEVERSLIP

The Floor Plate with "Perfect Diamonds"

Non-slipping and Durable

The raised diamonds of NEVERSLIP floor plates are high and have four square edges.

The surface of the diamonds is approximately flat, providing an even non-slipping surface with maximum wear.

The corrugated pattern also has straight square edges which likewise provide safety and durability.

NEVERSLIP floor plates have no pockets which will permit accumulation of dirt and water and they can be readily cleaned.

Great Structural Strength

NEVERSLIP floor plates have a tensile strength of 55,000 to 70,000 lb., an elastic limit of about 30,000 lb. and a reduction of area or percentage of ductility of 40% to 60%.

Application

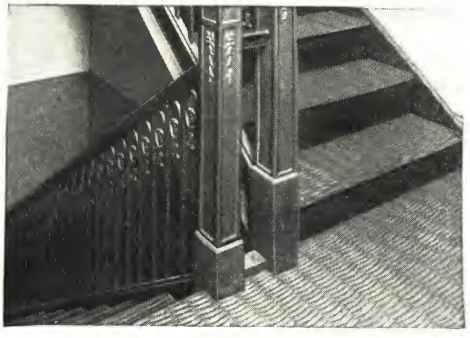
On wood floors or planking plates are fastened by lag screws or by ordinary wood screws (occasionally by carriage bolt with lock nuts and washers). On steel work, stairways, etc., by bolting through the supporting members. On new concrete floors, stairways, etc., arrangements should be made to lay floor plates flush, secured to screw anchors, to expansion bolts, or to wood blocks set flush in the concrete.

Protection for Bridge Flooring

The placing of two lanes of floor plates 24 in. wide, spaced normal gauge of vehicles for the entire length of the bridge directly over the planking, eliminates maintenance cost in reflooring and strengthens the entire bridge. The floor plates overcome vibration, chatter, rising spikes and planks so dangerous to automobile traffic.

Trench Cover and Ladder

Bridge Traffic Lane

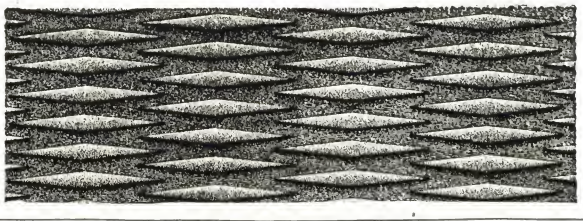


Tread and Walkway

STANDARD PATTERNS, SIZES AND WEIGHTS NEVERSLIP ROLLED STEEL FLOOR PLATES

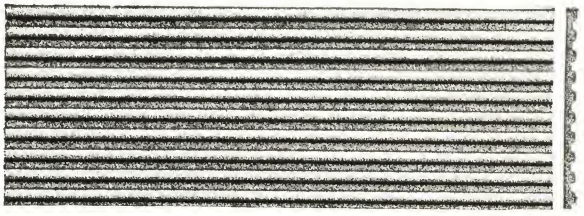
Notes: Larger and thicker plates can be furnished if desired. Thickness is measured through body of plate, exclusive of diamond or rib. Weights are approximate and vary according to size of plate.

Diamond Pattern



Thickness, in.	Width, in. 20	24	30	36	42	48	54	60	Weights per sq. ft., lb.
	Length, in.								
⅛	144	144	144	144	144	120	...	...	7.75
3/16	240	240	240	192	144	144	...	...	8.75
¼	240	240	240	240	240	192	180	144	11.25
5/16	240	240	240	240	240	192	192	144	13.75
⅜	240	240	240	240	240	192	192	144	16.25
7/16	240	240	240	240	240	192	192	144	19.00
½	240	240	240	240	192	192	144	144	21.50

Ribbed Pattern



Thickness, in.	Width, in 20	24	36	42	48	54	60	Weights per sq. ft., lb.
	Length, in.							
⅛	144	144	144	144	120	120	...	9.00
3/16	240	240	192	144	144	120	...	9.75
¼	240	240	240	240	192	180	144	12.25
5/16	240	240	240	240	240	192	180	14.75
⅜	240	240	240	240	192	192	180	17.25
7/16	240	240	240	240	192	180	144	20.00
½	240	240	240	240	192	160	144	22.50

TRUSCON STEEL COMPANY

Manufacturers of a Complete Line of Steel Building Products

YOUNGSTOWN, OHIO

Warehouses and Offices in All Principal Cities—For list, see our pages on Steel Windows

Products

SAFETY-TREAD STEEL PLATES; SAFETY-TREAD STEEL PLANKS; SAFETY-TREAD PAVING BLOCKS; also various products formed from this material.

For other Truscon products, see pages in this edition on Steel Windows, Steel Doors, Steeldeck Roofs, Steel Joists, Channelplate and Teegrid Floors, Reinforcing Steel, Complete Buildings and Metal Lath as listed in Manufacturers' Index.

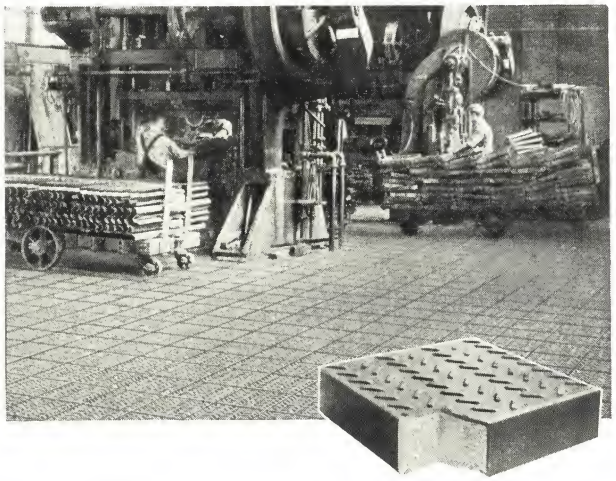
Catalogues and data sent on request.

TRUSCON SAFETY-TREAD STEEL PRODUCTS

General

Truscon Safety-Tread Steel is unique in that it offers a scientific design that insures maximum safety and at the same time is economical in cost. Due to the manufacturing process, the safety tread can be placed on the steel in the place where it actually is required, leaving the remaining area of the material plain. As a consequence, the application of Safety-Tread Steel has been broadened to include a wide variety of uses.

Truscon Safety-Tread Steel is effective in providing traction and anti-slip qualities in any direction, the design being accepted only after a comprehensive series of tests had been made which thoroughly demonstrated its superiority.



The herringbone pattern, approximately ⅛ in. thick, is developed by an exclusive process which makes the plates equal in strength to any similar steel on the market, very resistant to wear and light in weight.

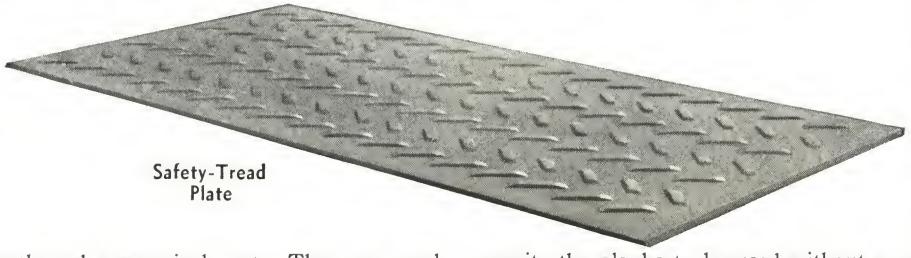
Safety-Tread Paving Blocks

Floors that are immune to the pounding of heavy loads on steel wheels or the impact of heavy objects can be built economically and easily with Truscon Safety-Tread Steel Paving Blocks. These blocks are 12 in. square, with a depth of 3 in. The surface presents the standard Safety-Tread, which is permanent and slip-proof, making the blocks excellent for use around machines doing heavy work or for aisles or platforms subjected to unusual traffic conditions. Installation is extremely simple, for, after the blocks are filled with concrete, they are laid like bricks, with each block covering a square foot of floor.

Truscon Safety-Tread Paving Blocks make an attractive floor that is easy to clean, sanitary, safe, permanent, fireproof and that will not splinter, chip, crack, burn, swell, shrink or bulge. The cost is considerably less than for probably any other type of floor having equal resistance to wear.

Safety-Tread Plates

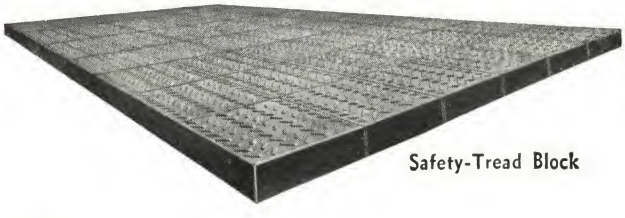
Safety-Tread Plates are available in practically any size, and they may easily be formed to any desired shapes. The tread may be an all-over pattern, or it may be placed only where required. Thicknesses varying from ⅛ to ¼ in. permit the use of the most economical weight for the particular job. These plates offer the finest anti-slip qualities, great strength and economical cost. They are used for floors, steps, cellar doors, circular stairs, cover plates, platforms, ramps, stair treads, and many other purposes. The tremendous facilities of the Truscon Pressed Steel Division are available for producing any desired special shapes or designs.



Safety-Tread Plate

Safety-Tread Planks

When desired, permanent, slip-proof floors may be constructed with Truscon Safety-Tread Planks, which present the same general advantages as the paving blocks. Planks made from ⅛-in. stock must be filled with concrete before laying, but the heavier weights have sufficient strength to support considerable loads. This permits the planks to be used without a subbase for such purposes as trench covers, platforms and bridge floors, where they are attached directly to the structural members by means of clips. The webs of the channels may be punched for bolting the members together, thus making a very efficient diaphragm that resists wind and torsional stresses.



Safety-Tread Block

Safety-Tread Plank

ACME STEEL COMPANY

Manufacturers of Acme Floor-Steel for Industrial Floors

2842 Archer Avenue, CHICAGO, ILL.

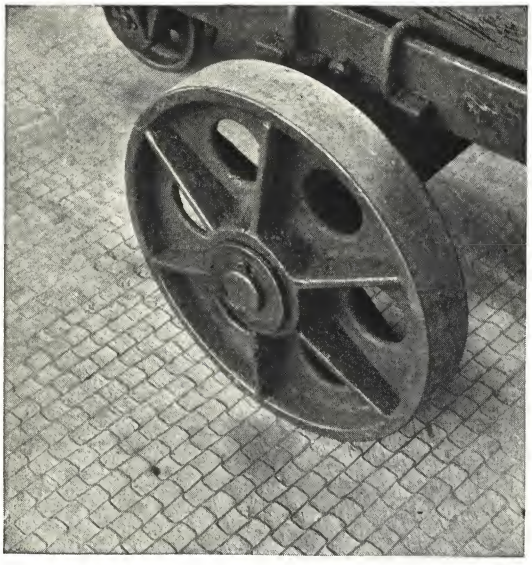
BRANCHES

BROOKLYN, N. Y., 219 36th Street
ATLANTA, GA., 603 Stewart Avenue, S. W.
NEW ORLEANS, LA., Masonic Temple Bldg.
MONTREAL, QUE., 365 St. Paul Street, W.
WINNIPEG, MAN., MacArthur Bldg.
TORONTO, ONT., 32 Front Street, W.
LOS ANGELES, CAL., 300 Avery Street
SAN FRANCISCO, CAL., 200 Davis Street
SEATTLE, WASH., 114 Railroad Avenue, S.

ACME FLOOR-STEEL

FOR LONG LIFE INDUSTRIAL FLOORS

(Patents Pending)



Acme Floor-Steel

Embedded flush with the top in concrete and asphalt floors, Acme Floor-Steel literally provides a network of steel rails for truck wheels. Two or more of these rails are at all times supporting each wheel, and are acting as walls which retain and knit together the filling material. Acme Floor-Steel bears the wear, absorbs the shocks, and provides maximum traction efficiency for starting and stopping of trucks.

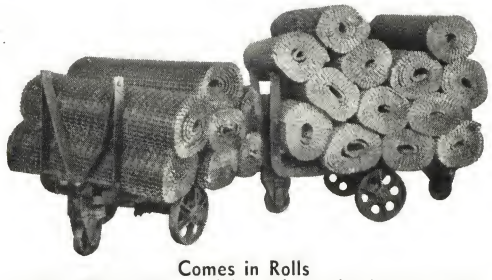
Acme Floor-Steel Advantages

(1) A flexible grid that is easy to lay.
(2) Presents a quiet, non-skid surface.
(3) The exposed steel edges bear the load.
(4) Cracks, holes and ruts cannot develop.
(5) Remains smooth and even through life.
(6) Maintenance is practically eliminated.

Description

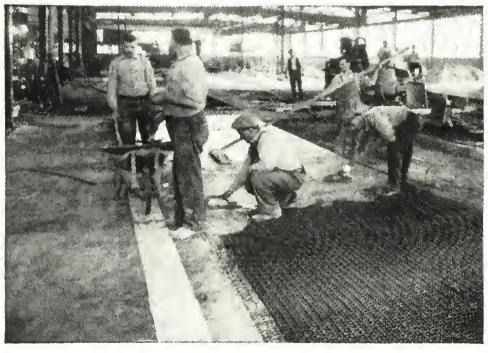
Acme Floor-Steel is for use in industrial plants of all kinds where floors are subjected to heavy traffic or rough treatment. It is used not only in laying new floors and driveways but also in repairing old floors, including wood. Acme Floor-Steel insures a quiet, even and non-skid surface throughout the greatly increased life of the floor. Cracks, holes and ruts cannot develop. Maintenance costs are greatly reduced.

Because it rolls out like a rug, Acme Floor-Steel may be laid in a fraction of the time required for many kinds of floor surface reinforcements. Once laid the whole floor mass cannot wear any faster than the tough steel itself. As truck wheels pound over Floor-Steel floors, the exposed edges of the steel become slightly mushroomed, and each section of concrete or mastic becomes riveted in as well as bound along all four sides.



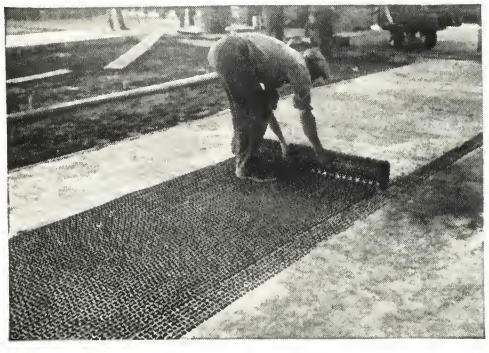
Comes in Rolls

Acme Floor-Steel is delivered on the job in easily handled rolls 47½ ins. wide, 25 ft. long, or in special widths where necessary, varying by units of 2½ ins. Size of mesh is 1¼x1¼ in.



Finishing

Putting the finishing touch to a floor in a large industrial plant. After three years of the most severe punishment from trucks carrying loads up to 20,000 lbs. this floor is giving as good service as the day it was laid



Left:

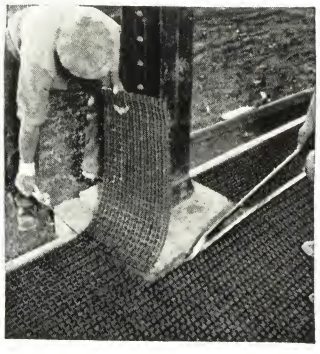
Laying

Concrete base course is laid in usual manner and struck off to ⅝ in. below finished floor line. Acme Floor-Steel is rolled out in 100 sq. ft. sections which are joined by pins and wires into one continuous mat. Filling material is then placed and troweled. As an alternative Floor-Steel may be pressed or tamped into surface after floor has been struck off at finish line.

Right:

Fitting

Fitting Acme Floor-Steel around an obstruction is easily and quickly done by cutting the steel on one side and pulling two wires



BLAW-KNOX COMPANY

Manufacturers of Floorgard—Steel Armoring for Concrete Floors and Pavements

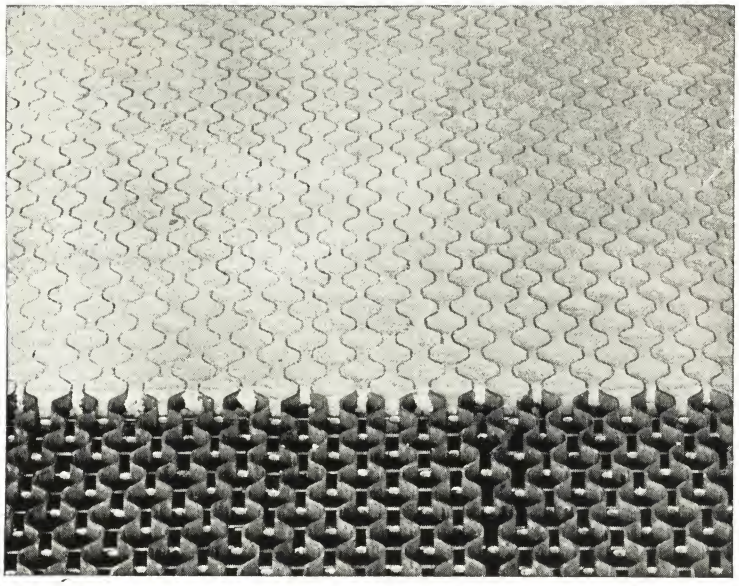
2074 Farmers Bank Building, PITTSBURGH, PA.

For Sales Offices, see Steel Roof Sheathing Page
For Other Products, see Manufacturers' Index

Floorgard—Steel Armoring for Concrete Floors and Pavements

Floorgard or Blaw-Knox floor armoring is a strengthening and protecting mat of steel mesh, put together easily, quickly and cheaply, without the use of tools, reinforcing the surface of the floor by taking the entire wear, and furnishing a really satisfactory surface which will last indefinitely.

Floorgard is made up of steel strips carefully formed into a regular pattern, which when placed together, form a series of separate rectangles of proper size to meet the conditions under which a given floor must work. These steel strips are set on edge as shown in accompanying illustrations. Small, short, circular tie rods are inserted in a horizontal position, through holes in the middle of the strips. These tie rods act as carrying members carrying one strip to another strip, as well as tying the entire structure into one steel mat.



Floorgard Partly Concreted—Used in Reflooring a Modern Factory

Floorgard Makes a Smooth and True Surface—An industrial floor armored with Blaw-Knox Floorgard has a smooth and true surface. The entire area of steel mesh is one unbroken unit, perfectly level at all points, making one of the strongest and best industrial floors ever developed.

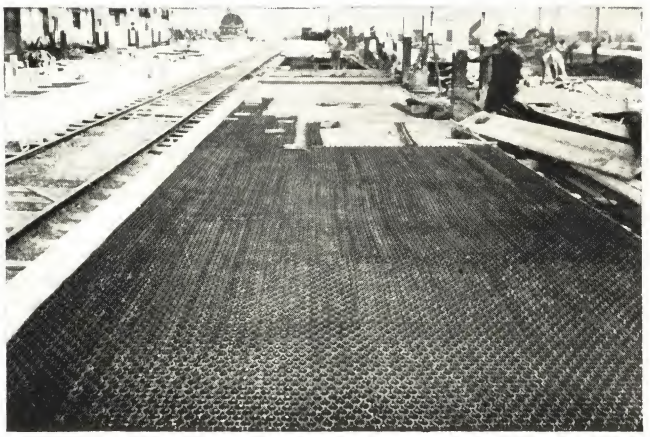
It must be realized that Blaw-Knox Floorgard is not a system for reinforcing concrete, but is actually a means for making a floor having all the wearing qualities of steel, plus the smoothness, elasticity, resiliency and foot ease of softer materials. Here we have a floor laid out in steel squares, but so arranged that pressure or impact applied to one square is transmitted to all surrounding parts of the floor. There is no question of individual weakness or of little individual blocks of concrete in any part of a Blaw-Knox Floor, because when the Floorgard is filled, the floor is monolithic in character and each square or rectangle is part and parcel of the entire floor body. In addition, the concrete is reinforced and securely anchored to the armoring by the horizontal rods passing through the steel strips.

No Tools—No Drawings Required—The construction is of such a nature that it can be formed to meet any possible floor requirement. It will be noted in the illustration that there are small steel lugs between adjacent strips of Floorgard at the points where the tie rods go through the steel strips. These lugs act as anchors to keep the steel strips in the plastic material, and also as separators between the strips avoiding any possibility of rust due to contact of steel. There are no acute angles to cause the formation of thin, easily broken fins of concrete.

Pavegard (Flooring for Pavements)

Pavegard is another name identifying Blaw-Knox steel armoring with its use in connection with strengthening roads, streets, alleys, courtyards, bridges, bridge approaches and other forms of pavement which are ordinarily subject to extremely heavy wear.

Typical Blaw-Knox Floorgard Installation



Blaw-Knox Floorgard—Steel Backbone

SNEAD & COMPANY

FOUNDED IN 1849

Self-anchoring ArmorGrids for Concrete and Asphalt Floors (Snead Patents)

TELEPHONE
MOntgomery 5-6200

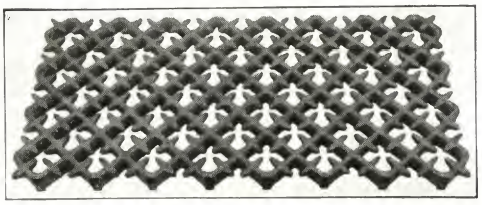
92 Pine Street
JERSEY CITY, N. J.

CABLE ADDRESS
"Sneadco, Jersey City"

Product

SNEAD SELF-ANCHORING ARMORGRIDS for FLOORS.

For our pages on Library Bookstacks, Shelving and Steel Partitions, see Manufacturers' Index.



No. 20 General Purpose Armor

Snead ArmorGrids Produce an Enduring Floor

For 19 years, Snead ArmorGrids have been subjected to the constant pounding and grinding of heavy trucks, rolling barrels, dropped castings, and other severe service, and they have stood the test without a break—without working loose. *Not a single installation of Snead ArmorGrids has ever had to be renewed.*

Snead ArmorGrids eliminate all expensive floor repairs with attendant production delays.

They are made of a fine grade of acid and rust resisting gray iron, and designed for rolling or sliding traffic in any direction.

Without anchoring or fastening devices, Snead ArmorGrids bond perfectly with the floor mass, keeping asphalt from flowing, and preventing spalling and dusting of concrete.

Pedestals projecting below each grid raise the ribs off the base slab, permitting the finish grout to flow under the ribs and interconnect all pockets.

Snead ArmorGrids distribute heat strains, carry the load and absorb the shocks. They present a smooth-running, yet non-slippery surface that lasts indefinitely.

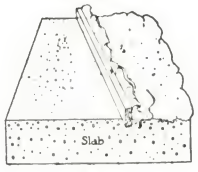
Where Snead ArmorGrids Are Used

For railroad terminals, warehouses, paper mills, publishing houses, repair shops and service stations, dairies, foundries and industrial plants of every type; for platforms, driveways, receiving and heavy storage areas, traffic aisles, ramps, and for spaces around machines, furnaces, vats and elevators; in old buildings for all floor repair work.

Permanent Repair for Wood Floors—ArmorGrids in asphalt make an extremely satisfactory and permanent repair for wood floors.

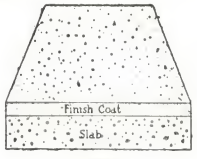
Note: Any grid can be shaped for odd-dimensioned areas, drains, etc., with a hack saw, cold chisel and hammer.

How to Install in Concrete



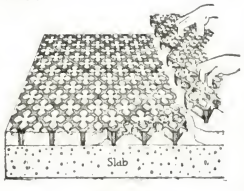
First

Screed off slab to true level surface, exact depth of grid below finished floor level



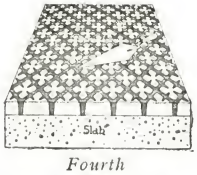
Second

When slab or leveling coat has partially set, flow on surface coat of rich 1:2 mix made with fine sharp sand



Third

Press grids into surface coat matching pattern and allowing ⅛-in. clearance between grids. Bottom grids firmly on slab



Fourth

Screed off excess grout, float in thoroughly to fill all voids and trowel smooth. Finished grout should be flush with, or about ⅛ in. higher than, top surface of grid

A Few of Many Satisfied Users

Railroads, Public Service, etc.
Brooklyn-Manhattan Transit Co.
Brooklyn Union Gas Co.
N. Y. Central R. R.
Pennsylvania Hotel (Service Dept.)
Pennsylvania R. R.
U. S. Government Post Office, New York, N. Y.

Automobile Manufacturers
Buick Motor Car Co.
Durant Motor Co.
Ford Motor Co.
Mack International Motor Co.
Pierce Arrow Motor Car Co.

Chemical Industries
Colgate & Co.
Electric Storage Battery Co.
Solvay Process Co.
Viscose Company

Dairies and Cold Storage Plants
Borden's Farm Products Co.
Brooklyn Bridge Freezing & Cold Storage Co.
Brown-Bailey Condensed Milk Co.
Collar City Creamery Co.
Consumers Dairy Co.
Dairymen's League Co-operative Association
J. M. Horton Ice Cream Co.
Janssen Dairy Co.
Keystone Dairy Co.
Merchants Refrigerating Co.
National Cold Storage Co.
M. H. Renken Dairy Co.
Sheffield Farms Co.
Walker Gordon Laboratories
Reid Ice Cream Co.

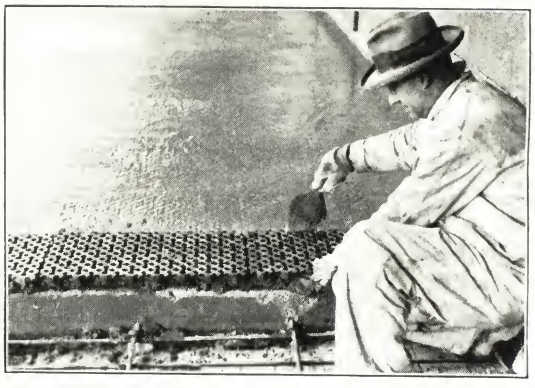
Rubber Products
B. F. Goodrich Rubber Co.
Goodyear Rubber Insulating Co.
Manhattan Rubber Co.

Food Products
Armour & Co.
Corn Products Refining Co.
Fleischmann Co.
General Baking Co.
C. F. Mueller (Macaroni)
Runkel Bros.
Schaeffer Brewing Co.
Wm. Wrigley, Jr.

Hardware and Metal Products
American Cable Co.
American Can Co.
American Hardware Corp.
Brown & Sharpe Mfg. Co.
Continental Can Co.
General Electric Co.
Hyatt Roller Bearing Co.
Irvington Smelting & Refining Co.
Lehmaier, Schwartz & Co.
National Lead Co.
Rundle Mfg. Co.
A. Schrader's Sons, Inc.
U. S. Government Mint
Yale & Towne Mfg. Co.

Paper, Printing, Publishing
Art Gravure Corporation
Detroit Sulphite Pulp & Paper Co.
Doubleday, Page & Co.
Nelson Doubleday, Inc.
New York World Telegram
Oxford Paper Co.
West Va. Pulp & Paper Co.

Warehouses, etc.
Frederick Loeser & Co.
H. W. Johns-Manville Co.



Over 33,000 Sq. Ft. No. 20 Snead AmorGrids Installed for the Merchants Refrigerating Co.

CHAS. R. HEDDEN CO., Newark, N. J., and WHITE CONSTR. CO., New York, N. Y. Contractors

After testing many floor materials, this Company, one of the largest refrigerating companies in the country, selected Snead Grid protection for all its plants in Newark and Jersey City, N. J., as the most economical per foot per year. Above shows installation on its railroad platform

DIMENSIONS, WEIGHTS AND DISPLACEMENT

Grid No.	Length, in.	Width, in.	Area, sq. ft.	Effective armor, per cent total area	Openings, in.	Rib depth, in.	Over-all depth, in.	Rib thickness, surface, in.	Rib spacing, c. to c., in.	Weight approx., lb.	Finished floor aggregate displaced, per cent
10 Lightweight	24	12	2	41	¾	½	⅝	¼	2⅛	10	21
20 General purpose	24	12	2	41	¾	1	1¼	¼	2⅛	20	21
30 Heavy duty	24	12	2	41	1	1¼	1¾	⅜	2⅞	30	21

ABRASIVE FACED METALS FOR SAFE WALKWAYS

Trade Names Are Registered in the U.S. Patent Office

AMERICAN ABRASIVE METALS CO.

50 CHURCH STREET NEW YORK, N. Y.

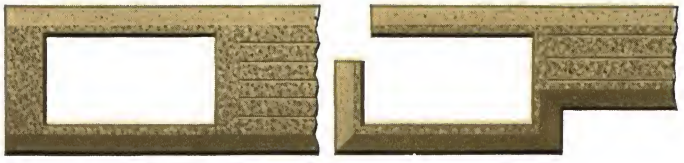
ELEVATOR DOOR SILLS

Nicalun Elevator Sills in Lobby of City Bank Farmers Trust Building, New York, N. Y.
The silver white color harmonizes most effectively with the general architectural scheme.

Nicalun, where a white metal saddle is indicated; and Bronzalun, where a rich bronze color is desired, for both elevator sills and swing door thresholds, are finding ever-increasing acceptance. They combine to a high degree architectural beauty with extreme durability and anti-slip effectiveness.

Nicalun—Style V—Two Speed Door

SWING DOOR SADDLES



Type 12 Type 15

Bronzalun—Style T—with Cut Out for Rixson Hinge

Two types of swing door saddles with cut outs for Rixson hinges are illustrated above. Their use for main entrance and interior swing doors, either in Bronzalun or Nicalun, will harmonize appropriately with the highest type and quality of trim.

AMERICAN ABRASIVE METALS CO.

50 Church Street, NEW YORK, N. Y.

BOSTON, MASS. CHICAGO, ILL. PITTSBURGH, PA. PHILADELPHIA, PA. SAN FRANCISCO, CALIF.

ANTI-SLIP WALKWAYS

Products

Abrasive-faced, anti-slip castings of iron, bronze, aluminum and nickel alloy manufactured and sold under the trade names of Feralun, Bronzalun, Alumalun and Nicalun, respectively, for walkway surfaces.

Composition

Feralun, Bronzalun, Alumalun and Nicalun are castings of the metal indicated in which is embedded the hardest known electric furnace abrasive. These abrasive grains are concentrated on and completely protect the wearing surface of the casting.

An examination of an unpainted casting under a magnifying glass will bring out immediately the uniformity of the coverage and the completeness and permanency of the bond between the abrasive grain and the metal matrix.

Application

There is need for abrasive-faced anti-slip castings wherever a slippery or worn walkway surface would cause a hazard. Our products are recommended for stair treads and landings, elevator sills and swing door saddles, freight elevator landings, ramps, drainage gratings, coalhole covers and sidewalk doors, floor plates around moving machinery and where truck traffic is encountered.

Whether the abrasive-faced casting selected for any particular installation shall be Feralun, Bronzalun, Alumalun or Nicalun depends on the architectural effects sought, together, in the case of Alumalun, with the advantage of light weight and resistance to salt water corrosion.

Safety

The electric furnace abrasive which is embedded in the wearing surface of every abrasive-faced casting manufactured by the AMERICAN ABRASIVE METALS CO. projects slightly above the face of the casting. This abrasive "bites." It thus provides an excellent frictional surface so that slipping is impossible. This is true not only when the surface is dry but also when it is covered with oil or water. In the latter cases the action of the opposite contact surface, whether shoe sole, truck wheel, or whatever, is to squeeze out the liquid under it, eliminating the lubricating film and permitting the projecting abrasive grains to function with unimpaired efficiency.

Every stair tread manufactured by the AMERICAN ABRASIVE METALS CO. carries the protective abrasive grains over the nosing edge, *a feature which is of primary importance.* The nosing receives the hardest wear to which the tread is subjected and slippery or jagged nosings are responsible for a very large proportion of falls on stairs.

Durability

The covering of abrasive grains which provides the anti-slip properties of Feralun, Bronzalun, Alumalun and Nicalun also accounts for the extreme durability of these materials. The abrasive grains, which are only slightly less hard than the diamond, receive the wear to which the surface of the casting is subjected. Securely anchored by patented casting processes, developed and constantly perfected during more than twenty years of successful manufacture, these grains will not wear loose but will remain firmly embedded in the casting retaining their efficiency after many millions of contacts. Feralun, Bronzalun, Alumalun and Nicalun are highly weather resistant even when placed in exposed positions.

Details

Details of the more common type of abrasive-faced castings produced by the AMERICAN ABRASIVE METALS CO. are shown on later pages. Other designs are furnished when desired. Being foundry castings it is possible for this Company to furnish materials of its manufacture in any size or style consistent with good foundry practice. The type of surface, whether hatch, plain or fluted, depends on the choice of the individual responsible for the installation.

Appearance

Feralun gives an effect of ruggedness and serviceability that is lacking in other materials, such as slate, concrete or ordinary iron castings. This is particularly apparent after an installation has been in use for some time. Feralun has carried approximately 14,000,000 people on a tread 30 ins. wide before its anti-slip effectiveness was impaired to any degree.

Where architectural requirements call for a rich bronze to harmonize with black, bronze or gold trim the color of Bronzalun will be found fully in keeping with the decorative scheme, and as long lived as Feralun. Nicalun or Alumalun will be equally serviceable for use with marble or white metal surroundings.

FERALUN

BRONZALUN

Falls are exceeded only by motor vehicles as a cause of serious accidents. More than half of the casualties resulting from falls are caused by slipping and tripping on unsafe stairs and walkways. Such accidents are preventable. The importance of proper materials and design as a means of minimizing this tremendous human and economic waste cannot be overemphasized.

NICALUN

ALUMALUN

LARGEST METROPOLITAN BUILDINGS CONTAIN AMERICAN ABRASIVE PRODUCTS

Buildings in Downtown New York Equipped with American Abrasive Anti-slip Walking Surfaces © Wm. Frange

(1) City Bank Farmers' Trust—59 stories; 750 ft. high
(2) Irving Trust—51 stories; 638 ft. high
(3) Bank of Manhattan—70 stories; 927 ft. high
(4) Cities Service—67 stories; 950 ft. high
(5) Singer—45 stories; 612 ft. high
(6) American Telephone & Telegraph—27 stories; 422 ft. high
(7) Transportation—42 stories; 520 ft. high
(8) Woolworth—55 stories; 767 ft. high

Buildings in Midtown New York Equipped with American Abrasive Anti-slip Walking Surfaces © Wm. Frange

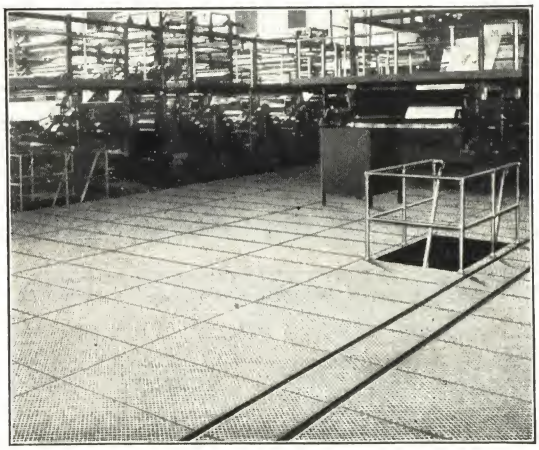
(1) Empire State—86 stories; 1250 ft. high
(2) 10 East 40th Street—48 stories; 700 ft. high
(3) 500 Fifth Avenue—58 stories; 699 ft. high
(4) Lincoln—53 stories; 673 ft. high
(5) Chanin—54 stories; 623 ft. high
(6) New York Central—34 stories; 565 ft. high
(7) Chrysler—77 stories; 1046 ft. high
(8) R.C.A. Victor—50 stories; 616 ft. high
(9) Daily News—35 stories; 476 ft. high

The illustrations on this page show practically all of the tallest buildings in the City of New York, most of which contain the products of the AMERICAN ABRASIVE METALS Co.

It is interesting to note that the 15 tallest buildings in New York contain American Abrasive Products, as do 66 out of the 89 skyscrapers of 30 or more stories.

In the City of Philadelphia the company holds a similar record, in that 33 of the 40 largest buildings erected within the past four years contain American Abrasive Products.

These records conclusively prove that Feralun, Bronzalun, Alumalun and Nicalun are being specified constantly by architects of prominence for elevator sills, swing door thresholds, stair treads and landings, trench covers, coal-hole covers, drainage gratings, etc.



Press Room Floor, New York Times, Brooklyn Plant

FERALUN ANTI-SLIP TREADS FOR NEW AND OLD WORK

Feralun Anti-slip Structural Treads

For schools, office buildings, lofts, warehouses, power plants, factories and other industrial buildings, Feralun Structural Treads, either with or without risers, offer decided advantages over many other types of stair construction.

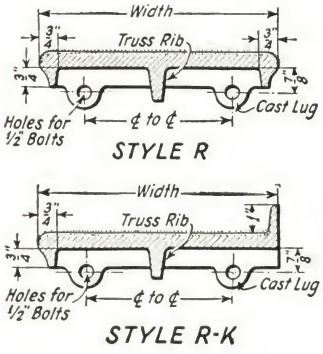
They are safe, durable, economical, easy to install and pleasing in appearance.

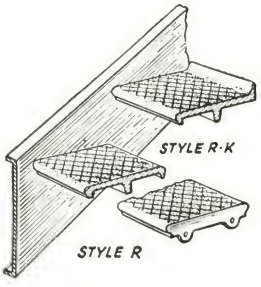
They eliminate the necessity for steel pans and subtreads.

Stairs designed to eliminate the use of concrete provide access to upper stories immediately upon installation.

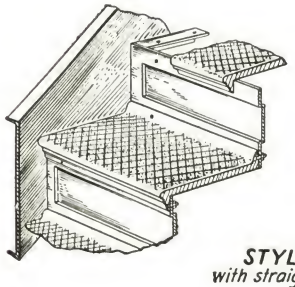
There are no annoying delays waiting for concrete to dry.

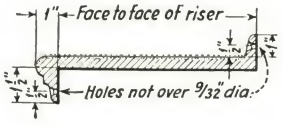
Feralun structural treads have received the approval of architects, engineers, and contractors throughout the country.





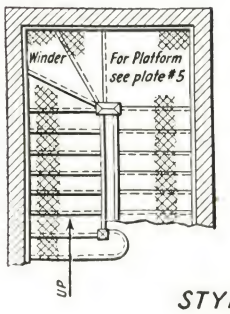
STYLES R & R-K
with cast lugs for bolting treads direct to stringers

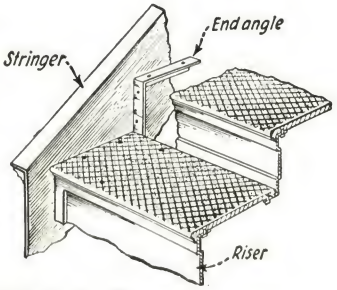




Note:
Thicknesses as on plate #4 but minimum is 7/16

STYLE K
with straight risers





STYLES O & S
with bent risers

Feralun Anti-slip Spiral Stairs

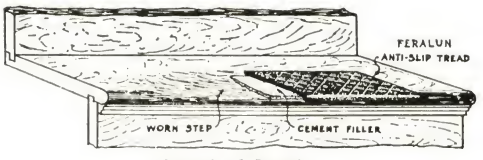
For locations where saving of floor space is essential, Feralun Spiral Treads and Platforms make an ideal installation. They are cast complete in one piece with collar and flange according to details. The riser of each tread rests on the tread of the step below. They are economical, easy to assemble and erect, and are neat in appearance. In addition, they provide maximum safety in a location where falls are likely to result in severe injury.

Spiral Staircase with Feralun Treads
For details, see page 8, plate 6

Repair of Worn Stairs

Worn stairs of wood, terrazzo, marble, slate or other materials can be made safe and greatly improved in appearance by the use of the appropriate abrasive metal castings, Feralun, Bronzalun, Alumalun or Nicalun, at a cost for material and installation that is surprisingly low. Cast in any size or shape desired.

Treads for repair work are furnished with a deep lip to cover worn depressions and irregularities in the old steps, and with beveled back and ends when the full surface of existing tread is not to be covered. When repair nosings are to be used in connection with linoleum, or when recesses are provided, the back and ends will be furnished square or slightly undercut. Necessary anchorage is obtained by wood screws or expansion bolts, depending on the surface covered. Quick-drying magnesite cement is recommended for use in leveling up worn steps.



Detail of Repair

ELEVATOR DOOR SILLS AND SWING DOOR SADDLES

Accuracy in finish, beauty in appearance, extreme durability and effective anti-slip protection distinguish all abrasive metal elevator door sills and swing door saddles manufactured by the AMERICAN ABRASIVE METALS Co.

Each Feralun, Bronzalun, Alumalun or Nicalun Elevator Sill is furnished with machine planed grooves and machined fascia cut outs, whenever fascia plates are to be used. All holes are accurately placed and carefully drilled. Erection delays and erection costs are reduced to a minimum. The AMERICAN ABRASIVE METALS Co. is the largest producer of elevator door sill castings in the world. The skill and experience resulting from the manufacture of tens of thousands of sills are reflected in their accuracy of fit and excellence of finish.

The same abrasive grains and the same manufacturing processes which provide the extreme durability and anti-slip properties of Feralun Stair Treads, Floor Plates and Platforms are responsible for the similar characteristics of Feralun, Bronzalun, Alumalun and Nicalun Elevator door sills. They will outlast the building and provide anti-slip protection which will remain unimpaired after years of heavy use.

Even moderately heavy foot traffic over the ordinary door threshold of brass, bronze, marble or cast iron will soon result in worn depressions and a dangerous, slippery surface. The worn thresholds are not only hazardous but present a distinctly "down at the heel" appearance. The use of the appropriate abrasive metal casting, Bronzalun, Alumalun, Nicalun or Feralun, will insure freedom from such conditions throughout the life of the building. The extremely hard abrasive grains which completely protect the surface of the threshold will absorb the shock of millions of foot contacts before signs of wear become apparent.

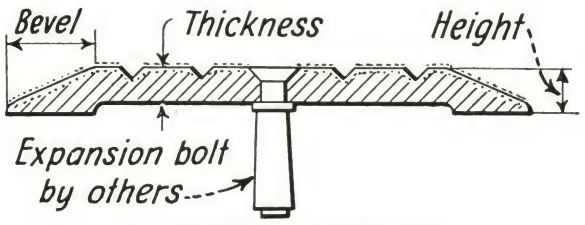
The same accuracy in finish which distinguishes Feralun and other American Abrasive Metal Elevator Sills is apparent in the swing door thresholds of the same materials. This is particularly important when the thresholds are to be used with doors equipped with Rixon hinges or similar door checks. Thresholds with Rixon hinge cut outs will be furnished in one piece, accurately finished to the proper size, with or without cover plates as desired.

In line with the policy of making products as perfect as possible and further to reduce the customers' erection costs, the AMERICAN ABRASIVE METALS Co. have made another improvement in their finishing shop practice which is of interest to every one who has to do with the design, purchase, or installation of elevator saddles.

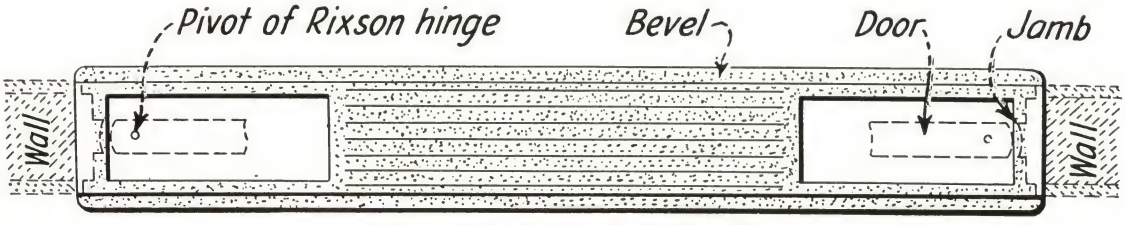
Feralun, Bronzalun, Alumalun, and Nicalun trade-marked elevator saddles are *always easy to install.*

Hereafter all Feralun, Bronzalun, Alumalun, and Nicalun trade-marked elevator saddles designed for a fascia plate will have a true machine-planed cut out.

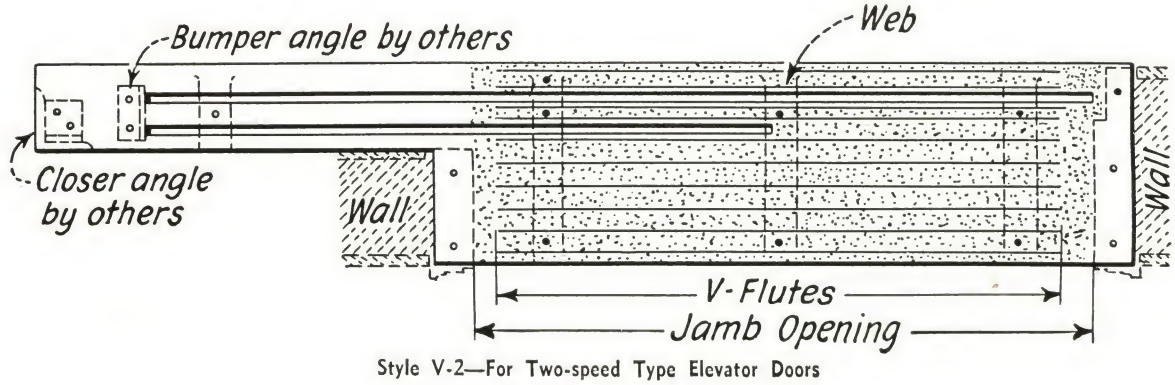
This further service relieves the erector of the usual necessity of bending the fascia plate to take care of foundry draft. It assures a perfect job of erection with less effort.



Style T—With Recess Under Side



Style T—With Cut Outs for Rixson Hinges

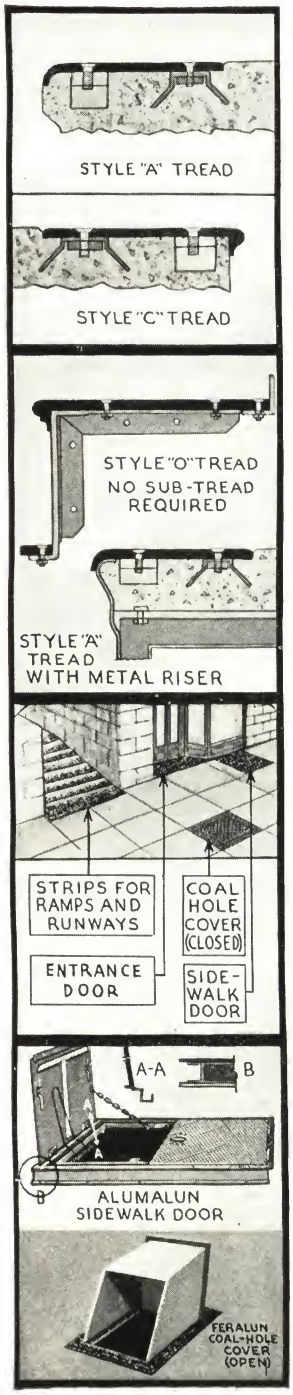


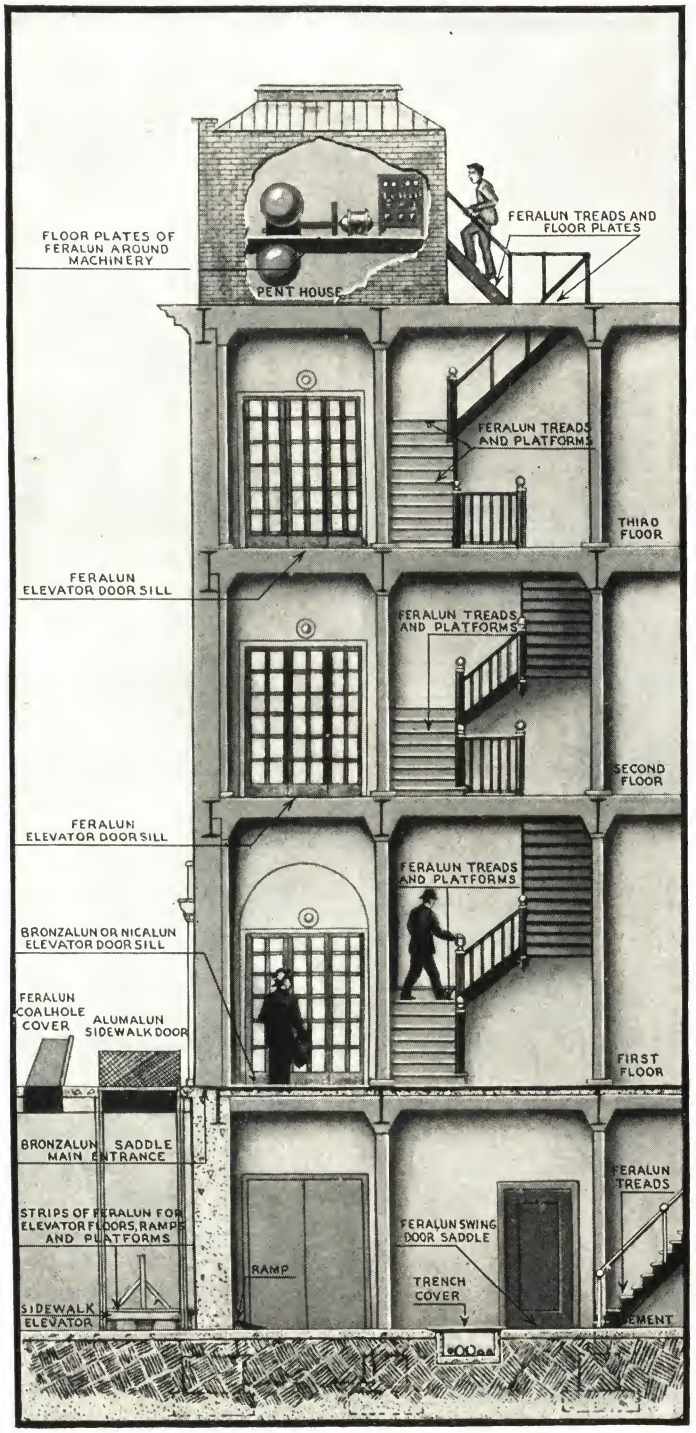
Style V-2—For Two-speed Type Elevator Doors

SAFE WALKWAYS FROM BASEMENT TO PENT HOUSE

FERALUN
BRONZALUN

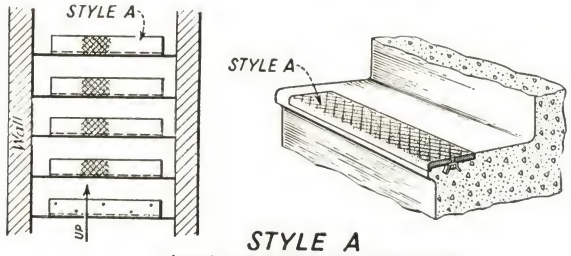
NICALUN
ALUMALUN



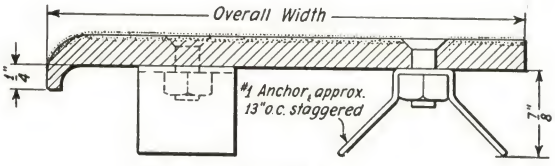


AMERICAN ABRASIVE METALS CO.
50 CHURCH ST. NEW YORK

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



STYLE A
treads are usually 6" or 8" shorter than distance between walls or stringers.



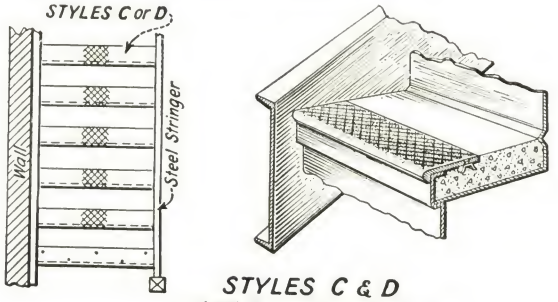
STYLE A

Recommended practice

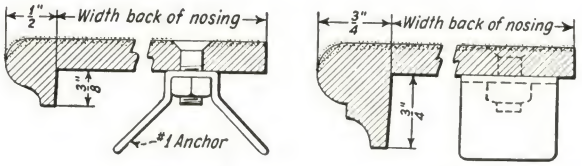
Thickness		Length
Up to 4" wide	1/4"	Up to 5/16" thick not over 6'-0"
" " 9" "	5/16"	Over 5/16" " " " 9'-0"
" " 15" "	3/8"	Over 9'-0" made in sections
" " 20" "	7/16"	
" " 24" "	1/2"	

Treads for Concrete PLATE 1

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



STYLES C & D
extend from stringer to stringer



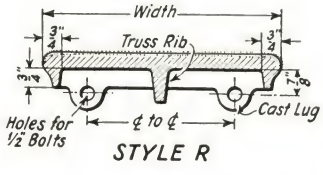
STYLE C **STYLE D**

Recommended practice

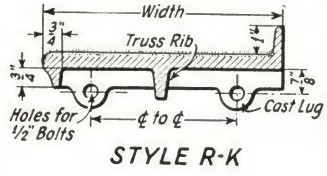
Thickness		Length
Up to 4" wide	1/4"	Up to 5/16" thick not over 6'-0"
" " 9"	5/16"	Over 5/16" " " " 9'-0"
" " 15"	3/8"	Over 9'-0" made in sections
" " 20"	7/16"	
" " 24"	1/2"	

Treads for Pan-Filled Construction PLATE 2

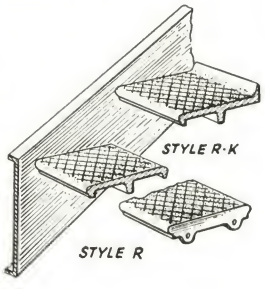
ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



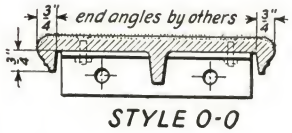
STYLE R



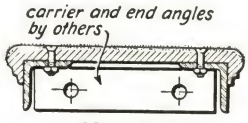
STYLE R-K



STYLES R & R-K
with cast lugs for bolting treads direct to stringers



STYLE O-O



STYLE O-O
When supported by longitudinal carrier angles Style O-O may be 3/8"

Recommended practice
STYLES R, R-K & O-O

Thickness
Not over 42" long ... 7/16"
" " 57" " ... 1/2"
For extra heavy loads submit inquiry.

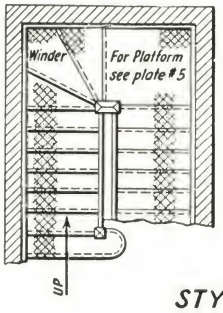
Hole Spacing R & R-K

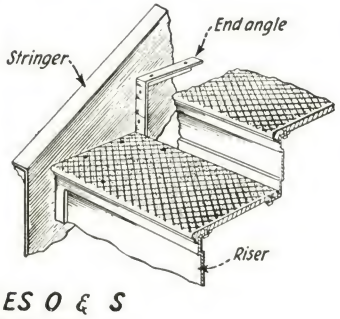
Width	5"	6"	7"	8"	9"	10"
¢ to ¢	2"	3"	3 1/2"	4"	5"	6"

Above styles also made with perforations for drainage. For details see plate #11 or submit inquiry.

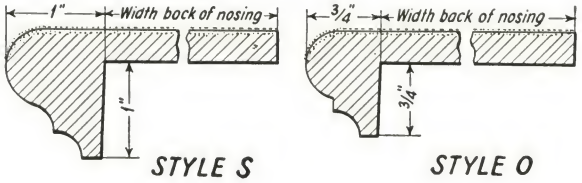
Structural Treads *(no risers required)* PLATE 3

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS





STYLES O & S
with bent risers



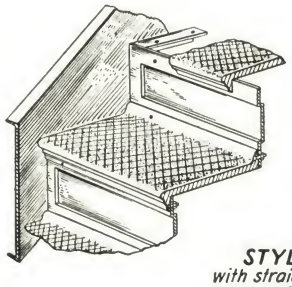
STYLE S **STYLE O**

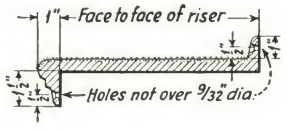
Recommended practice

Thickness		Length
Up to 9" wide	3/8"	Up to 3/8" thick not over 6'-0"
" " 15" "	7/16"	" " 1/2" " " " 9'-0"
" " 24" "	1/2"	Over 9'-0" made in sections.

Structural Treads *(risers required)* PLATE 4

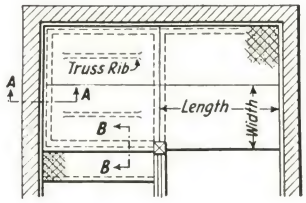
ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS





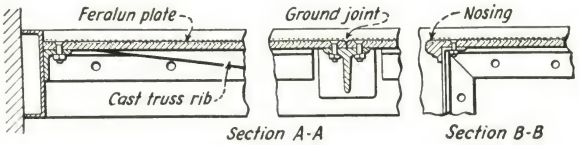
Note:
Thicknesses as on plate #4 but minimum is 7/16"

STYLE K
with straight risers



Recommended practice

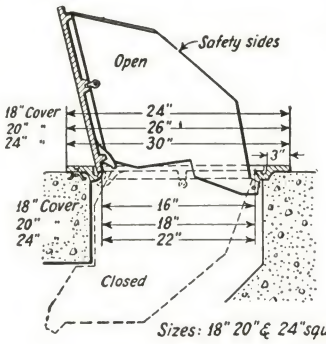
Up to 24" wide 1/2" thick
" " 42" " 5/8" "
Plates not to exceed 42"x54"
For extra heavy loads submit inquiry.

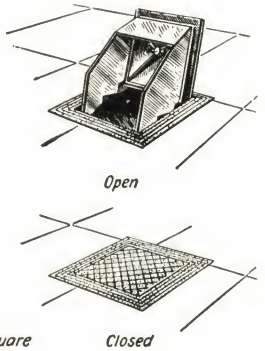


PLATFORMS

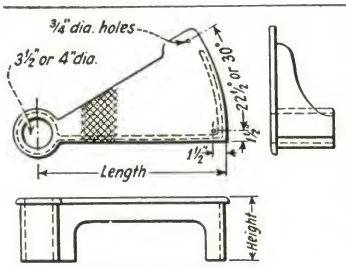
Structural Treads (risers required) - Platforms PLATE 5

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS

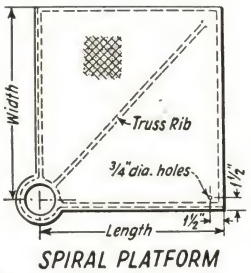




SAFETY COAL HOLE COVER
Also round covers in 18", 20" & 24" diameter.



SPIRAL TREAD

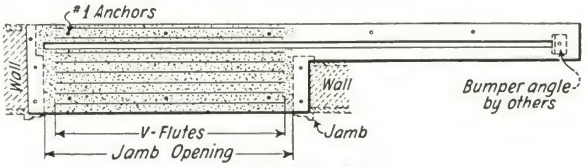


SPIRAL PLATFORM

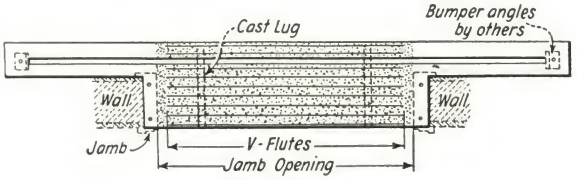
Length 22" to 48"
Minimum height 8 1/4" to allow sufficient headroom.

Coal Hole Covers - Spiral Treads PLATE 6

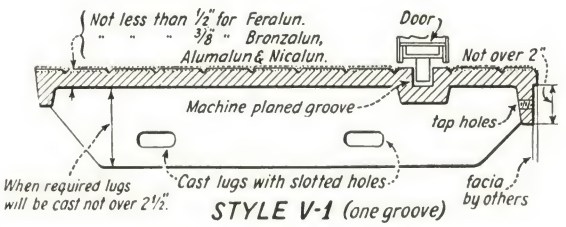
ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



STYLE V-1
for single speed type elevator enclosure



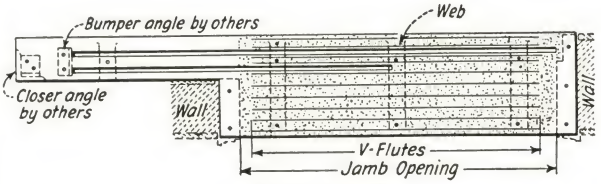
STYLE V-1
for biparting type elevator enclosure



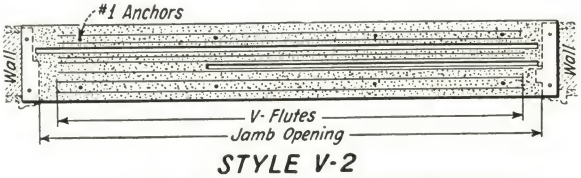
STYLE V-1 (one groove)
Sills over 9'-6" made in sections

Elevator Door Sills PLATE 7

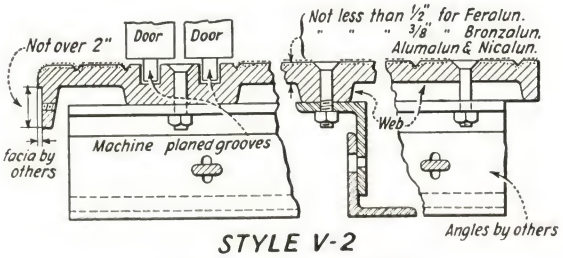
ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



STYLE V-2
for two speed type elevator enclosures



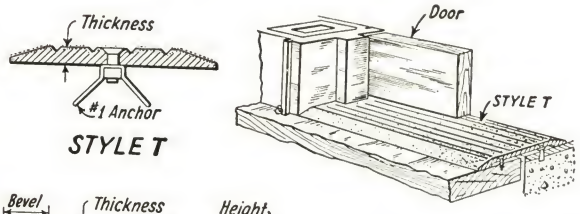
STYLE V-2
for two speed and swing type elevator enclosures



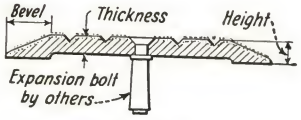
STYLE V-2
Sills over 9'-6" made in sections.

Elevator Door Sills PLATE 8

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



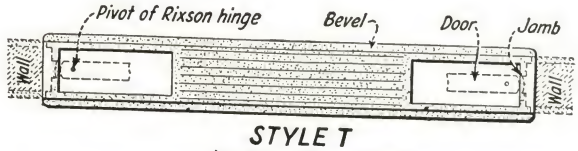
STYLE T



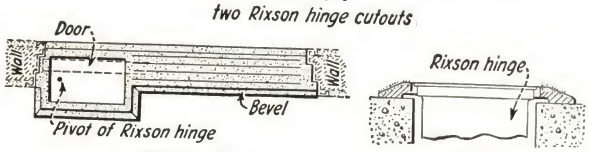
STYLE T
with recess

Recommended practice

Up to 12" wide	3/8" thick
" " 15" "	7/16" "
Over 9'-0" made in sections	



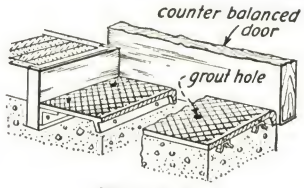
STYLE T
two Rixson hinge cutouts



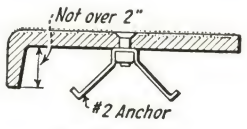
STYLE T
one Rixson hinge cutout.

Door Saddles PLATE 9

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



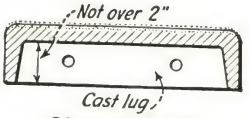
STYLE W
for service elevator opening



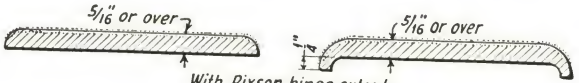
STYLE W

Recommended practice

1/2" thick for Feralun	
3/8" " "	Bronzalun, Alumalun & Nicalun.
Over 9'-0" made in sections	



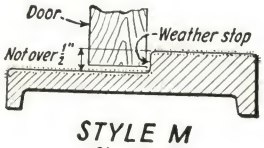
STYLE W-W



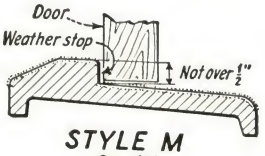
With Rixson hinge cutouts refer to detail on plate #9

STYLE L

STYLE A-A



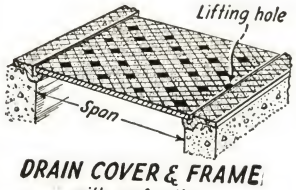
STYLE M
Standard



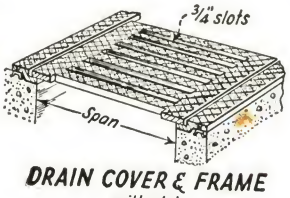
STYLE M
Special

Door Saddles PLATE 10

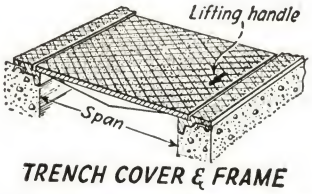
ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



DRAIN COVER & FRAME
with perforations



DRAIN COVER & FRAME
with slots

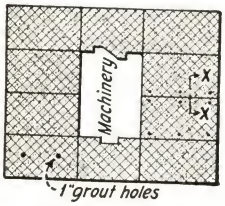


TRENCH COVER & FRAME

Recommended practice

Span up to 24"	1/2" thick
" " " 42"	5/8" "
" " " 54"	3/4" "

Plates not to exceed 42"x54"
For extra heavy loads submit inquiry.



FLOOR PLATES
for use on any flooring
(concrete, wood, steel, etc.)

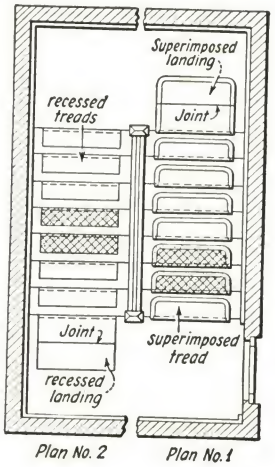
Section X-X

Recommended practice

1/2" thick up to 24"x36"
5/8" " " " 42"x48"
3/4" " " " 42"x54"

Floor Plates - Trench Covers PLATE 11

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS



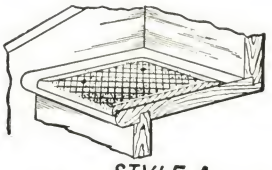
Notes:-

Plan No. 1 shows superimposed treads with back edge and ends bevelled.

Plan No. 2 shows recessed treads with back edge and ends squared.

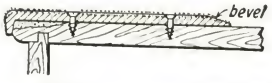
Recommended Practice:-

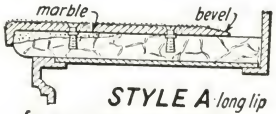
Treads should extend to within 2½" of riser and stringers.



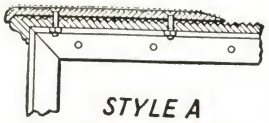
STYLE A
for new or slightly used treads

STYLE A
recessed in treads





STYLE A long lip
for worn wood or marble treads maximum depth of lip 2" from underside of tread.



STYLE A
for worn iron treads.

Treads for Repair Work PLATE 12

SPECIFICATIONS FOR ANTI-SLIP SAFETY TREADS

Safety Treads—All concrete and cement finished steps, including nosing edges of platforms and landings, shall be provided with Feralun Anti-slip Treads, Style [A, C or D] as made by the AMERICAN ABRASIVE METALS CO. Treads on cement finished steps, pan-filled type, shall be [3½, 4 or 6 in.] wide and shall extend the full length of the step. Style A treads on concrete steps shall be [3½, 4, or 6 in.] wide and extend to within [3 or 4 in.] of the strings. Style [C or D] treads shall be [4, 4½, 6 or 7½ in.] wide and shall extend the full length of the step. Treads shall be set flush with the cement surface and shall be firmly secured in the concrete by steel anchors. The surface of the treads shall be kept free of cement.

Concrete Ramps—All concrete ramps shall be provided with Feralun Anti-slip Strips, as made by the AMERICAN ABRASIVE METALS CO. not less than 4 in. wide, spaced not over 4 in. apart and extending to within [3 or 4 in.] of the walls on either side. These strips shall be set flush with the cement surface and shall be securely anchored in the concrete by steel anchors. The surface of the strips shall be kept free of cement.

Steel Stairs with Risers—Steel stairs shall be constructed of channel strings, steel plate risers and Feralun Anti-slip Treads, Style [O, S or K] as made by the AMERICAN ABRASIVE METALS CO., and as shown on the drawings. Treads shall be securely bolted to supporting angles and to the risers. Platforms and landings shall be made of Feralun Anti-slip Material, of suitable thickness for the span required.

Steel Stairs without Risers—Steel stairs to [boiler room, elevator machine rooms, and to mezzanine or other overhead platforms, etc.] shall be constructed of channel strings, without risers, and with Feralun Anti-strip Treads as made by the AMERICAN ABRASIVE METALS CO. Treads shall be Style [R or R-K] with end lugs [5, 6, 8, 9 or 10 in.] wide, bolted directly to the strings, or Style O-O bolted to carrier angles which are attached to the strings. (See Plate 3 for required thickness.) (If perforated treads are required for drainage, specify Style R-G.)

Spiral Stairs—Spiral stairs to mezzanine platforms and in restricted areas shall be constructed to the diameters required [36 to 78 in.] with center pipe, treads, railings, and platforms as shown on the drawings. Treads and platforms shall be made of Feralun Anti-slip Material as made by the AMERICAN ABRASIVE METALS CO.

Door Saddles—Exterior entrance, fire and roof doors shall be provided with saddles of [Feralun, Alumalun, Bronzalun, Nicalun] anti-slip material as made by the AMERICAN ABRASIVE METALS CO., Style [T, L or M] with [fluted, plain or hatched] surface. Saddles shall be full width of wall and extend the full width of door opening. Style T Saddles shall be made with beveled edges and ends cut to fit the door jambs. When required, saddles shall be cast to receive Rixson hinges. Style M Saddles shall be made with rebate to act as weather stop.

Interior doors shall be provided with [Feralun, Bronzalun, Alumalun, Nicalun] Anti-slip Saddles, Style [T, L or A-A] with [fluted, plain or hatched] surface. Saddles shall be full width of partition wall and shall extend the full width of door opening between jambs. Ends shall be cut to fit the door jambs.

Door saddles shall be firmly attached to new concrete by steel anchors. They shall be secured to old concrete and marble by expansion bolts and to wooden floors by wood screws.

Elevator Door Sills—Passenger elevator door openings shall be provided with sills of [Feralun, Bronzalun, Alumalun, Nicalun] anti-slip material with fluted surface as made by the AMERICAN ABRASIVE METALS CO. Sills for sliding doors shall have grooves machined in the solid casting and machined recess for lip on the shaft side to receive fascia plate. Sills for sliding doors shall be full width of wall thickness plus sufficient width to permit the doors to slide back of the wall, and shall extend the full length of shaft opening.

Sills for swing-door elevator openings shall be made of [Feralun, Alumalun, Bronzalun, Nicalun] anti-slip material, Style W, with [fluted, plain or hatched] surface and with cut outs for Rixson hinges if required. The lip on the shaft side shall be machined to receive the fascia plate, if required. Sills shall be full width of the wall thickness and extend the full width of the opening between jambs.

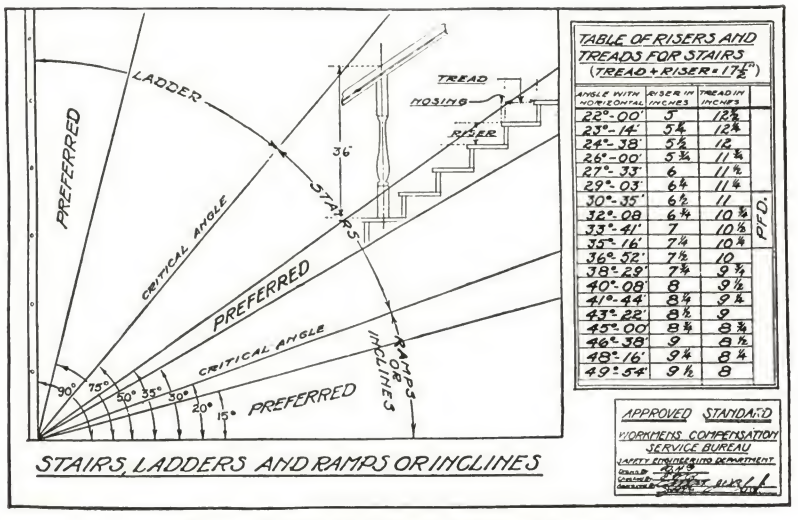
Freight elevator door openings for counterbalanced doors shall be provided with sills of Feralun anti-slip material, Style W, hatched surface, with lip extending down the shaft side. They shall be full width of the wall thickness and extend the full width of the opening between jambs.

Floor Plates—Floor plates [for press rooms, boiler rooms, platforms around machinery and in similar locations] shall be of Feralun anti-slip material, hatched surface, as made by the AMERICAN ABRASIVE METALS CO. Plates shall be cast with truss ribs and be of sufficient thickness to support a live load of 150 lbs. per sq. ft. (or as required). All necessary holes shall be drilled in the plates for attaching them to the steel supports.

Trench covers and frames as indicated on the plans shall be made of Feralun anti-slip material of the dimensions and thicknesses shown on the detailed drawings.

Coalhole Covers and Frames—Where shown on the drawings, install (number) Feralun Safety Coalhole Covers and Frames [18, 20, or 24 in.] square, complete with safety sides, as approved by the Department of Public Works, New York, N. Y.

Safety Treads for Repair Work—Worn stair treads of [wood, marble, slate, stone, concrete, terrazzo, or iron] shall be repaired by placing over them [Feralun, Alumalun or Bronzalun] Anti-slip Treads, Style A, as made by the AMERICAN ABRASIVE METALS CO. For badly worn treads the new treads shall have a lip sufficiently deep to cover the worn nosing. The treads shall extend to within [3 or 4 in.] of the strings and to within 2½ in. of the riser. Superimposed treads shall have beveled back edges and ends. Before setting superimposed treads, all worn parts of the old treads shall be leveled up with quick setting magnesite cement. Recessed treads shall have square backs and ends. New treads shall be firmly secured to the old treads by [wood screws or expansion bolts].



Correct Angles for Ladders, Stairs and Ramps

ABRASIVE-METAL
FERALUN BRONZALUN
ALUMALUN NICALUN
ANTI-SLIP PRODUCTS

MASON SAFETY TREADS

FOR UNDERFOOT SURETY

MANUFACTURED BY

AMERICAN MASON SAFETY TREAD CO.

Lowell, Massachusetts

A TYPE OF MASON SAFETY TREAD FOR EVERY UNDERFOOT SAFETY SERVICE

MASON SAFETY TREAD
Pages 1, 2, 3

MASON STRUCTURAL TREAD—Pages 8, 9
For use where self-supporting structural safety tread is desired.

For use where best appearance in addition to greatest safety is desired.

"Carbo-Cast" SAFETY TREAD AND PLATFORM PLATES
Pages 4, 5
For use where hard service and utility besides structural strength is desired

AMERICAN MASON SAFETY TREAD CO.

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LOWELL, MASS.

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MASON SAFETY TREAD

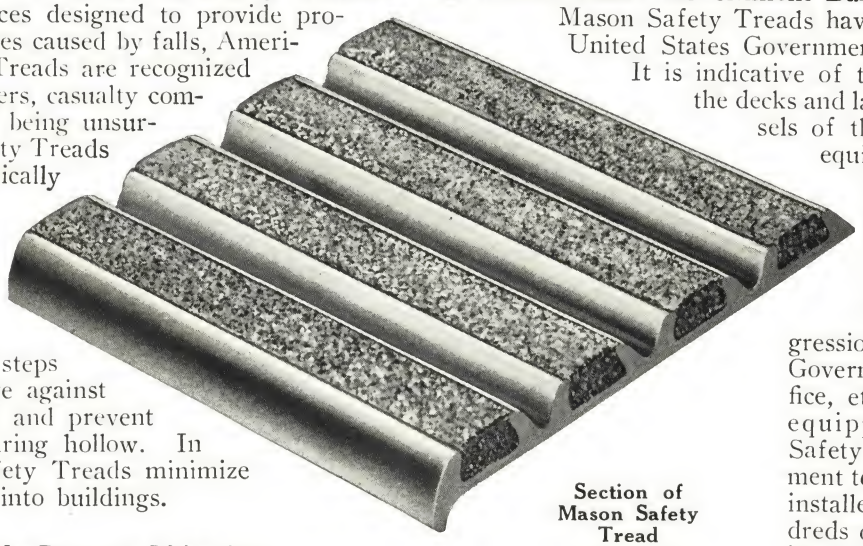
With Rolled Steel, Extruded Hard Brass or White Brass (Aluminum) Base—Carborundum or Lead Filled

For Use Where Good Appearance in Addition to Safety Is Required

Preventing Accidents with Mason Safety Treads

Of all the devices designed to provide protection against injuries caused by falls, American Mason Safety Treads are recognized by architects, engineers, casualty companies and users as being unsurpassed. Mason Safety Treads provide what is practically positive immunity from slipping.

Mason Safety Treads insure greater durability for stairs of any type and on concrete steps they protect the edge against fracture or chipping and prevent the steps from wearing hollow. In addition, Mason Safety Treads minimize the tracking of dirt into buildings.



Section of Mason Safety Tread
(Actual size)

In United States Government Buildings

Mason Safety Treads have been used by the United States Government for many years. It is indicative of their reliability that the decks and ladders of many vessels of the U. S. Navy are equipped with Mason Safety Treads and that they are used in all the larger Governmental buildings in Washington — the Congressional Library, the Government Printing Office, etc. The Capitol is equipped with Mason Safety Treads from basement to dome and they are installed on steps of hundreds of post office buildings throughout the country.

Mason Safety Treads Prevent Litigation

Not only do Mason Safety Treads protect the pedestrian, they also protect the owner from accident litigation. It has been repeatedly recognized by judges and juries alike that if a person is injured by a fall on a stair thus equipped it is not the fault of the owner because adequate precaution had been taken to provide safe underfoot conditions.

Service and Co-operation

Any desired information regarding Mason Safety Treads will gladly be furnished and we will co-operate in the solution of any problem involving the installation of safety tread equipment.

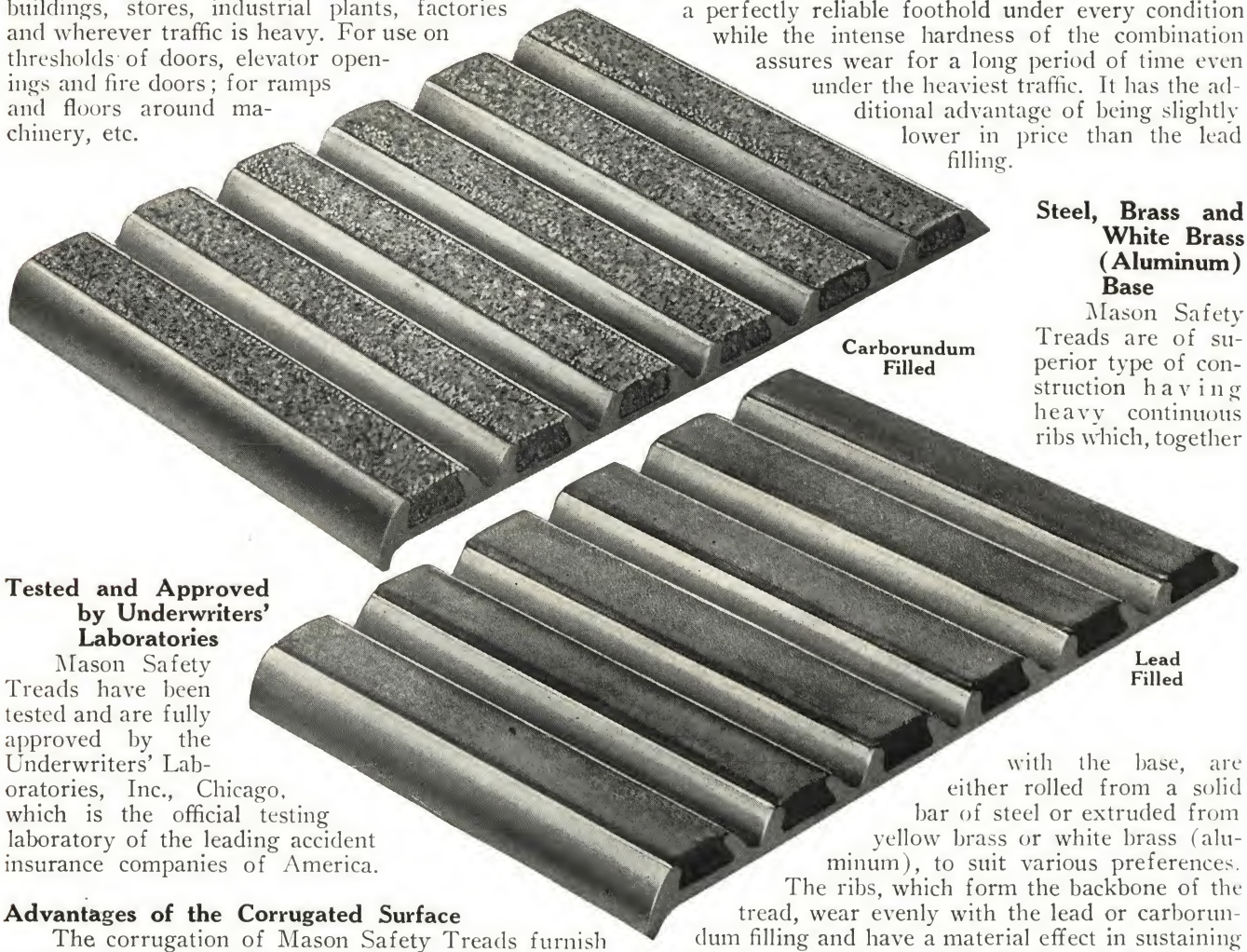
Typical Installations of Mason Safety Treads

On the stairs of the finest banks and office buildings; department and other stores; courthouses and public institutions; colleges, schools, hospitals, railroad stations, subways, powerhouses, factories, etc., Mason Safety Treads are used to prevent accidents

For Interior and Exterior Use on Granite, Marble, Slate, Cement, Iron or Wood Steps

Mason Safety Treads are adaptable to all situations *inside or outside* of a building, where the surface is liable to become slippery or where steps have worn to an uneven surface.

They are especially desirable for stairs in public buildings, stores, industrial plants, factories and wherever traffic is heavy. For use on thresholds of doors, elevator openings and fire doors; for ramps and floors around machinery, etc.



Carborundum Filled

Lead Filled

Tested and Approved by Underwriters' Laboratories

Mason Safety Treads have been tested and are fully approved by the Underwriters' Laboratories, Inc., Chicago, which is the official testing laboratory of the leading accident insurance companies of America.

Advantages of the Corrugated Surface

The corrugation of Mason Safety Treads furnish maximum protection from falls caused by waste substances on stairways such as match-sticks, fruit skins, etc., because these naturally roll into the grooves when stepped upon, leaving the non-slip metal surfaces clean. The corrugations also provide for the drainage of water presenting a dry contact surface for the foot at all times.

The Non-slip Fillings

The U-shaped corrugations of Mason Safety Treads alternate with dove-tailed grooves, the latter being filled with a non-slip substance—either *lead* or *carborundum*.

Lead Filling—Lead is sometimes preferred because of its clear gray appearance. It is an excellent non-slip substance and forms a contrast with the metal base of the tread which is very pleasing. Lead filling, however, is not recommended where oily conditions exist. Under this condition use carborundum filling.

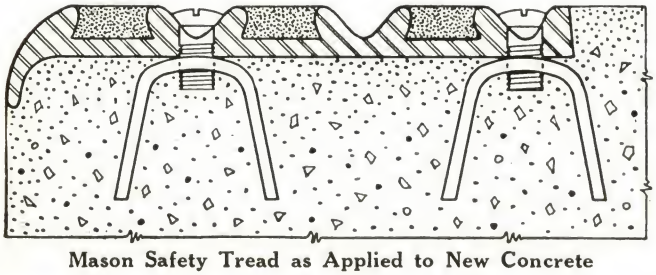
Carborundum Filling—Carborundum is combined with other elements which serve as a binder and is cured by improved methods. Under this process it furnishes a perfectly reliable foothold under every condition while the intense hardness of the combination assures wear for a long period of time even under the heaviest traffic. It has the additional advantage of being slightly lower in price than the lead filling.

Steel, Brass and White Brass (Aluminum) Base

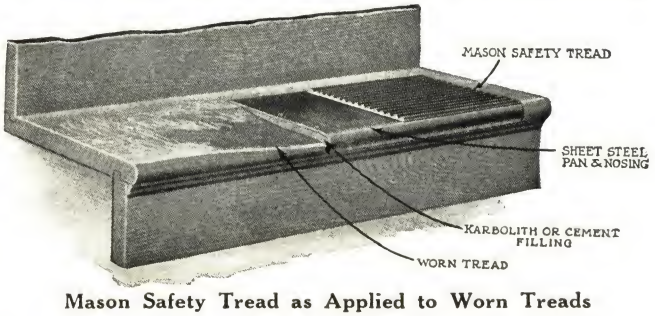
Mason Safety Treads are of superior type of construction having heavy continuous ribs which, together with the base, are either rolled from a solid bar of steel or extruded from yellow brass or white brass (aluminum), to suit various preferences. The ribs, which form the backbone of the tread, wear evenly with the lead or carborundum filling and have a material effect in sustaining the non-slip qualities of the Tread throughout its life. As the ribs are continuous, lead is never pushed over into the U-shaped corrugation by wear. There are no jagged edges for the retention of dirt and, as the tread wears, it leaves no polished, dangerous slip-inviting surface.

For Old as Well as New Work

Mason Safety Treads are particularly adapted for repair purposes. Very badly worn stair treads are easily repaired by the method shown below. The worn portion is built up to the proper level with Karbolith, or cement fillings, on which the Tread rests and all evidences of wear and repair are concealed by the heavy nosing.



Mason Safety Tread as Applied to New Concrete



Mason Safety Tread as Applied to Worn Treads

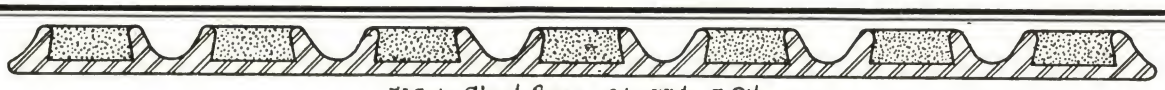


FIG. 1, Steel Base, 6 in Wide, 7 Ribs.

FIG 1A, Steel Base, 6 in Wide, 7 Ribs with Nosing.

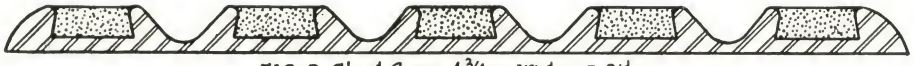


FIG. 2, Steel Base 4¾ in. Wide, 5 Ribs.

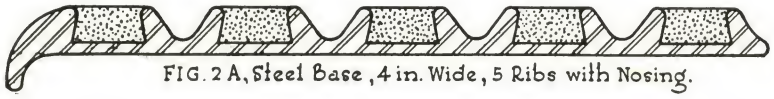


FIG. 2 A, Steel Base, 4 in. Wide, 5 Ribs with Nosing.

FIG. 3, Steel Base, 4 in. Wide, 5 Ribs.

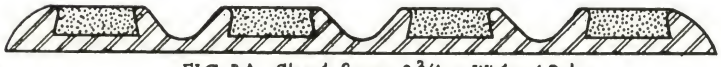


FIG. 3A. Steel Base 3¾ in. Wide, 4 Ribs.

FIG. 6, Steel Base 2½ in. Wide, 3 Ribs.

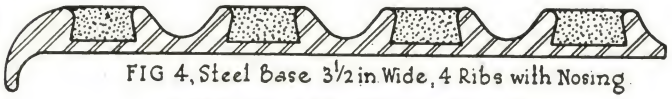


FIG 4, Steel Base 3½ in Wide, 4 Ribs with Nosing.

FIG. 5, Steel Base, 3 in. Wide, 3 Ribs, Nosing and Straight Back.
Especially made for granolithic work or for use with cork backing.

MASON SAFETY TREADS WITH STEEL BASE

Base is rolled, unperforated steel with alternate U-shaped and dovetailed grooves filled with lead or carborundum.

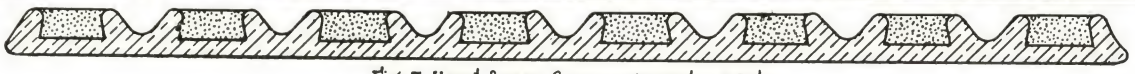


Fig. 7, Hard Brass Base, 6" in. Wide, 8 Ribs.

Fig. 7A, Hard Brass Base, 5¼ in. Wide, 6 Ribs with Nosing.

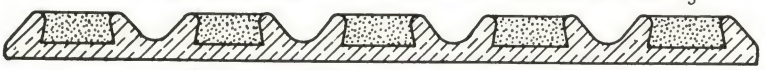


FIG. 8, Hard Brass Base, 4 in. Wide, 5 Ribs.

FIG. 9, Hard Brass Base, 3 in. Wide, 4 Ribs.

FIG. 10, Hard Brass Base 2¼ in. Wide, 3 Ribs.

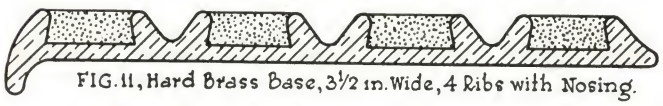


FIG. 11, Hard Brass Base, 3½ in. Wide, 4 Ribs with Nosing.

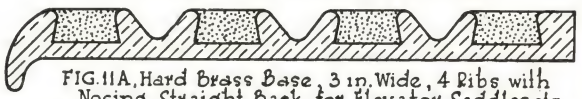


FIG. 11A, Hard Brass Base, 3 in. Wide, 4 Ribs with Nosing, Straight Back for Elevator Saddles etc.

FIG. 12, Hard Brass Base, 2⅛ in. Wide 3 Ribs with Nosing.

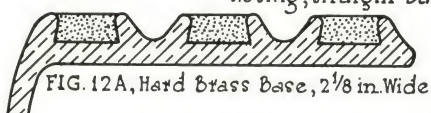


FIG. 12A, Hard Brass Base, 2⅛ in. Wide, 3 Ribs with Nosing.

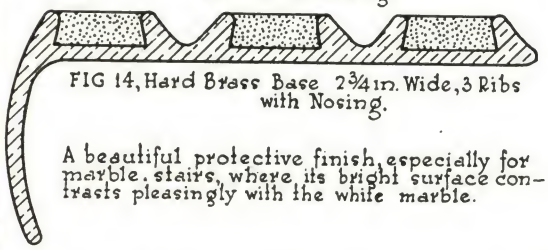
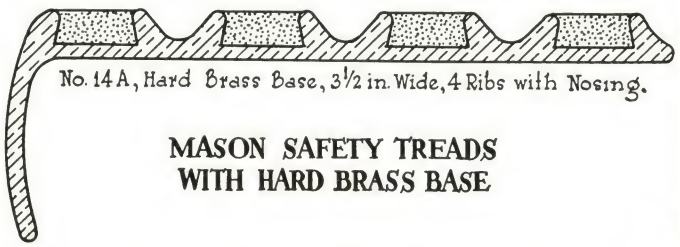


FIG 14, Hard Brass Base 2¾ in. Wide, 3 Ribs with Nosing.

A beautiful protective finish, especially for marble stairs, where its bright surface contrasts pleasingly with the white marble.



No. 14 A, Hard Brass Base, 3½ in. Wide, 4 Ribs with Nosing.

MASON SAFETY TREADS WITH HARD BRASS BASE

Base of hard extruded brass (delta metal) with alternate U-shaped and dovetailed grooves filled with lead or carborundum.

SWEETS CATALOGUE SERVICE	DETAILS OF STANDARD SIZES OF MASON SAFETY TREAD	SCALE FULL SIZE	DRWG. 1

Carbo-Cast

MASON SAFETY TREADS

A Safety Tread of Abrasive Metal Made of Iron, Bronze or Aluminum

Carbo-Cast

Carbo-Cast is the trade-name of our treads in which the abrasive is an integral part of the body metal. Certain styles require no sub-tread and can be used with or without a riser. May also be used for repair work as shown on details.

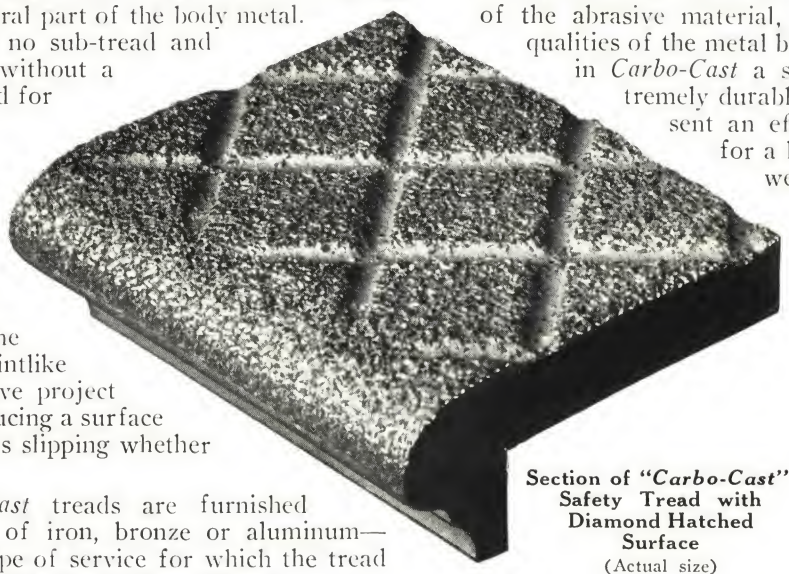
Description

When the tread is cast, a carborundum or aluminous abrasive is embedded in the wearing surface of the molten metal. The flintlike particles of the abrasive project above the surface producing a surface that effectively prevents slipping whether wet or dry.

Metals—*Carbo-Cast* treads are furnished with the body metal of iron, bronze or aluminum—depending upon the type of service for which the tread is required or the architectural effect desired.

Surfaces—*Carbo-Cast* treads are furnished in the three surfaces illustrated below, namely:

Fluted
Diamond Hatched
Plain



Section of "*Carbo-Cast*" Safety Tread with Diamond Hatched Surface
(Actual size)

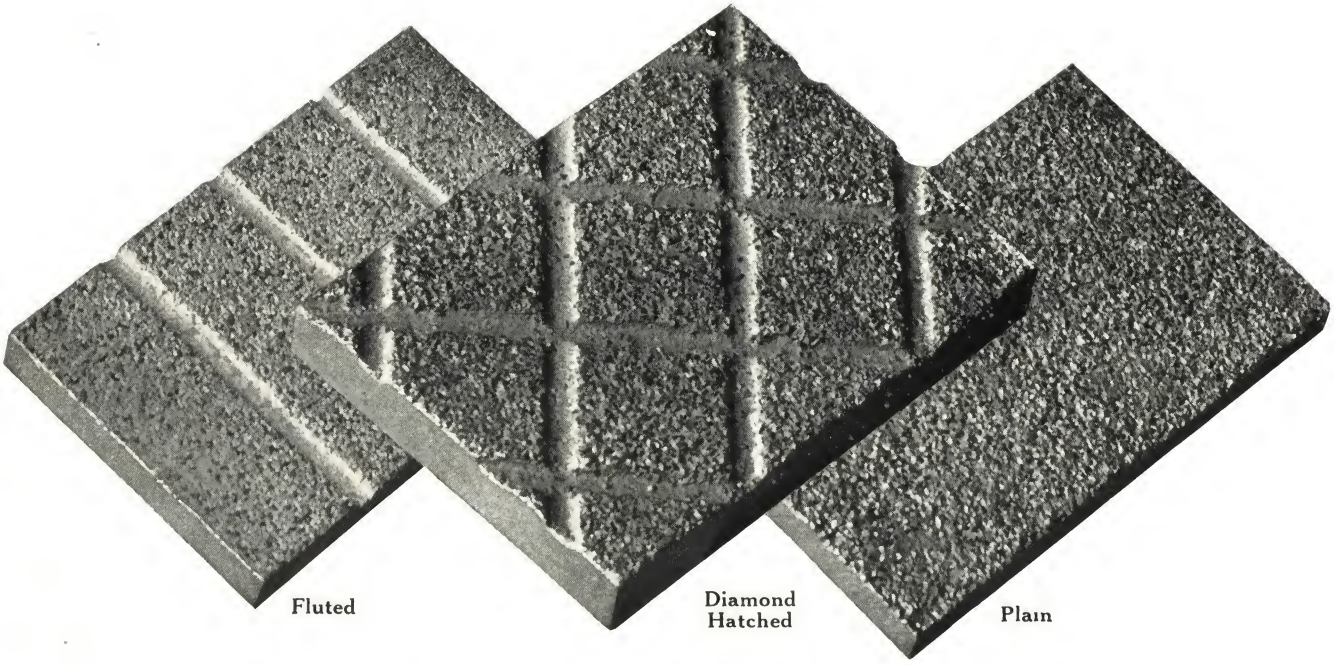
Wearing Qualities

The extreme hardness and wear resisting qualities of the abrasive material, combined with similar qualities of the metal body, combine to produce in *Carbo-Cast* a safety tread that is extremely durable and one that will present an effective non-slip surface for a long period despite hard wear.

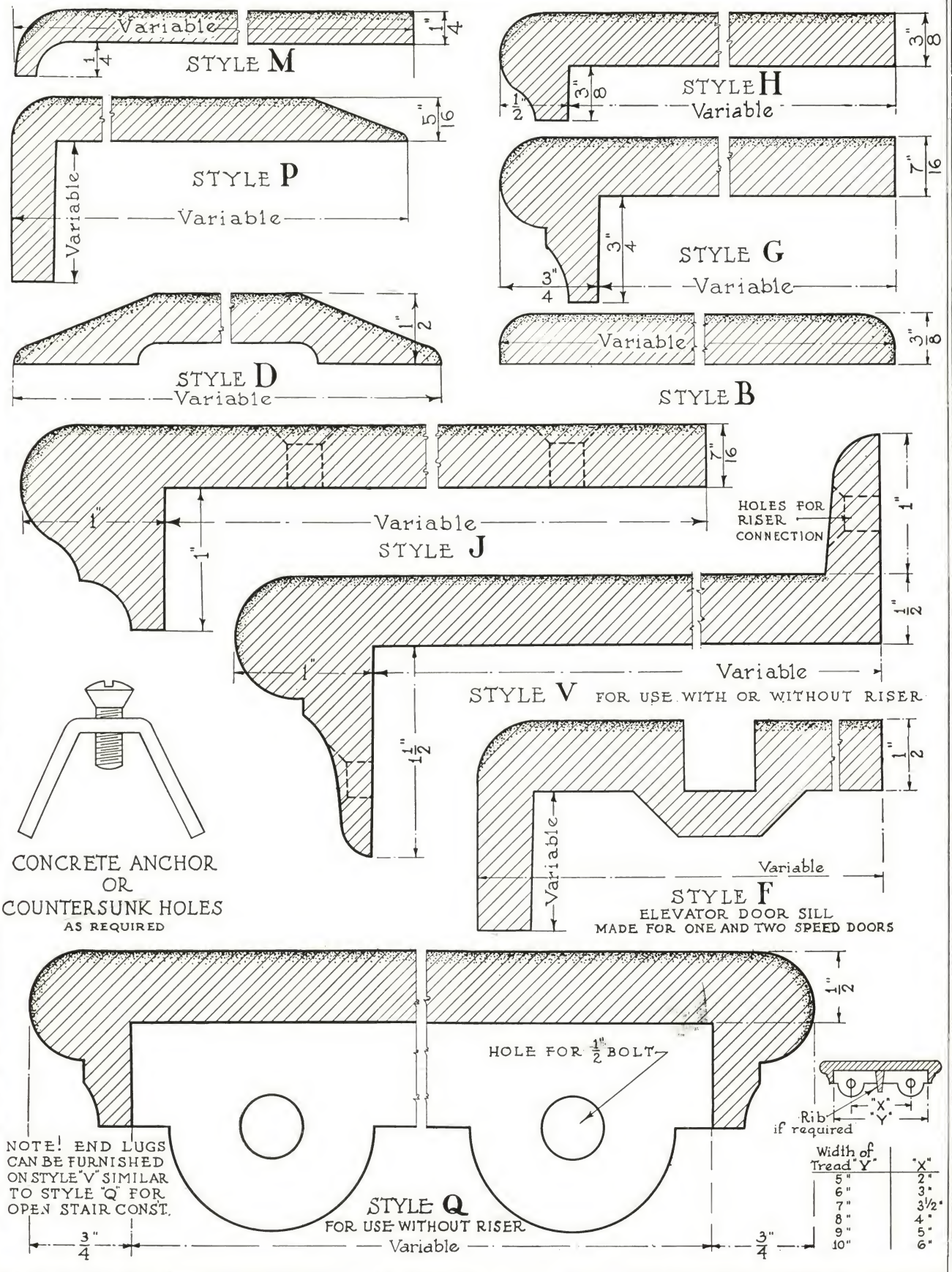
Carbo-Cast Safety Treads possess a high resistance to corrosion due to the fact that the addition of carborundum or aluminous abrasive at the time of casting tends to densify the metal.

Installation

Carbo-Cast Safety Treads are easily and quickly installed on new or old work. On new concrete the treads are fastened by means of metal anchors attached to the safety tread and metal anchors embedded in the concrete. For old concrete, marble, slate, etc., the use of expansion bolts is recommended. Only wood screws are needed to hold the treads securely in place on wood stairs.



VARIOUS SURFACES OF "*Carbo-Cast*" IN ACTUAL SIZE



SWEETS CATALOGUE SERVICE	DETAILS OF MASON *Carbo-Cast* SAFETY TREADS	SCALE FULL SIZE	DRW'G 2

MASON SAFETY NOSINGS AND EDGINGS

Nosings

Furnished in brass and white brass (aluminum) for use with linoleum, cork carpet, rubber, interlocking tile, carpet or any other form of covering on stairs of wood, concrete, slate, marble, iron, etc.

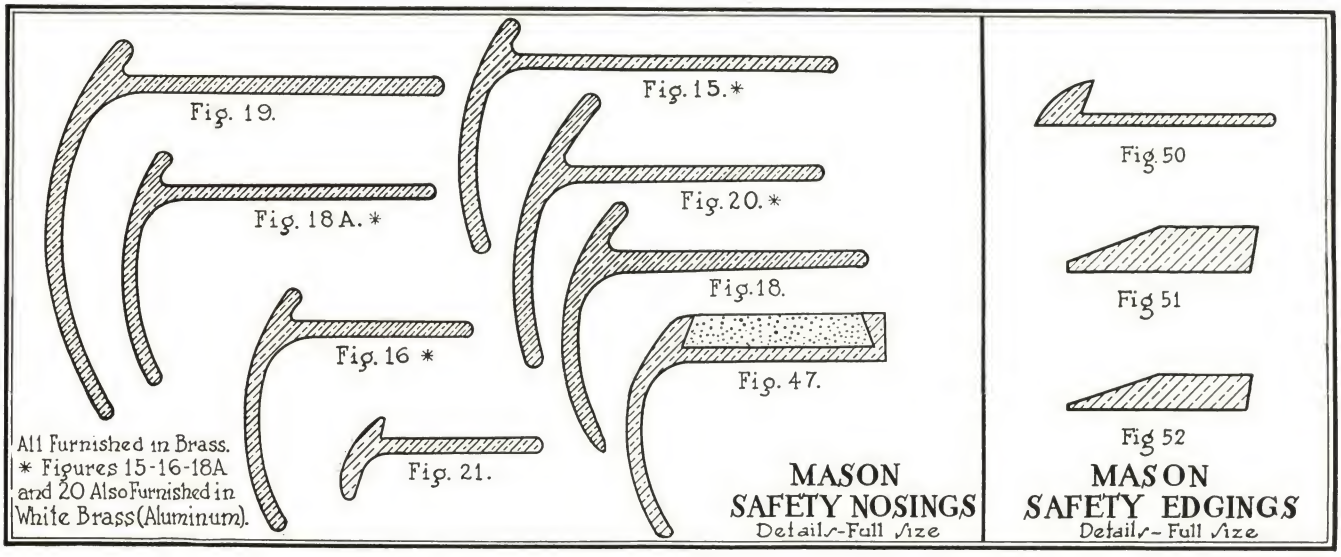
All types are provided with a deep sturdy lip which protects the stair, and with a vertical top so beveled as to lock the covering securely in place. Mason Safety Nosings protect the covering at the front edge where the wear is greatest.

Brass or white brass (aluminum) nosings are desirable for use where light is poor as they reflect the available light thereby clearly defining the edge of the step. They present a handsome appearance and may be restored to their original high luster by the wipe of a cloth.

Sizes—Furnished in any of the sizes shown below in solid highly polished extruded brass. Figs 15, 16, 18, 18A and 20 also furnished in aluminum, either highly polished or clear satin finish.

Edgings

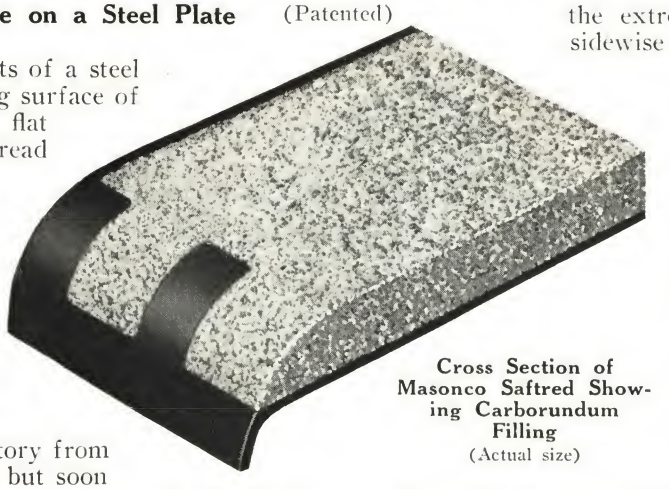
For use with linoleum, cork carpet, rubber, tile, etc. where only part of the floor is covered. They protect the edge of the floor covering from being broken by scuffing and also prevent tripping. Furnished according to full size sections shown below in extruded brass, cut to length, drilled and polished.



MASONCO SAFTRED

Solid Carborundum Surface on a Steel Plate Base (Patented)

Masonco Saftred consists of a steel plate base with a flat wearing surface of solid carborundum. This flat carborundum bed gives the tread an exceptionally clean-cut appearance and presents an abrasive wearing surface that extends clear through to the metal base.



Cross Section of Masonco Saftred Showing Carborundum Filling
(Actual size)

Saftred Nosing

Plain nosings of cast iron, steel or other hard materials may prove satisfactory from the standpoint of durability, but soon become polished, smooth and slippery. On the other hand, nosings which consist solely of tile or other non-slip materials may prevent slipping but they do not possess durability.

The nosing of the Masonco Saftred embodies the desirable features of both types. The carborundum and steel in the nosing dovetail in toothlike formation combining the wear resistance of the steel with the non-slip qualities of the carborundum. The Saftred Nosing prevents the foot from slipping forward over the extreme edge of the step and sidewise as well.

Outstanding Advantages

Any size tread furnished complete in one unit ready for installation.

A flat tread with plain surface—no corrugations; no projections; no depressions.

Light in weight—built for durability.

Tread remains slipproof for its entire life.

Nosing is absolutely slipproof approached from any angle.

Provides an economical and durable method of repairing old and worn stairs.

Widths and Lengths

Masonco Saftreds are made in one piece, in widths to fit any tread up to 12 in. and in lengths up to 60 in. Nosings are regularly ½ in. deep, but any size or shape will be furnished to meet special requirements.

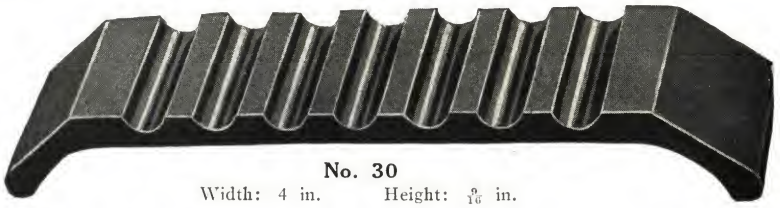
The treads are shipped with screw holes countersunk, ready for installation.

MASON ROLLED STEEL DOOR SADDLES

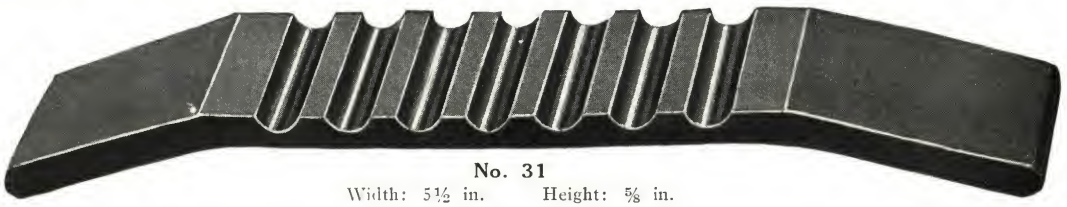
Mason Rolled Steel Door Saddles are lower in cost than cast iron saddles, yet they are exceptionally strong. The surface is deeply grooved. While the parallel grooves afford a certain immunity to slipping, where an absolute slipproof threshold is desired, the use of Mason *Carbo-Cast* Saddles is recommended.

Mason Rolled Steel Door Saddles are designed for use at fire doors, elevator shafts and wherever service conditions are severe. They are particularly adapted to withstand, without breaking, the heavy pounding of traffic and trucks in industrial plants, warehouses, railroad freight terminals and similar establishments.

Made in two widths, 4 and 5½ in., and are furnished from stock cut and drilled in any length up to 16 ft.

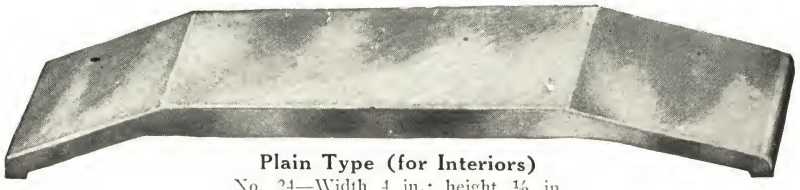


No. 30
Width: 4 in. Height: $\frac{9}{16}$ in.

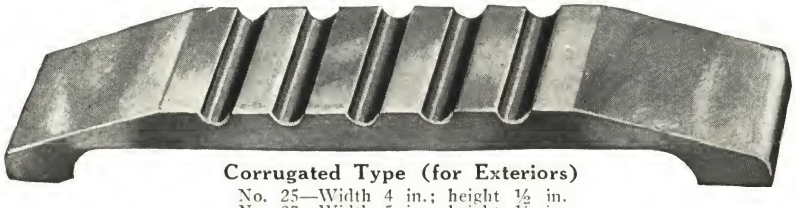


No. 31
Width: 5½ in. Height: ⅝ in.

MASON EXTRUDED BRASS AND WHITE BRASS (ALUMINUM) DOOR SADDLES



Plain Type (for Interiors)
No. 24—Width 4 in.; height ½ in.
No. 26—Width 5 in.; height ½ in.
No. 28—Width 6 in.; height ½ in.



Corrugated Type (for Exteriors)
No. 25—Width 4 in.; height ½ in.
No. 27—Width 5 in.; height ½ in.
No. 29—Width 6 in.; height ½ in.

Mason Extruded Brass Door Saddles are suitable for use in any type of building. They are recommended where appearance, combined with protection against wear and slipping, is a factor. Brass door saddles are very attractive and harmonize readily with the finest interiors or exteriors where the use of a metal threshold is practical.

The extruding process used in the manufacture of Mason saddles results in a product of great strength and durability together with absolute uniformity.

Mason Extruded Brass Door Saddles are furnished in two types—*plain* which is adapted for interior use, and the *corrugated* recommended for exterior use. Both types are available in standard widths of 4, 5, and 6 in., and furnished from stock in any length up to and including 12 ft.

Corrugated type also furnished in white brass (aluminum) ⅞ in. high only; 4, 5 and 6-in. widths.

MASON NON-SLIP LADDER SHOES

For Use in Industrial Plants, Stockrooms and Similar Locations

Mason Non-Slip Ladder Shoes hold the ladder securely to floors of iron, steel, wood or concrete. They provide an effective and inexpensive method of preventing falls caused by the slipping of a ladder on a smooth floor. The use of ladder shoes also obviates the necessity of having a second man to hold the ladder, resulting in saving of time and expense.

The swivel method of attaching the shoes to the ladder permits them to lie flat on the floor regardless of the angle at which the ladder is placed. The abrasive tread is long wearing and will retain its effectiveness indefinitely.

Shoes are fastened to the ladder with heavy bolts as shown in the illustration and are quickly and easily installed on new or old ladders or transferred from one ladder to another.

SIZES OF NON-SLIP LADDER SHOES

Size No.	Contact base, in.	Width of clevis, in.
1	5¼ x 1½	1¼
3	5¼ x 1⅝	1½
5	5¼ x 2¼	2

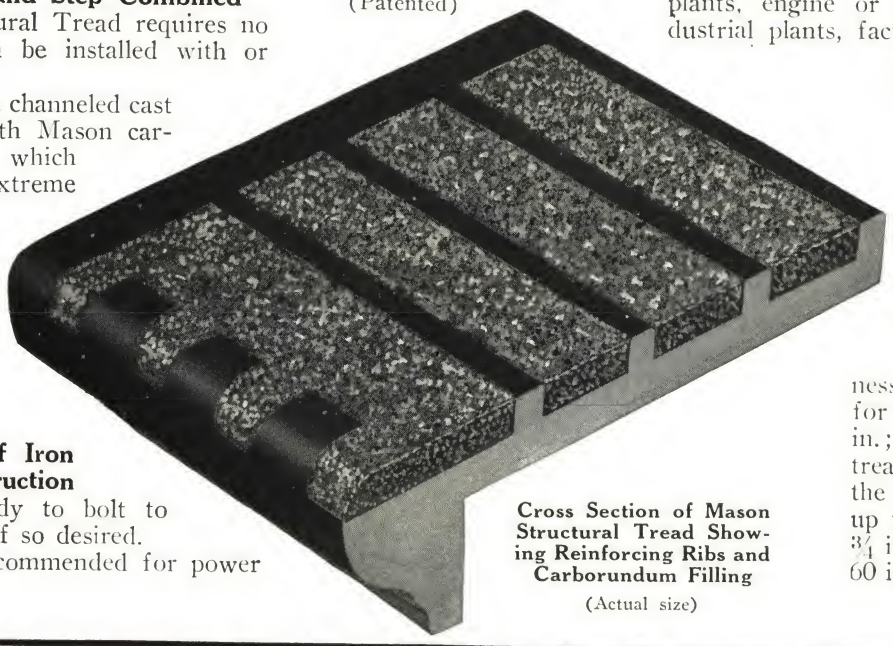
MASON STRUCTURAL TREAD

(Patented)

A Safety Tread and Step Combined

Mason Structural Tread requires no sub-tread and can be installed with or without a riser.

It consists of a channeled cast iron base filled with Mason carborundum filling which extends to the extreme edge with additional reinforcing of cast iron on the front edge.



Cross Section of Mason Structural Tread Showing Reinforcing Ribs and Carborundum Filling

(Actual size)

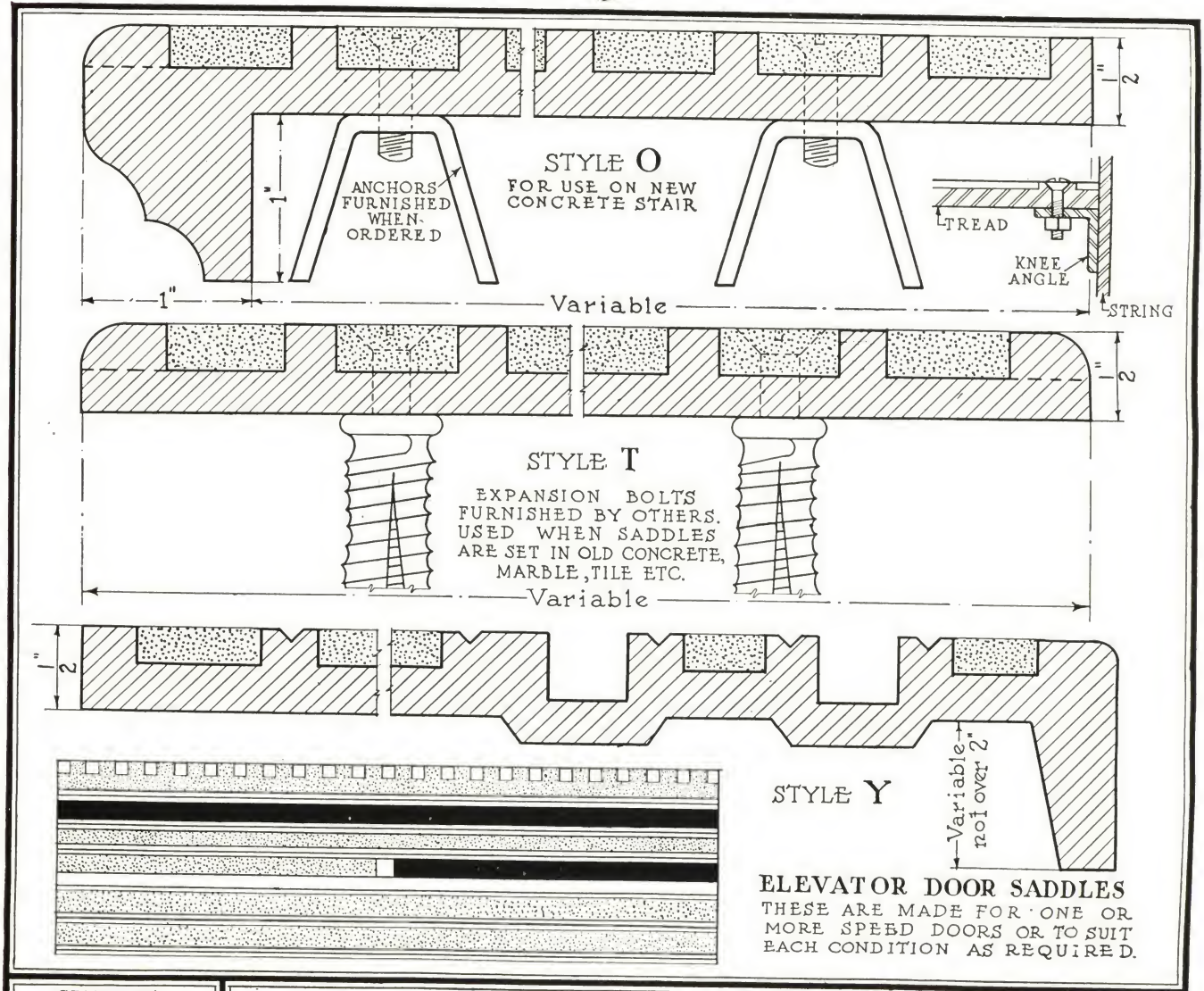
For Any Type of Iron Stair Construction

Furnished ready to bolt to staircase stringers if so desired.

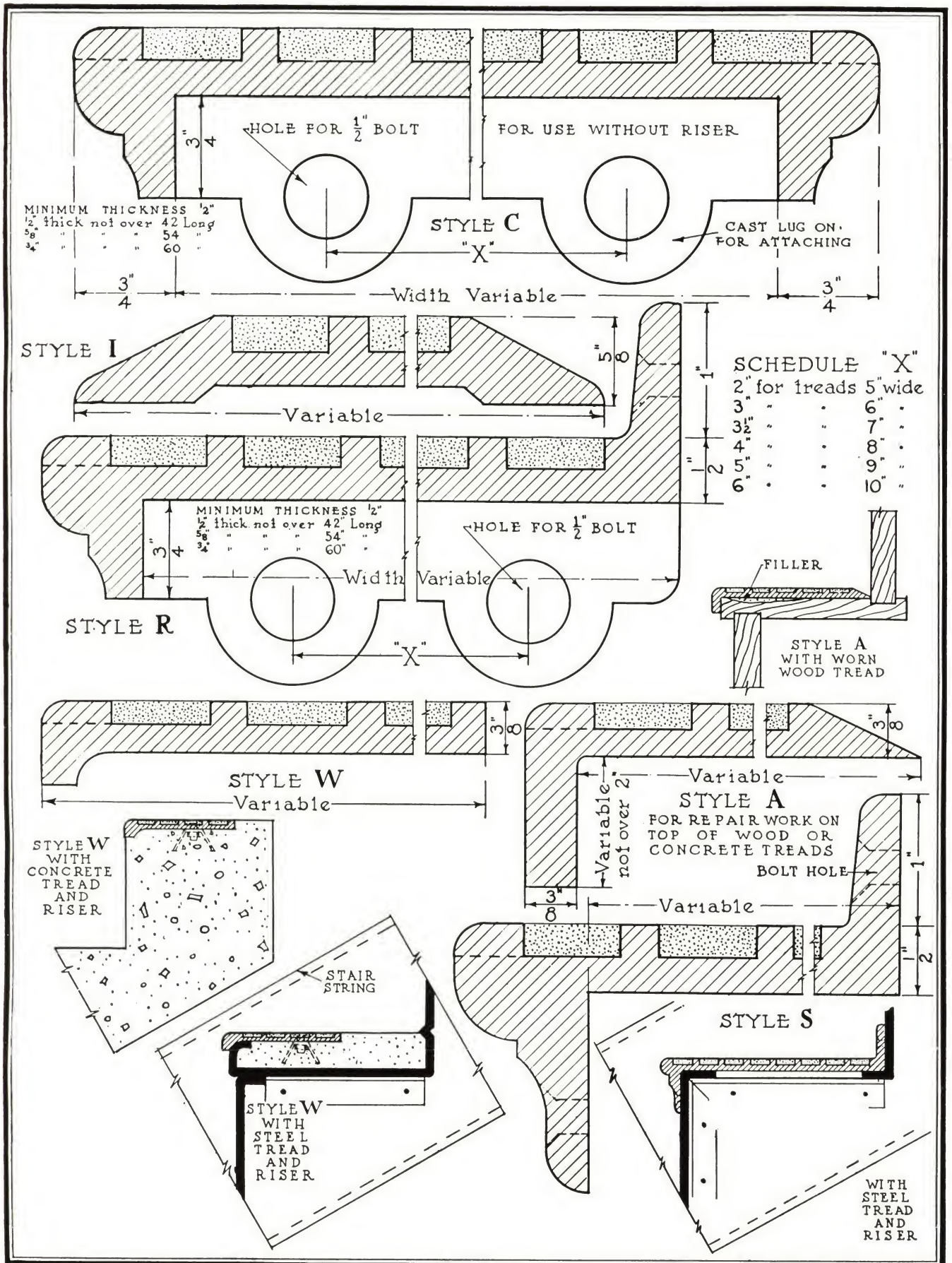
Particularly recommended for power plants, engine or boiler rooms, industrial plants, factories, schools and for heavy traffic conditions.

Widths and Lengths

Furnished in any tread width; in lengths up to 50 in.; and in thicknesses of ½, 9/16, 5/8 and ¾ in. The ½ in. thickness is recommended for treads up to 36 in.; the 9/16 in. for treads up to 40 in.; the 5/8 in. for treads up to 48 in.; and the ¾ in. for treads up to 60 in. in length.

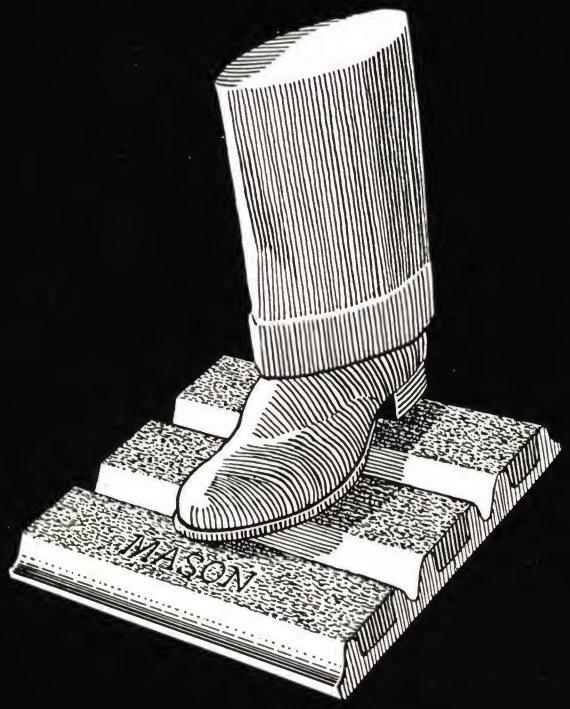


SWEETS CATALOGUE SERVICE	DETAILS OF MASON STRUCTURAL TREADS	SCALE FULL SIZE	DRWG. 3



SWEETS CATALOGUE SERVICE	DETAILS OF MASON STRUCTURAL TREADS	SCALE FULL SIZE	DRWG. 4

MASON
SAFETY TREADS



WOOSTER PRODUCTS INC.

SUCCESSORS TO THE SAFETY STAIR TREAD COMPANY

Wooster Safe-Groove Stair Treads—Wooster Combination Tread and Nosing
Wooster Security Nosing—Wooster Security Edging
Ferrogrit—Alumogrit—Bronzogrit

WOOSTER, OHIO

NEW YORK OFFICE, 1133 Broadway CHICAGO OFFICE, 803 Transportation Building

Ferrogrit—Alumogrit—Bronzogrit

Ferrogrit, Alumogrit and Bronzogrit are the registered trade names for Wooster's improved abrasive anti-slip cast-in-the-surface products. Designed for the major building requirements, such as stair treads, elevator saddles, floor plates, thresholds, etc. May be self-supporting with or without riser construction, or as superimposed tread on other materials.

Metal Bases—Ferrogrit signifies cast iron base; Alumogrit, cast aluminum base; Bronzogrit, cast bronze. At the time of casting, the metal base has abrasive grits (natural and manufactured aluminous oxides) deeply impregnated into its wearing surface. This method of casting gives the maximum density of anti-slip thoroughly bonded and held by the metal base.

Surfaces—Ferrogrit, Alumogrit and Bronzogrit are available in plain, fluted and cross-hatched surfaces, each type being cast by the Wooster Method with no difference in the quality or utility. Large areas and stair treads are usually cross-hatched, while thresholds and elevator saddles are often produced with the plain or fluted surfaces.

Design—Ferrogrit, Alumogrit and Bronzogrit treads are available in refined designs for all types of construction. Plates 1 and 2 show standard sections available, with suggested applications.

This type of tread may be made in any width and thickness consistent with casting practices.

Wooster Safe-Groove Tread

Wooster Safe-Groove Tread is made in solid metal bases, of scientific design and proportion; to protect stairs and other walking surfaces from becoming dangerous slipping hazards and from disfiguring wear of heavy traffic.

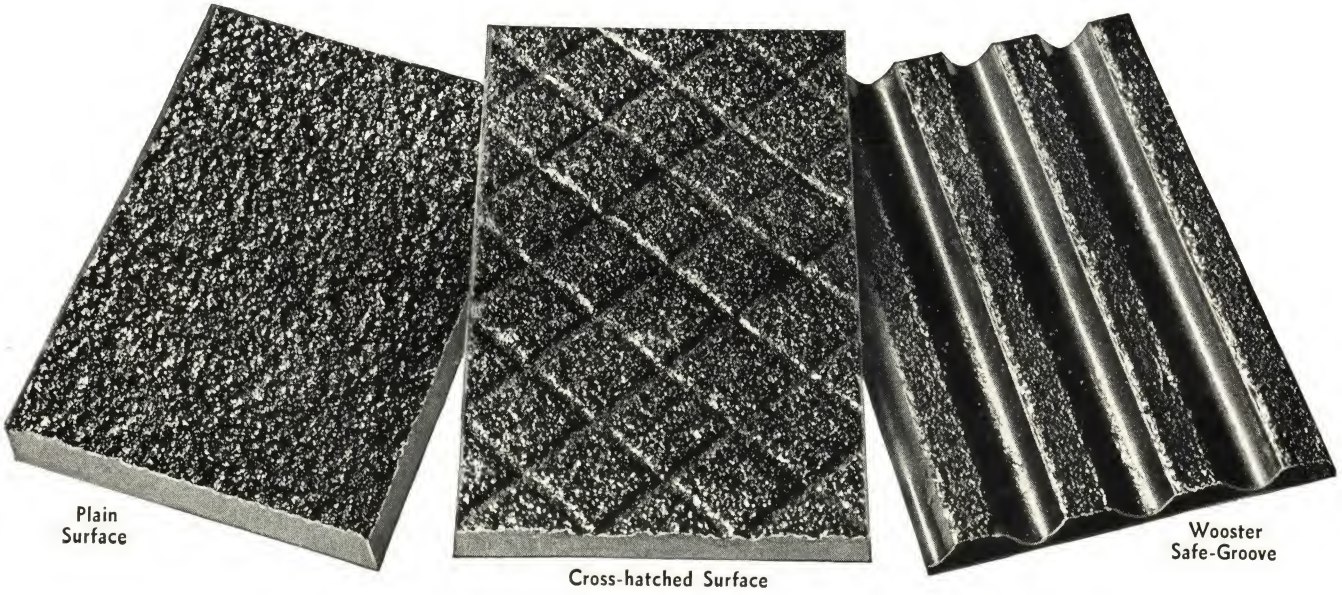
Design—Wooster Safe-Groove Tread is designed to present a walking surface of broad ribs of wear-resisting anti-slip material alternating with deep, narrow grooves.

This design offers to the foot just the proper amount of anti-slip resistance to be of maximum efficiency. The anti-slip ribs, extending clear to the bottom of the tread, are held in dovetailed recesses so that the area of the anti-slip material increases as the tread wears down after years of use, and the safety factor increases in proportion to the rate of wear.

Foreign substances, such as matches, dirt and other particles that cause the foot to slip or roll when stepped on, are immediately deposited in the open grooves, leaving the anti-slip surface clean and effective at all times.

Material—Wooster Safe-Groove Tread is fabricated in either black steel or highly polished yellow brass base.

Anti-slip fillers may be of lead or abrasive grits (aluminous oxides) mixed to just the proper density for maximum safety and wearing qualities.



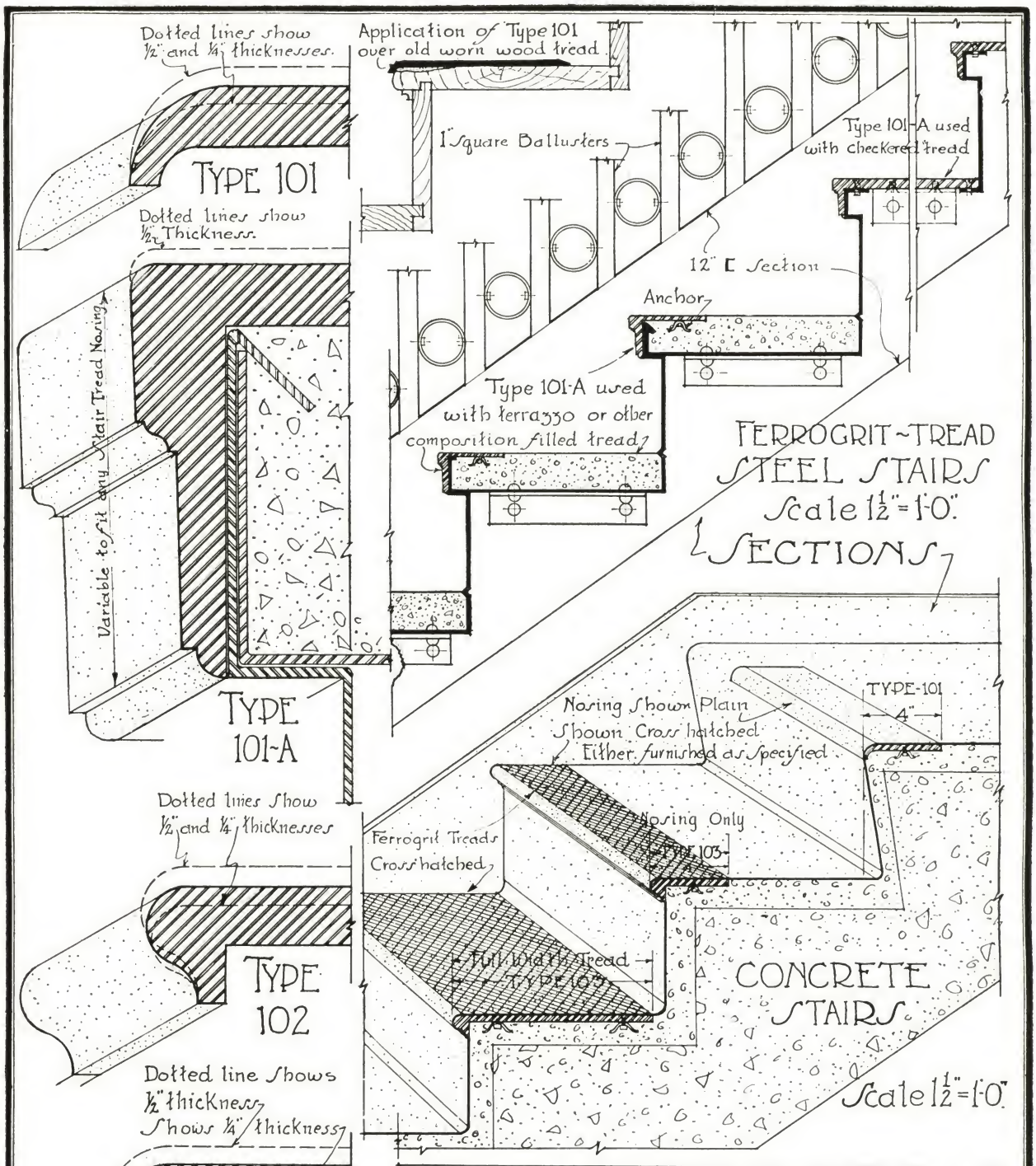


TABLE of STANDARD THICKNESSES

WIDTH & LENGTH		TYPE 101	TYPE 101A	TYPE 102	TYPE 103
Up to 4½"	Not over 6'0"	¼" thick	⅜" thick	¼" thick	¼" thick
4½" to 9½"	" 9'0"	5/16" "	7/16" "	5/16" "	5/16" "
9½" to 15"	" 9'0"	⅜" "	½" "	⅜" "	⅜" "
15" to 20"	" 9'0"	7/16" "	½" "	7/16" "	7/16" "
20" to 24"	" 9'0"	½" "	9/16" "	½" "	½" "

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FERROGRIT TREADS & NOSINGS. WOOSTER PRODUCTS INC. WOOSTER, OHIO. PLATE 1.

Printed in U.S.A.

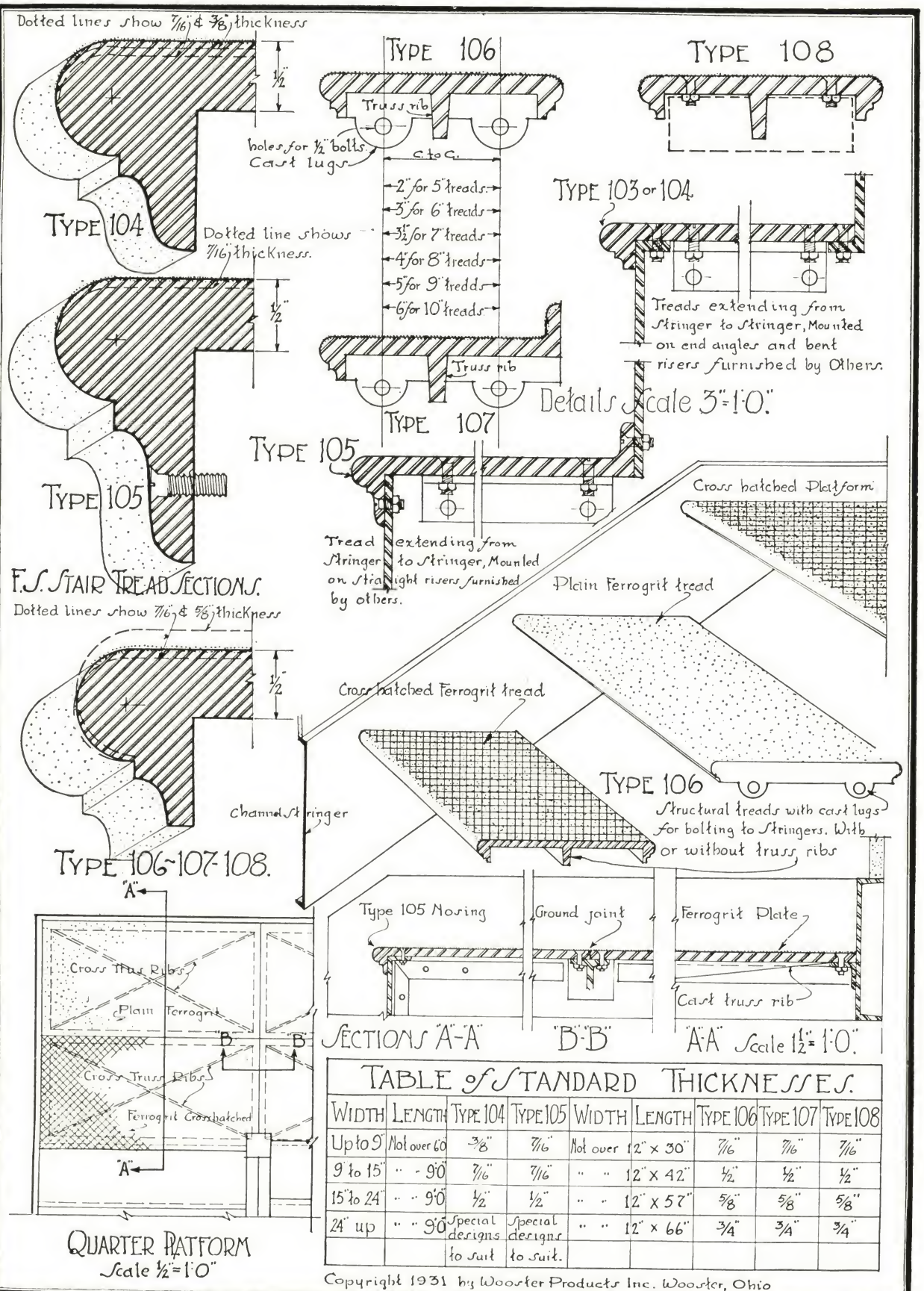

TABLE of STANDARD THICKNESSES.

WIDTH	LENGTH	TYPE 104	TYPE 105	WIDTH	LENGTH	TYPE 106	TYPE 107	TYPE 108
Up to 9"	Not over 6'0	3/8"	7/16"	Not over	12" x 30"	7/16"	7/16"	7/16"
9" to 15"	" " 9'0	7/16"	7/16"	" "	12" x 42"	1/2"	1/2"	1/2"
15" to 24"	" " 9'0	1/2"	1/2"	" "	12" x 57"	5/8"	5/8"	5/8"
24" up	" " 9'0	Special designs to suit	Special designs to suit.	" "	12" x 66"	3/4"	3/4"	3/4"

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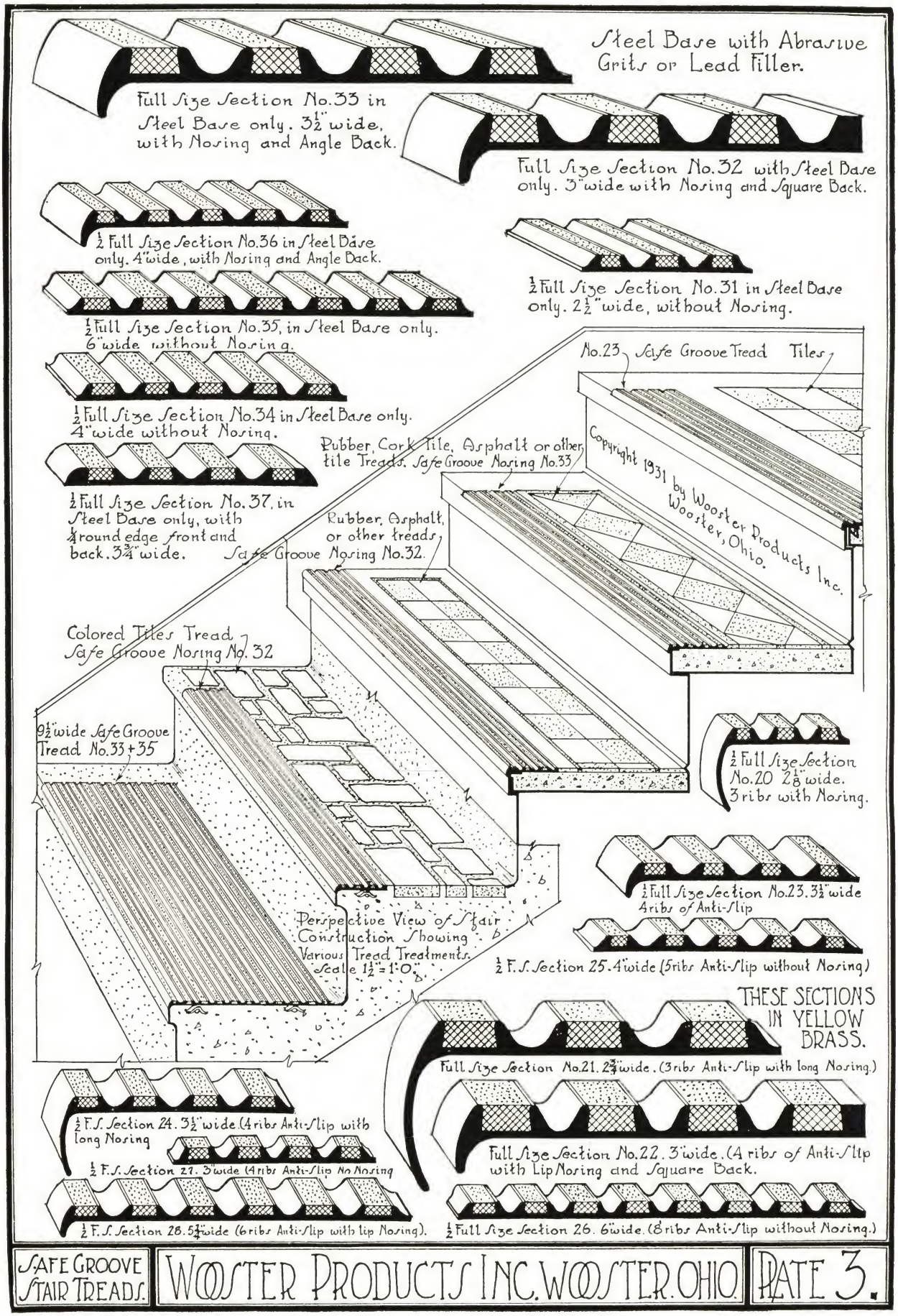
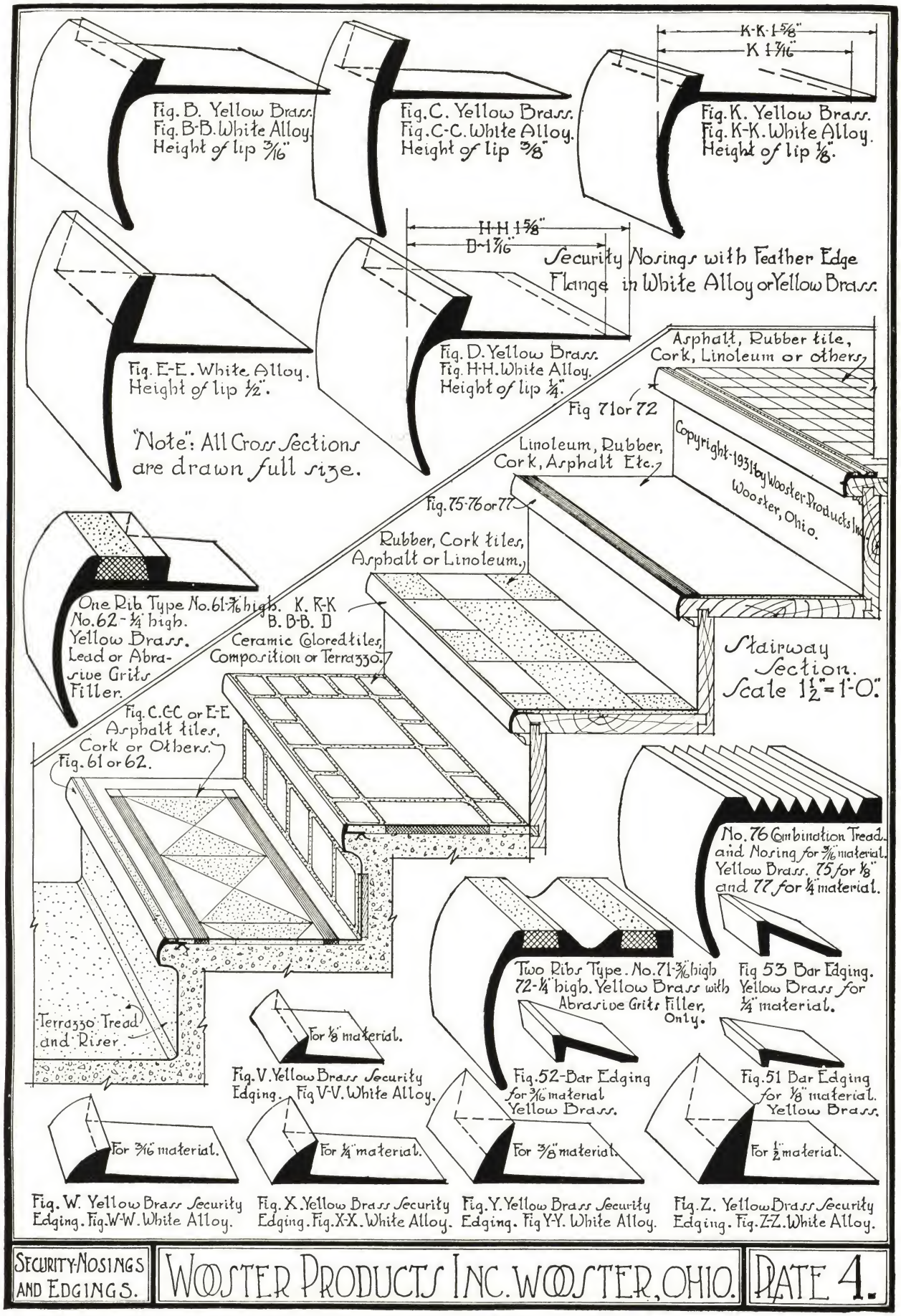
STRUCTURAL FERROGRIT-TREADS | WOOSTER PRODUCTS INC. WOOSTER, OHIO. | PLATE 2.

Printed in U.S.A



SAFE GROOVE STAIR TREADS. WOOSTER PRODUCTS INC. WOOSTER. OHIO. PLATE 3.



SECURITY NOSINGS AND EDGINGS. WOOSTER PRODUCTS INC. WOOSTER, OHIO. PLATE 4.

STANDARD SAFETY TREAD CORP.

Manufacturers of Stair Treads, Nosings, Floor Edgings and Door Saddles

One Madison Avenue
NEW YORK, N. Y.

STANDARD NON-SLIP STAIR TREADS AND DOOR SADDLES

Standard Non-Slip Stair Treads and Door Saddles are made of cast iron or bronze, with flat wearing surface of hard abrasive mixture. The wearing surface is not superficial but extends down to the base. The design of the nosing insures unusual depth of abrasive at this point, where the wear is greatest. The absence of deep grooves and corrugations give more non-slip surface and eliminates all chances of shoe catching and tripping the wearer.

Type A Stair Tread with Lip Nosing, 3 Ins. Wide

Non-Slip Stair Tread

Stair tread is made in any shape or size practical for casting and is drilled ready to attach.

Anchors provided for new concrete, when desired.

Elevator Door Saddles

Elevator Door Saddle, Type V-2, machine planed slots for door guide.

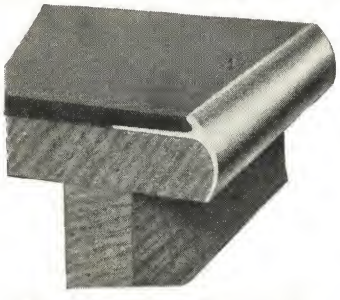
Made to suit door opening and with lugs for attaching to steel.

STANDARD PROTECTIVE STAIR NOSING AND FLOOR EDGING

"Protective" Stair Nosing

Designed to protect the front edges of steps and platforms, used in conjunction with linoleum, cork, rubber tile, mastic and similar floor coverings.

The extreme wide flanges also insure successful installation not only on wood but also on marble, slate or stone steps as well, without danger of breaking the front edges in drilling screw-holes.



"Protective" Stair and Wood Step

Furnished in both yellow *brass* and *white* metal aluminum with hardening alloy, for use with 1/8, 3/16, 1/4, 3/8 and 1/2-in. flooring material.

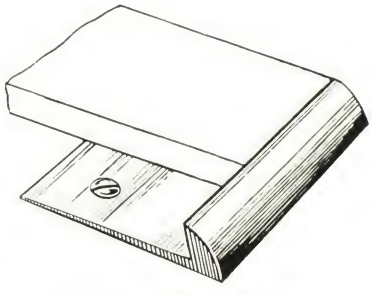
"Protective" Floor Edging

Designed to protect the edges of linoleum, rubber tile and similar flooring materials at door entrances, aisle passageways, table and desk tops, etc.

The flanges reinforce the edging in such a manner that it lies level at all stages of wear and all unsightly screws are concealed by the flooring material.

Furnished in yellow brass for use with 1/8, 3/16 and 1/4-in. flooring materials.

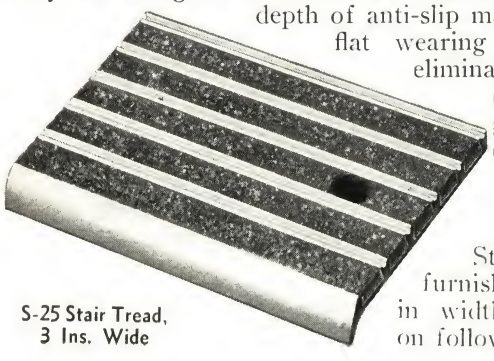
Cut to size and drilled for flat head screws.



"Protective" Floor Edging

STANDARD "SURE-GRIP" STAIR TREADS AND NOSINGS

"Sure-Grip" Stair Treads and Nosings are made of extruded polished brass base with hard abrasive filler. They are designed to insure the maximum area and depth of anti-slip material with a flat wearing surface, by eliminating smooth deep metal grooves and corrugations.



S-25 Stair Tread, 3 Ins. Wide

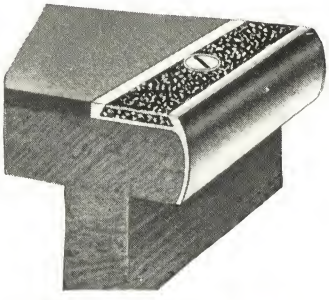
"Sure-Grip" Stair Tread

Stair Treads is furnished 1/4 in. thick in widths as shown on following page.

"Sure-Grip" Stair Nosings

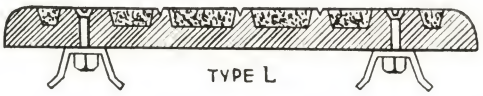
Stair Nosings, S-28 3/16 in. thick and S-29 1/4 in. thick, used with floor covering materials, such as linoleum, rubber and asphalt tile, etc., protects the front of the steps and flooring material and provides a firm foothold against slipping.

Cut to length with countersunk holes properly spaced through metal sleeve in carborundum abrasive surface.

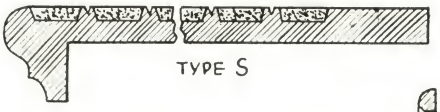


S-28 Stair Nosing on Wood Strip

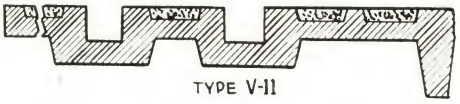
TYPE A



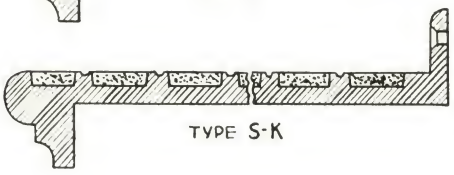
TYPE L



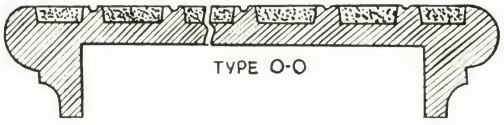
TYPE S



TYPE V-11



TYPE S-K



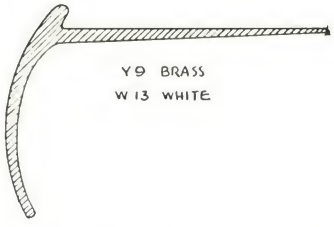
TYPE O-O

STANDARD NON-SLIP TREAD

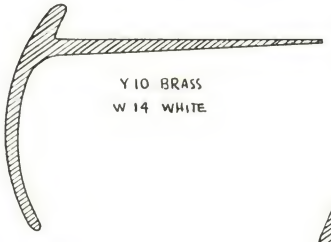
PATENTED

TYPE A WITH SPECIAL NOSING

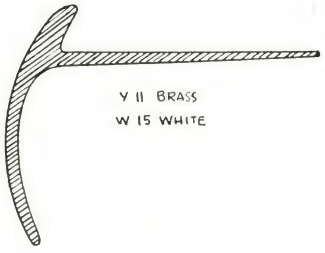
CAST IRON *or* BRONZE BASE..



Y 9 BRASS
W 13 WHITE

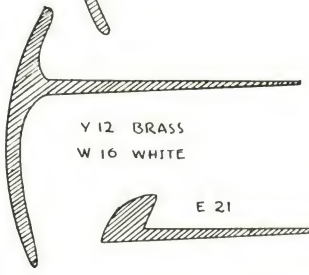


Y 10 BRASS
W 14 WHITE

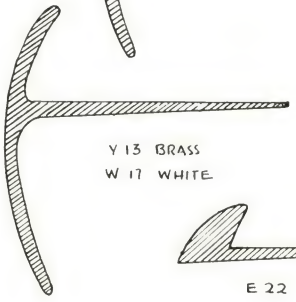


Y 11 BRASS
W 15 WHITE

STANDARD PROTECTIVE NOSINGS & EDGINGS..

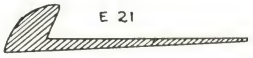


Y 12 BRASS
W 16 WHITE



Y 13 BRASS
W 17 WHITE

E 20



E 21

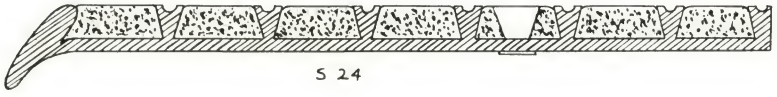
E 22

ACTUAL SIZE

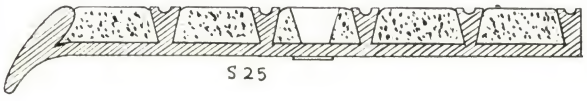
SURE-GRIP TREAD & NOSING..

BRASS BASE

PATENTED



S 24



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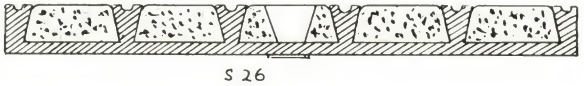

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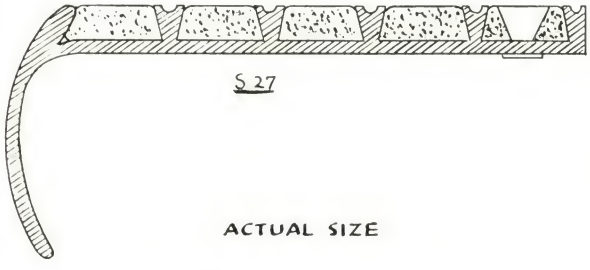

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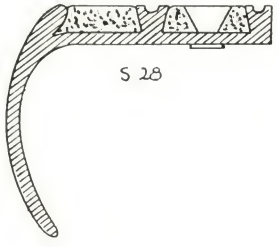

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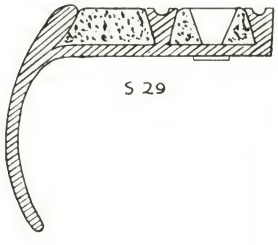


S 29

ACTUAL SIZE

UNIVERSAL SAFETY TREAD, INC.

111 Perry Street
LOWELL, MASS.

Products

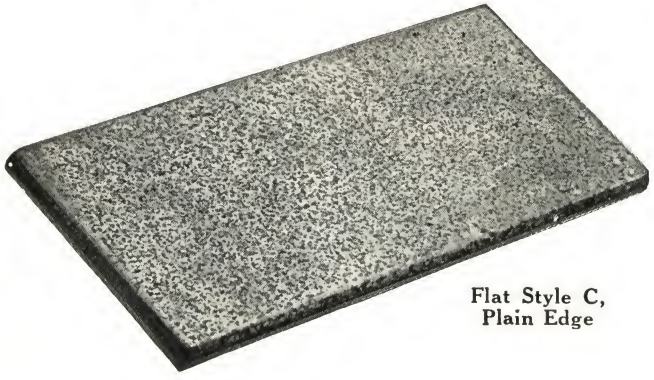
UNIVERSAL ANTI-SLIP METAL TREAD (Abrasive) Type I.
UNIVERSAL SAFETY TREAD (Lead filled) Type II.
UNIVERSAL BRASS and ALUMINUM NOSINGS.
UNIVERSAL BRASS and ALUMINUM DOOR SADDLES.
UNIVERSAL STEEL DOOR SADDLES.

Universal Anti-Slip Metal Tread, Type I

Universal Anti-Slip Metal Tread, Type I, is constructed of a tinned steel baseplate to which is attached the hardest known abrasive with a soft lead binder. The diamond hard grains being embedded throughout the entire thickness of the tread to the baseplate not only makes it slip-proof for its entire life but prevents the foot from being exposed to any hard metal surface. The lead is simply used as a binder and filler between the abrasive grains.

Corrugated Style A, Plain Edge

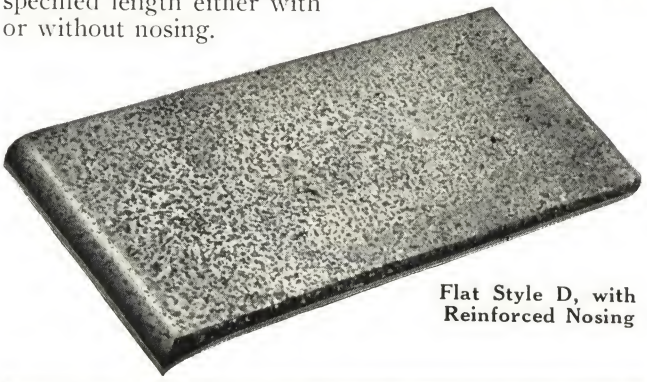
Corrugated Style B, with Lip Nosing



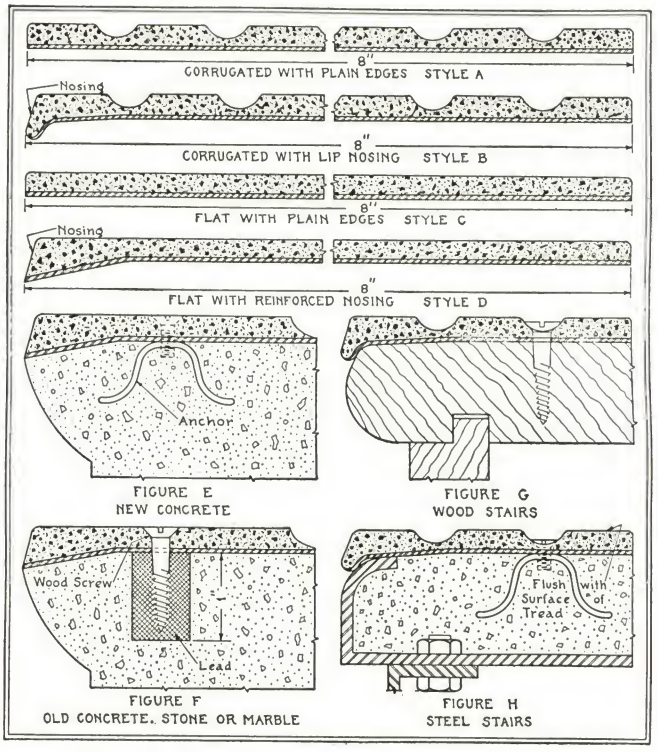
Flat Style C, Plain Edge

It is *fireproof, scuffproof, non-porous, noiseless,* neat in appearance and affords practically positive immunity from slipping. Anti-slip treads can be furnished in a flat or corrugated form to meet specified requirements.

Sizes—Universal Anti-Slip Tread, Type I, can be furnished in any standard width up to 8 in. and in any specified length either with or without nosing.



Flat Style D, with Reinforced Nosing



Universal Safety Tread, Type II

Universal Safety Tread, Type II, is constructed of a steel, brass, aluminum or stainless steel baseplate, punched to receive non-slip lead inserts which are rolled in and firmly clamped. The lead fills the perforations and a non-slip surface is presented for its full thickness. There are no continuous metal ribs on the outer edge, which is the danger point on all stairs, but the lead, being exposed between the steel or brass teeth, presents a non-slip edge at all times. This is especially important in descending stairways. A minimum of hard supporting metal and the maximum of non-slip lead form the wearing surface.

Baseplate can be extended to form a nosing of any depth required which is especially desirable where evidences of repair are to be covered. We can furnish alloy-coated, galvanized steel or stainless steel to resist the action of salt water or dampness. The advantages of Universal Stainless Steel Safety Tread are most obvious, combining the utmost in lasting appearance with durability. Our brass treads are also recommended where it is necessary to have a rustproof and safe surface.

Sizes—Universal Safety Tread, Type II, can be furnished in almost any standard width and in any specified lengths, either with or without nosing according to the requirements of the stairs or landings.

Corrugated Style A, with Plain Edge

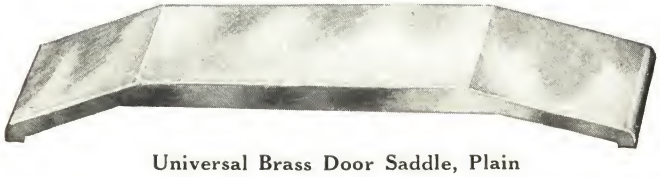
Corrugated Style B, with Nosing

Universal Brass Door Saddles

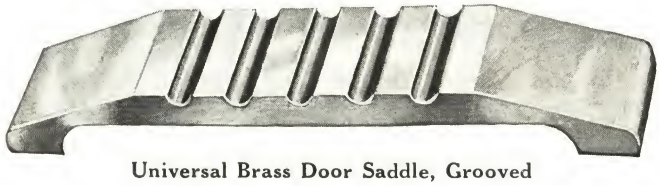
Universal Brass Door Saddles are made by the extrusion process of the highest quality brass. Furnished in either a plain or grooved surface in 4, 5 and 6-in. widths over-all and cut to any required length up to 12 ft. Polished or brush (satin) finish as specified. All brass door saddles are ½ in. high.

Universal Aluminum Door Saddles

Made of the highest quality aluminum, similar in construction to the brass door saddles. Furnished only with the grooved surface in 4, 5, and 6 in. over-all widths, and cut to lengths required up to 12 ft. All aluminum door saddles are ⅝ in. high, with polished or brush (satin) finish as specified.



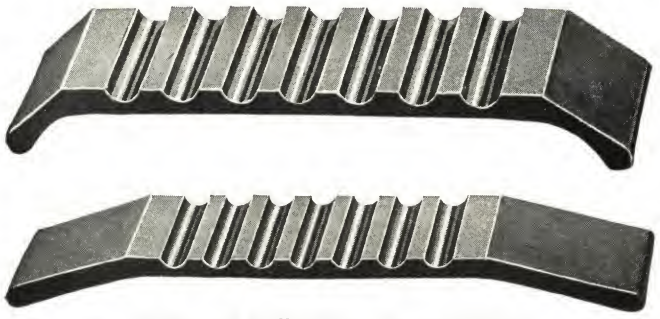
Universal Brass Door Saddle, Plain



Universal Brass Door Saddle, Grooved

Universal Rolled Steel Door Saddles

Universal Rolled Steel Door Saddles are furnished in the corrugated type only. They are especially recommended for exterior use or in any place where a heavy duty saddle is required. Cut and drilled in any length up to 16 ft. 4-in. width, $\frac{9}{16}$ in. high. 5½-in. width, ⅝ in. high.



Universal Rolled Steel Door Saddles

Universal Brass and Aluminum Nosings

Universal Nosings are made of highly polished yellow brass and silvery white non-corrosive aluminum and are designed to safeguard the front edge of steps and platforms when used in combination with other floor coverings. Furnished in any lengths up to 14 ft.

Styles of Universal Brass and Aluminum Nosings Details—Full Size

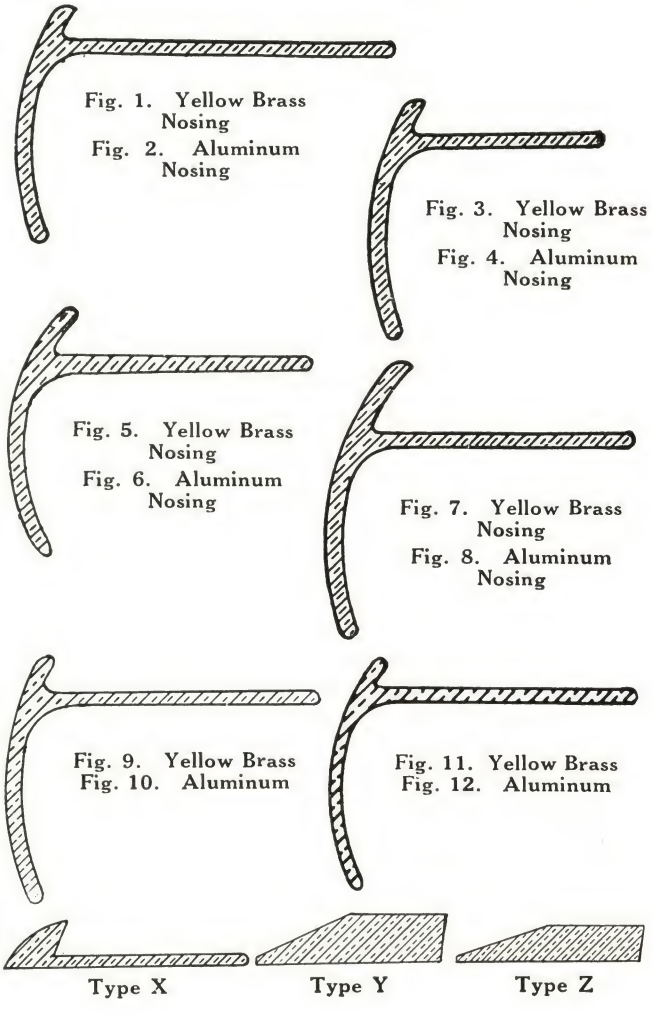


Fig. 1. Yellow Brass Nosing
Fig. 2. Aluminum Nosing
Fig. 3. Yellow Brass Nosing
Fig. 4. Aluminum Nosing
Fig. 5. Yellow Brass Nosing
Fig. 6. Aluminum Nosing
Fig. 7. Yellow Brass Nosing
Fig. 8. Aluminum Nosing
Fig. 9. Yellow Brass
Fig. 10. Aluminum
Fig. 11. Yellow Brass
Fig. 12. Aluminum
Type X
Type Y
Type Z

ESTABLISHED 1909

BABCOCK-DAVIS CORPORATION

Manufacturers of Steel Flag Poles

474 Dorchester Avenue
BOSTON, MASS.

For Mortuary Racks, see Manufacturers' Index

Construction and Advantages of BABCOCK-DAVIS EASY ACCESS POLE

U. S. Patent No. 1665535, April 10, 1928

25-ft. B-D Pole, H. P. Hood Co. Building, Charlestown, Mass.

Principle of the Easy Access Pole Design

It is designed to overcome the expense and difficulty often experienced in replacing fouled and broken halyards as well as making it easy to erect and paint at all times. Every pole should be thoroughly inspected at least once a year. No steeplejack is required to do this with the Easy Access pole as one man can raise or lower the pole in a few minutes. Operating a worm gear by a ratchet wrench raises or lowers the pole or holds it stationary at any angle desired, making it possible to incline pole over a parapet.

Economy

The saving in erection together with a yearly inspection and painting will offset the additional cost over that of the plainest type of pole.

It is readily installed on all types of frame or fireproof roof construction and for grade installations in grounds of schools, public buildings, parks, private estates, etc. For grade installation, a monumental cast iron or bronze base can be supplied to cover the operating mechanism, to which tablets or inscriptions can be attached.

The Patented Easy Access Base Construction

One of the principal features of the base is that the base plate and web plates are integral and installed as one. By this method no special requirements for long braces or extra flashings are required. The comparatively small and inconspicuous base is set on an island raised above the roof as shown in the details on the following pages and is built in with the roof construction.

The base also contains the worm which operates the gears of the quadrant on the bottom of pole when worm is turned by removable ratchet wrench supplied with pole.

The heavily galvanized base plate is drilled to receive anchor bolts installed according to shop drawings supplied by us. It is set in plastic cement and bolted to roof construction, then roofing material is carried over it and thoroughly flashes the base.

The island type of construction which we use with our poles is the most advanced method of setting flag poles and it is readily seen why there has never been a leaky roof where one of our bases is installed.

We do not furnish the anchor bolts.

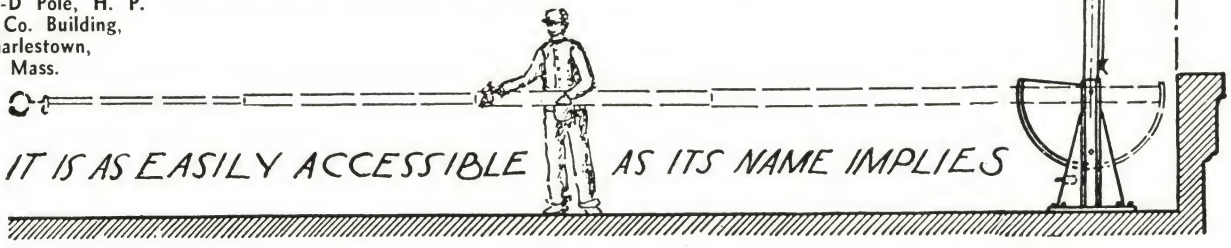
Pole Construction

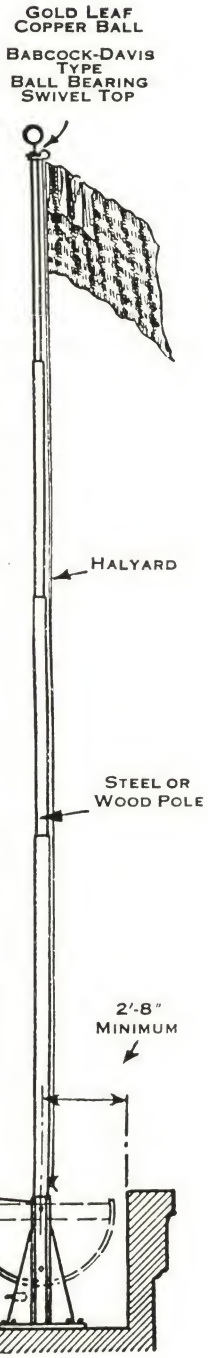
Pole is constructed from pipe or copper bearing steel tubing in sizes graduated to give a graceful taper. Sections are shrunk and welded together so all joints are waterproof. Field joints where required are readily made. Upper pieces rest on heavy supports and are aligned by setscrews, then calked or welded in the field. The poles are open at the bottom and vented through cap, but no water can enter the pole. This ventilation prevents condensation and rusting on inside of pole.

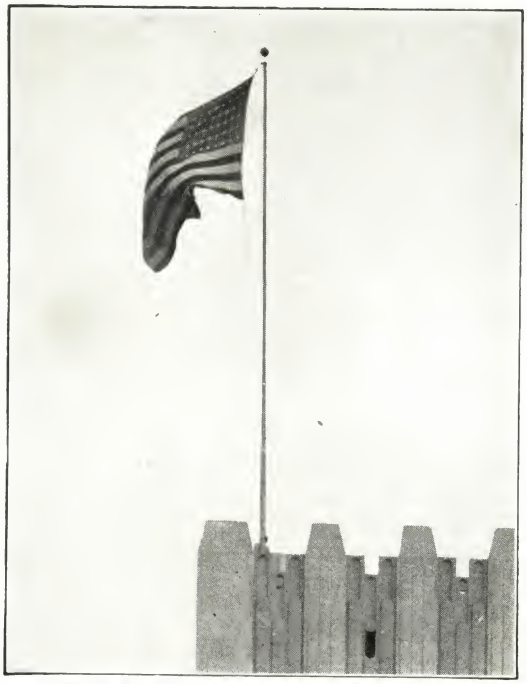
Specification

Furnish and erect Babcock-Davis Easy Access Pole .... ft. high (if canted, specify degree of angle), equipped with (6, 8 or 10-in.) 22-karat gold leafed copper ball, ball bearing swivel top, continuous braided cord halyards, with invisible connector, cleat, and operating ratchet wrench as manufactured by Babcock-Davis Corporation, 474 Dorchester Avenue, Boston, Mass.

Note: For roof installation specify forming of island as shown in details to take base and building-in of anchor bolts. If on ground specify foundations and height carried above surface of ground and bolts located according to shop drawings supplied by us.

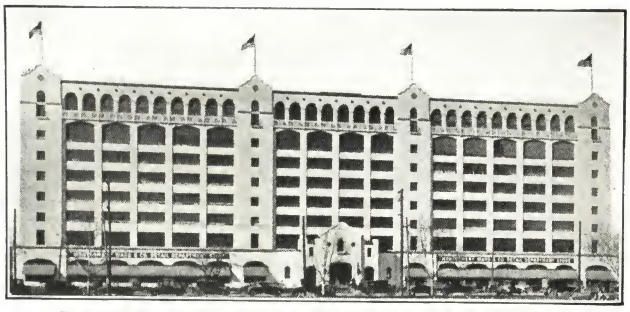




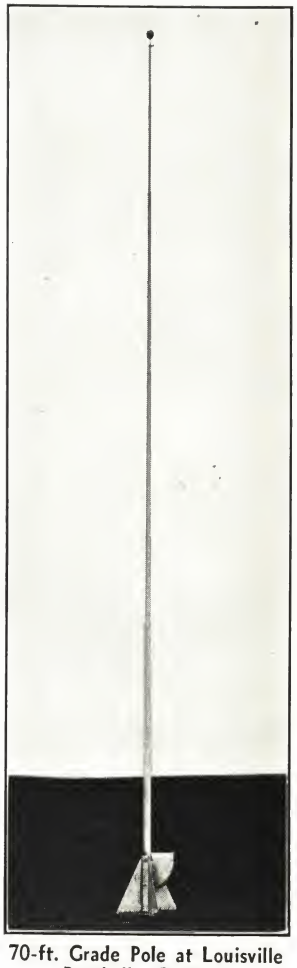


50-ft. Roof Pole on American Bank Building, New Orleans, La.
M. H. Goldstein, Architect

50-ft. Grade Pole at the William Carter Residence, Needham, Mass.



Four 40-ft. Roof Poles on Montgomery Ward Building, Fort Worth, Tex.



70-ft. Grade Pole at Louisville Baseball Grounds, Louisville, Ky.

A FEW INSTALLATIONS OF BABCOCK-DAVIS EASY ACCESS POLES

Cadillac Building, Boston, Mass.
Jewelry Building, Providence, R. I.
Gas & Electric Real Estate Trust Co., Malden, Mass.
High School, Brownsville, Tex.
Hawkins Street Edison Station, Boston, Mass.
A. G. Spalding & Bros., Chicopee, Mass.
Granite Trust Co., Wollaston, Mass.
Montgomery Ward, Fort Worth, Tex.
Malden & Melrose Gas Co., Stoneham, Mass.
Salvation Army Building, Springfield, Mass.
San Angelo Junior College, San Angelo, Tex.
Public Service Building, Boston, Mass.
Buffalo-Ammonia Company, Brooklyn, N. Y.
Board of Water & Light Building, Lansing, Mich.
Brighton Savings Bank, Brighton, Mass.
Toolen High School, Mobile, Ala.
William Carter Residence, Needham, Mass.
S. H. Kress Co., Spartanburg, S. C.
First National Bank, Plainfield, N. J.
John Deere School, East Moline, Ill.
H. P. Hood & Sons, Charlestown, Mass.
Cadillac Garage, Bridgeport, Conn.
Needham National Bank, Needham, Mass.
People's Trust Co., South Norwalk, Conn.
Sunfast Hats Co., East Norwalk, Conn.
S. H. Kress Co., Laredo, Tex.
Star Building, Washington, D. C.
North Station Industrial Building, Boston, Mass.
Flagg Storage Warehouse, Syracuse, N. Y.
State Trade School, Hartford, Conn.
S. H. Kress Co., Wichita, Kan.
Brooks Transfer Co., Richmond, Va.
American Bank Building, New Orleans, La.
Plymouth National Bank, Plymouth, Mass.
First National Bank, Salem, Ohio
First National Bank, Mamaroneck, N. Y.
Montauk Yacht Club, Montauk, N. Y.
Asbury Park Theatre, Asbury Park, N. J.
S. H. Kress Co., Elizabethton, Tenn.
Leland Parker Hotel, Minot, N. D.
Green Acres Farm, North Madison, Conn.
S. H. Kress Co., Tampa, Fla.
Edison Garage, Hyde Park, Mass.
First National Stores, Hartford, Conn.
West Albany School, Albany, N. Y.
S. H. Kress Co., Montgomery, Ala.
St. Patrick's School, Stoneham, Mass.
Sawyer Lumber Co., Worcester, Mass.
Abraham & Straus Department Store, Brooklyn, N. Y.
Swift & Co., Kansas City, Kan.
State Armory, New Haven, Conn.
Louisville Baseball Grounds, Louisville, Ky.
Beverly Gas & Electric Co., Beverly, Mass.
Municipal Building, Coraopolis, Pa.
Monroe Township School, Continental, Ohio
Schaefer Warehouse, Stamford, Conn.
R. I. Hospital Trust Co., Woonsocket, R. I.
Negro Y. M. C. A., Dallas, Tex.
Dreyfuss & Sons Store, Dallas, Tex.
Savings Bank of Newport, Newport, R. I.
S. H. Kress Co., Colorado Springs, Colo.
Armory, Dover, N. H.
S. H. Kress Co., Pueblo, Colo.
School, St. Augustine's Group, Washington, D. C.
District Court Building, Springfield, Mass.
Scotia Street Edison Station, Boston, Mass.
James Webb Store, Grand Island, Neb.
Everett Savings Bank, Everett, Mass.
Ohio Bell Telephone Co., Dayton, Ohio
First National Bank, Lindenhurst, L. I., N. Y.
Herald Building, Boston, Mass.
Edison Office Building, Boston, Mass.

STANDARD SIZES AND EQUIPMENT OF EASY ACCESS POLES

The standard sizes of the Easy Access Poles are illustrated below. Sizes 20, 25, 30, 35, 40 and 50 ft. are carried in stock, other lengths are made to order and shipped on short notice.

The poles and bases are finished with one coat of red lead and two coats of aluminum paint. The base plate is heavily galvanized, which prevents any chance of rusting after it is flashed in with the roofing. The entire pole can be supplied galvanized. Also made of aluminum or bronze.

Raised Position

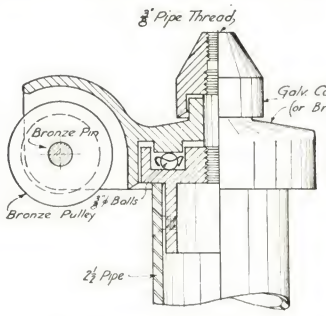
Illustrations show standard base with pole in raised and lowered positions and the removable ratchet wrench.
Patented April 10, 1928. No. 1665535

Standard Equipment

All Easy Access poles are equipped with 22-karat gold leafed copper ball, in 6, 8 or 10-in. size, B-D ball bearing swivel top, continuous braided cord halyards with invisible connector (this prevents undue strain on flag), cleat, flag snaps, and ratchet wrench for raising or lowering the pole. Eagle and arrows can be supplied at an extra charge.

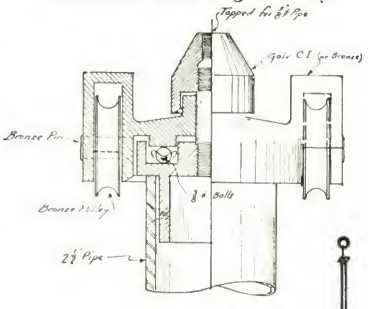
Ball Bearing Flag Pole Tops

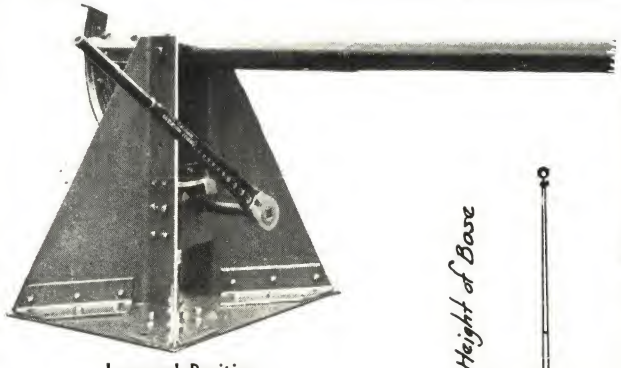
Details of ball bearing halyard tops show how carefully they are made. Ball bearings are packed in grease. Pulley is of bronze on bronze pin, preventing it from freezing in body. Body is cast iron, galvanized inside and out; will not rust or deteriorate.



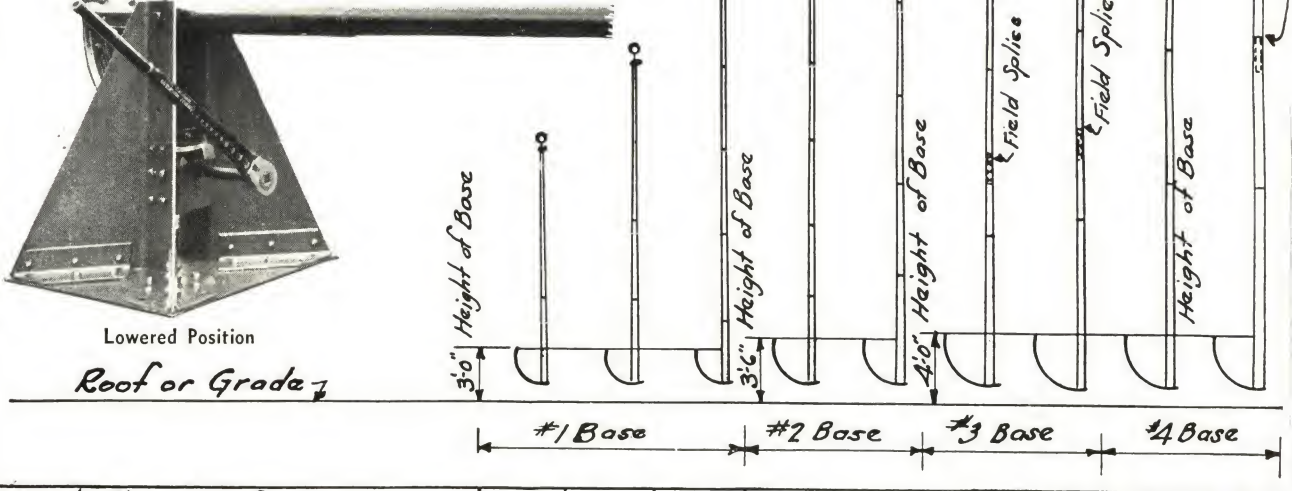
Left: **Standard Single Flag Pole Top**

Below: **Standard Double Flag Pole Top**





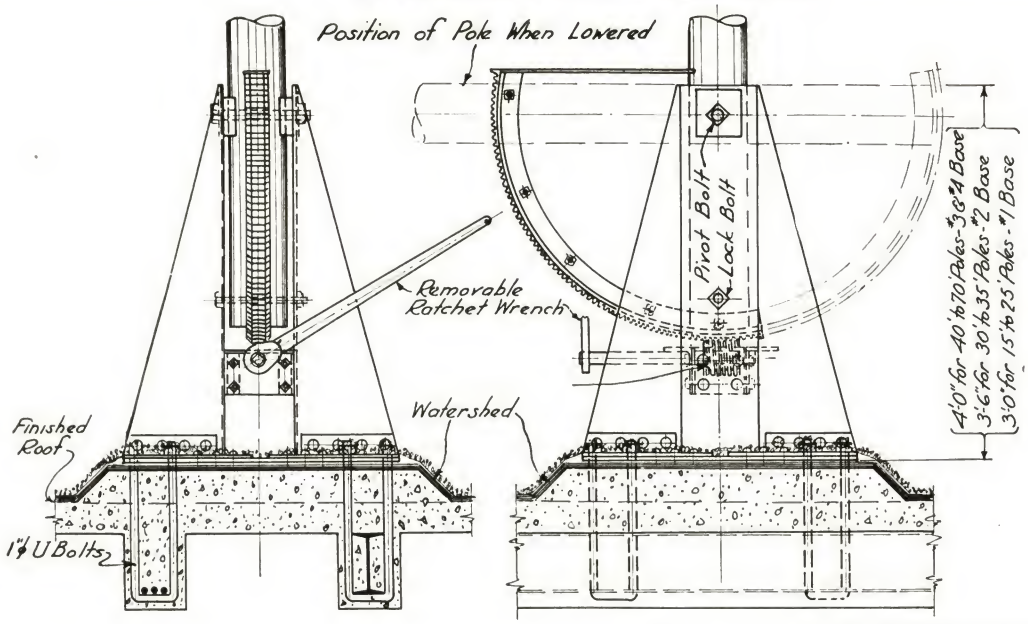
Lowered Position

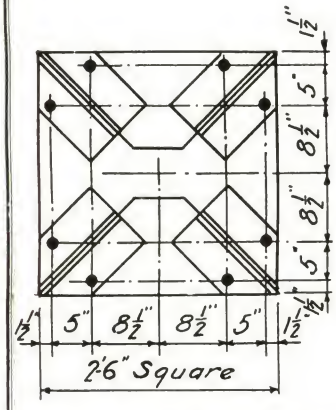


Height Above Roof or Grade	15'	20'	25'	30'	35'	40'	50'	60'	70'
Outside Dia. of Top Section	2 3/8"	2 3/8"	2 3/8"	2 3/8"	2 3/8"	2 7/8"	2 7/8"	2 7/8"	2 3/8"
Outside Dia. of Bottom Section	3½"	4"	4½"	5"	5"	6 5/8"	6 5/8"	7 5/8"	7 5/8"
Dia. of Gold Leafed Copper Ball	6"	6"	6"	6"	6"	8"	8"	10"	10"
Weight of Pole	100	160	210	305'	335	650	775	1225	1425
Weight of Base & Quadrant	350	350	350	475	475	775	775	1250	1250
Total Shipping Weight	450	510	560	780	810	1425	1550	2475	2675
Number of Shipping Sections of Pole	One	One	One	One	One	2	2	2	3

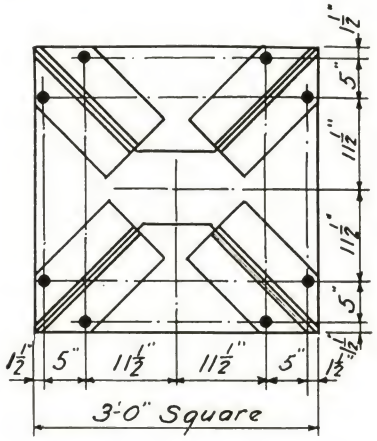
The above table gives dimensions and weights for standard sizes of poles, bases and fittings.

STANDARD ROOF ANCHORAGE

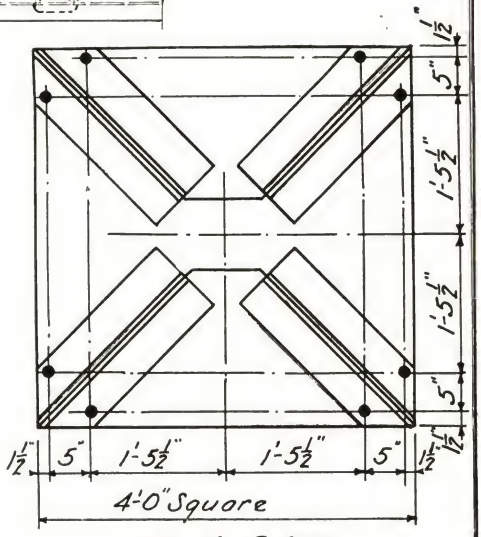




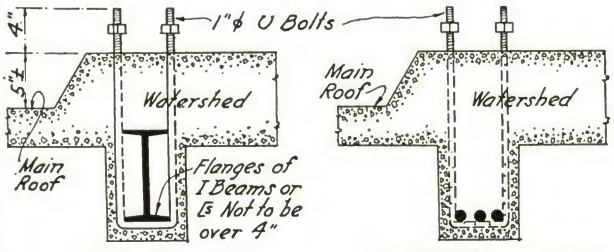
NOS. 1 AND 2 BASE FOR 15 TO 35-FT. POLES

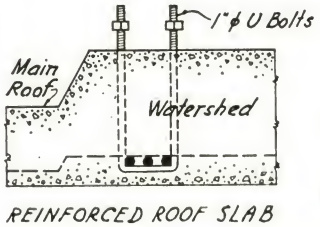


NO. 3 BASE FOR 40 TO 50-FT. POLES

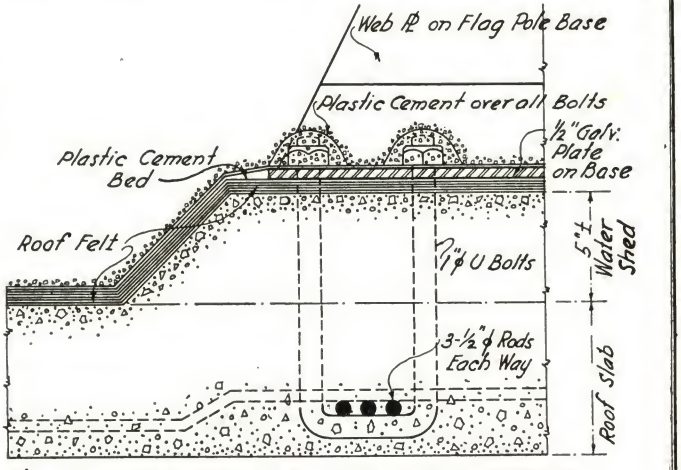


NO. 4 BASE FOR 60 TO 70-FT. POLES





DETAILS SHOWING SPACING OF BOLTS FOR BOLTING TO ROOF



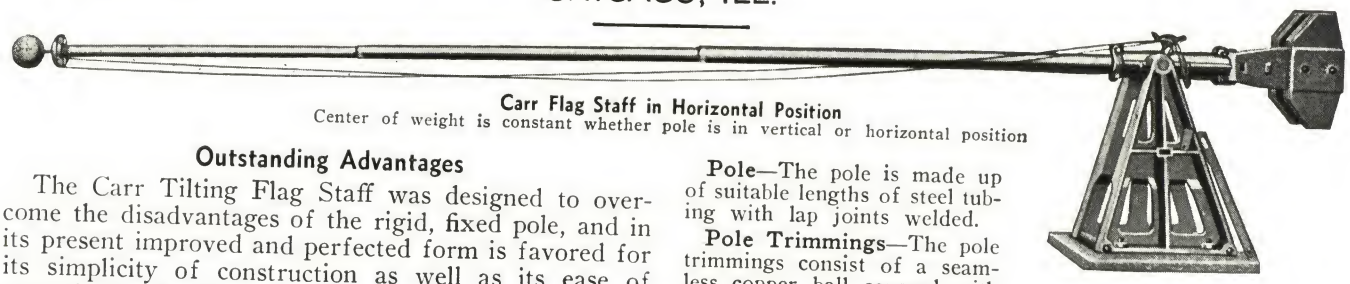
1½-IN. SCALE DETAILS SHOWING METHOD OF SECURING ANCHOR BOLTS TO CONCRETE ROOF CONSTRUCTION

ELMER E. CARR

Manufacturer of the Carr Tilting Flag Staff

TELEPHONE
Franklin 5320

228 No. La Salle Street
CHICAGO, ILL.



Carr Flag Staff in Horizontal Position
Center of weight is constant whether pole is in vertical or horizontal position

Outstanding Advantages

The Carr Tilting Flag Staff was designed to overcome the disadvantages of the rigid, fixed pole, and in its present improved and perfected form is favored for its simplicity of construction as well as its ease of operation and maintenance.

It is the pioneer in its line. The counterbalance feature was adopted after consideration had been given to various designs having mechanical means of bringing the pole to a horizontal position. This entirely obviates all likelihood of parts failing or wearing out, with danger of serious accident. Careful thought given to this feature will insure its adoption.

Counterbalanced—Each unit is provided with adequate counterweight to balance the pole proper, which is secured in a substantial socket provided with steel trunnions to engage in the standard or supporting brackets, the brackets being permanently attached to the roof or foundation. When the pole is lowered or raised the roof load is unchanged.

Repainting, inserting new halyards, etc., are accomplished with the utmost ease and economy. There are no mechanical parts, no gearing or levers to fail. One man can lower the pole by removing the key and locking bar, exerting slight pressure against the counterweight, and bringing the pole (always under control) with little effort to the horizontal. It is returned to the vertical with equal facility.

Simple Pole Support Construction—Due to the low point of gravity, only an ordinary foundation to receive the anchor bolts is necessary and a roof construction adequate to carry the weight of the unit. The supporting castings provide a rigid and sturdy anchorage without the usual "pull and tug" effect of an ordinary pole attached to the roof with structural shapes.

Economy of Erection—Erection is simply and inexpensively accomplished. After the supporting castings are set on the foundation bolts and the pole socket castings in place and shored in a horizontal position, the pole is inserted and bolted in the socket, the counterweights are then bolted in position and the trimmings attached to the top of the pole; the shoring is then removed and the counterweighted pole is easily raised to a vertical position and the locking bar inserted and keyed in place. The parts are raised to the roof with the usual facilities provided for construction work. Once on the roof, the unit, according to size, can be erected complete by two or three men in one and one-half to three hours.

Construction

Base—The supporting structure is of cast iron, which is recognized as better able to withstand the elements than structural shapes.

Socket—The pole socket is of cast iron, with steel trunnions cast in position, and the counterweights also are of cast iron.

Locking Bar—The locking bar and key are of heavy steel.

Pole—The pole is made up of suitable lengths of steel tubing with lap joints welded.

Pole Trimmings—The pole trimmings consist of a seamless copper ball covered with gold leaf; a truck with two bronze pulleys; a brass nipple for connecting ball to truck; a cleat; and a halyard of good quality with snap hooks.

Workmanship—All workmanship is of the highest character. The castings are clean and free of defects.

Painting—All steel and cast iron are given one shop coat of paint.

Sizes

No. 0—20 ft.—for buildings 1 to 3 stories high.

No. 1—25 ft.—for buildings up to 10 stories high.

No. 2—32½ ft.—for buildings up to 16 stories high.

No. 3—40 ft.—for buildings up to 24 stories and higher.

Service

The manufacturer will co-operate in planning settings to suit various building requirements and will furnish drawings on request. Mention SWEET'S ARCHITECTURAL CATALOGUES when writing.

Representative Installations

Illinois Bell Telephone Co., 17 buildings
St. Louis Globe-Democrat Building, St. Louis
Old Merchants National Bank, Battle Creek
Eagles Home Building, Zanesville
Second National Bank, Hamilton
Central National Tower, Battle Creek
Pullman Laundry Building, Chicago
Firestone Tire & Rubber Co., Buenos Aires
North Junior High School, Nashville
Chicago Daily News Building, Chicago
Mayflower Hotel, Akron
Municipal Utilities Building, Colorado Springs
University of Illinois Medical and Dental College Laboratory, Chicago
Brooklyn Union Gas Co., Brooklyn, 2 buildings
Christie-Brown Plant, Winnipeg, Man.
Pennsylvania Power & Water Co., Safe Harbor
Broadway Development Co., Enid
Hinde & Dauch Co., Sandusky and Baltimore
Theater and Commercial Bldg., Milwaukee
Lake View Trust & Savings Bank, Chicago
S. W. Bell Telephone Co., St. Louis
124th Field Artillery Armory, Chicago
Montgomery Ward & Co., Nashville
Des Plaines Post Office, Des Plaines
Bendix Administration Bldg., South Bend
Aetna Life Insurance Bldg., Hartford
Y. M. C. A., Kenosha
Commonwealth Edison Co., Chicago, 33 poles
Ohio Bell Telephone Co., 6 buildings
Federal Reserve Bank, 5 buildings
Civil Court Building, St. Louis, 8 poles
Pennsylvania R. R., Philadelphia, 2 poles

JOHN E. LINGO & SON, INC.

Flagpoles in Copper Bearing Steel, Bronze and Aluminum

TELEPHONE
Camden 487

28th Street and Buren Avenue
CAMDEN, N. J.

ESTABLISHED 1897

FOUR DISTINCT TYPES OF FLAGPOLES

Continuous Straight Tapered Flagpoles

Continuous Straight Tapered Flagpoles are a newly developed product having practically all the characteristics of the original continuous tapered poles and *will be sold at the price of a sectional pole.* They are adaptable for ground setting or roof setting under any condition that a swaged sectional pole would be used. The new straight tapered poles are tapered conically whereas the original continuous tapered poles are tapered with entasis. Continuous Straight Tapered Flagpoles are produced of steel only and have a smooth uninterrupted exterior surface throughout without joints or offsets. They are carried in stock and are standardized in two weights for ground setting or roof setting: Heavy 20 to 100 ft. and Extra Heavy 35 to 100 ft. These poles, up to 65 ft. in length, are shipped in one piece without field joints but if the length exceeds 65 ft. they are shipped in two pieces with a special field joint. The assembling of the two pieces, together with the welding and grinding of the field joint, must be accomplished by the flagpole erector. For further information please refer to pages 2 and 3.

Continuous Entasis Tapered Flagpoles

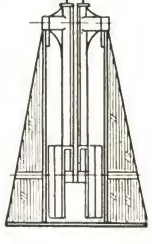
Continuous Entasis Tapered Flagpoles are the original continuous tapered flagpoles. They are produced in copper bearing steel, bronze and aluminum with a smooth uninterrupted exterior surface throughout resembling a finished wood flagpole in contour and appearance. These flagpoles are tapered with Venetian entasis or with entasis as selected by the architect and are more costly than the straight tapered poles. Continuous Entasis Tapered Flagpoles are especially suitable for memorials, monuments and other buildings of exceptional architectural value, where a prominent flagpole installation is desired to properly harmonize with the architectural design of the project. These flagpoles are not carried in stock and are made to order only. They are, however, standardized in two weights for ground setting or roof setting: Standard 20 to 100 ft. and Sub-standard 20 to 100 ft. Continuous Entasis Tapered Flagpoles are usually shipped in one piece—regardless of length—without field joints, but will be shipped in two pieces providing only that the assembling in the field is accomplished by our own men. For further information please refer to pages 4 and 5.

Swaged Sectional Flagpoles

Swaged Sectional Flagpoles are fabricated in sections of copper bearing steel pipe with swaged, telescoped and shrunk joints without the use of bolts, rivets, pins, screw couplings or lead calking. They are standardized for ground and roof settings in lengths from 15 to 125 ft. These poles are carried in stock, shipped in knock-down sections with patented field joints. The erector merely pushes or telescopes the knock-down sections together at the erection site and after the pole is erected the field joints are made airtight and watertight by calking steel to steel with an ordinary hammer and calking chisel. For further information please refer to page 10.

Equipoise Tilting Flagpoles

Equipoise Tilting Flagpoles are another newly developed product offering distinct advantages and incorporating pole constructions never before available in tilting flagpoles. These poles are intended only for roof setting in localities where experienced painters or steeplejacks are not available to repaint or install halyards in a fixed roof pole. Equipoise Tilting Flagpoles are lighter in total weight and require less roof reinforcement than the usual counterbalanced pole. There are no worm gears or windlass devices which cause tremendous leverage on the roof while the pole is being raised or lowered. By use of a counterweight arrangement on the Equipoise poles the roof load remains unchanged at all times regardless of the position of the pole. For further information please refer to pages 11 and 12.



EXPERIENCE AND SERVICE

For thirty-four years flagpoles have been the exclusive specialty of this company and we believe we are responsible for most of the modern developments and refinements in this particular line.

We want architects to take advantage of the wealth of knowledge we have acquired by this long specialized experience. It is always a pleasure, therefore, to cooperate with you on problems involving the use of flagpoles and will welcome opportunities to offer suggestions and prepare details with specifications, together with estimates of cost, positively free of charge or obligation. Send us a rough sketch or idea of your contemplated flagpole requirements, before finally specifying, and we will promptly assist you in designing the best suited and yet most economical flagpole installation.

A CONTINUOUS TAPERED FLAGPOLE AT THE PRICE OF A SECTIONAL POLE

We now offer to the architect an entirely new development in flagpole construction. In the past the only identified types of steel poles were those of either the swaged sectional or continuous tapered constructions. Our Swaged Sectional Poles, fabricated in sections of steel pipe did not have the same pleasing contour as a wooden pole due to the presence of visible joints. Our original Continuous Tapered Poles, produced with a smooth uninterrupted exterior surface throughout, resulted in a metal pole with the appearance of a wooden pole. The architects have recognized the outstanding features of these Continuous Tapered Poles but the cost of producing them often prohibited their purchase. We have realized the necessity of developing a continuous tapered pole at a much lower cost, so finally after extensive research work we are now offering a new type Continuous Tapered Pole to be sold at the price of Swaged Sectional Poles. These new type poles are known as "Continuous Straight Tapered Poles," whereas our original continuous tapered poles are now known as "Continuous Entasis Tapered Poles."

The manufacture of Swaged Sectional Flagpoles will still be continued regardless of the introduction of the new Continuous Straight Tapered poles which are in the same price range.

CONTINUOUS STRAIGHT TAPERED FLAGPOLES

Continuous Straight Tapered Flagpoles are produced of high grade open hearth steel with a smooth uninterrupted exterior surface throughout resembling a finished wooden flagpole in contour and appearance. They are tapered conically and are made of steel only. The wall thickness is from ¼ to ⅜-in. depending upon the top diameter of the flagpoles as shown in the table of dimensions below. These poles, up to 65 ft. in length, are shipped in one piece without field joints, whereas poles exceeding 65 ft. are shipped in two pieces and assembled at the erection site by means of a field joint which must be welded and ground by the pole erector. Continuous Straight Tapered Flagpoles are standardized in two weights for ground setting and roof setting:

Heavy 20 to 100 ft. Extra Heavy 35 to 100 ft.

They are carried in stock and prompt shipments are assured.

SPECIFICATION "G"—CONTINUOUS STRAIGHT TAPERED FLAGPOLES FOR GROUND SETTING

Furnish and erect a Continuous Straight Tapered Steel Flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, N. J., and build concrete foundation in accordance with their standard details. Flagpole to be ground set [Heavy] [Extra Heavy] type with .... feet exposed height above ground by .... feet total length with a butt diameter of .... inches tapering conically to a top diameter of .... inches. After erection apply over the shop coat of red metal primer two finishing coats of white lead and oil.

Flagpole Construction—The flagpole shall be constructed of open hearth steel of diameters, wall thickness, etc., as standardized by JOHN E. LINGO & SON, INC., for this type flagpole. The flagpole shall have a smooth uninterrupted exterior surface throughout, without visible joints or offsets.

(*Note:* If over-all length of pole is 65 ft. or under include the following: Flagpole to be shipped from factory in one piece without field joints.)

(*Note:* If over-all length of pole exceeds 65 ft. include the following: Flagpole to be shipped from factory in two pieces with one field joint as designed by pole manufacturer. The two pole sections are to be assembled and welded at the erection site by the pole erector.)

Ball—The ball shall be of size recommended by JOHN E. LINGO & SON, INC., for this type flagpole and shall be constructed of 20-oz. copper, covered with Hastings XX gold leaf over three coats of galvanum and one coat of waterproof size. Ball to be mounted on a ¾-in. seamless brass tube and slipped over a ⅝-in. diameter galvanized rod attached to truck.

Truck—(To be used on flagpoles with top diameter up to 3½ in. only.) The truck is to be a "Lingo" standard ball bearing revolving truck, with cast iron body galvanized, revolving on manganese bronze spindle, with top and bottom ball races with twenty-six ¼-in. diameter bronze balls each. Truck to be fitted with two 2⅜-in. diameter bronze roller bushed sheaves for ⅜-in. diameter bronze pins.

Alternate for Truck—(To be used on flagpoles with top diameters of 4 in. or over.) The truck is to be a "Lingo" extra heavy ball bearing revolving truck, with bronze body, revolving on manganese bronze spindle, with bottom ball race with thirty ¼-in. manganese bronze balls. Truck to be fitted with two 4-in. diameter bronze sheaves with bronze roller bushings and ½-in. monel metal pins.

Halyards—Provide two sets of ⅜-in. U. S. standard manila bolt rope halyards with bronze swivel snaps for securing to flag.

Cleats—Provide two 9-in. cast iron galvanized cleats tapped to flagpole with two $\frac{5}{16}$-in. galvanized flat head stove bolts.

Ground Protector—Provide a copper bearing steel ground protector, 18 in. long, extending 12 in. above and 6 in. below the grade and to be shrunk to the pole, calked on the upper edge and electric-welded on the lower edge to the flagpole.

DIMENSIONS, CONTINUOUS STRAIGHT TAPERED FLAGPOLES FOR GROUND SETTING

Exposed height, ft.	Foundation depth, ft.	Total length, ft.	Diameter, in.			Shipping weight, lb.	Wall thickness, in.
			Butt	Top	Ball		
Heavy							
20	3	23	5	3½	5	285	¼
25	3½	28½	6	3½	6	400	¼
30	3½	33½	6⅝	3½	6	605	$\frac{5}{16}$x¼
40	4	44	7⅝	3½	8	925	$\frac{5}{16}$x¼
50	5	55	8⅝	3½	8	1275	$\frac{5}{16}$x¼
60	6	66	10¾	3½	10	1750	⅜x¼
70	7	77	11¾	3½	10	2200	⅜x¼
75	7½	82½	12¾	4	12	2575	⅜x¼
80	8	88	14	4	12	2950	⅜x¼
90	9	99	15	4	14	3550	⅜x¼
100	10	110	16	4	14	4475	⅜x¼
Extra Heavy							
35	4	39	7⅝	3½	8	810	$\frac{5}{16}$x¼
40	4	44	8⅝	4	8	980	$\frac{5}{16}$x¼
45	4½	49½	9⅝	4½	8	1250	$\frac{5}{16}$x¼
50	5	55	10¾	5	10	1600	⅜x¼
60	6	66	11¾	5½	10	2150	⅜x¼
65	6½	71½	12¾	5½	12	2560	⅜x¼
70	7	77	14	5½	12	2900	⅜x¼
75	7½	82½	15	5½	14	3450	⅜x¼
80	8	88	16	5½	14	3875	⅜x¼
90	9	99	18	6½	14	5585	⅜x¼
100	10	110	20	6½	14	6285	⅜x¼

Specification "H"—Continuous Straight Tapered Flagpoles for Roof Setting, Anchored to Roof with Braces

Furnish and erect a continuous straight tapered steel flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, N. J. Flagpole to be roof set [Heavy] [Extra Heavy] type with .... feet exposed height above roof level with .... inches butt diameter tapering conically to a top diameter of .... inches. After erection apply over the shop coat of red metal primer two finishing coats of white lead and oil.

Flagpole Construction—(See paragraph under Specification "G.")

Ball—(See paragraph under Specification "G.")

Truck—(See paragraph under Specification "G.")

Alternate for Truck—(See paragraph under Specification "G.")

Halyards—(See paragraph under Specification "G.")

Cleats—(See paragraph under Specification "G.")

Flash Collar—Provide bronze flash collar, place on the flagpole at the height indicated and calk metal to metal after roof flashing has been installed by the roofing contractor.

Pole Socket and Plate—Provide cast iron pole socket and steel plate of proper size to suit flagpole and secure with a bolt and bearing plate, fastened to [concrete] [steel] [wood] construction as indicated on drawing No. B-5-A of JOHN E. LINGO & SON, INC.

Braces—Provide [tubular turnbuckle] [adjustable telescope] braces of proper number, length and sizes as detailed on drawing No. B-5-A of JOHN E. LINGO & SON, INC., and complete with brace collar and brace anchors. Braces to be made of copper bearing tubular steel. Brace collar to be calked to flagpole after erection at the proper height to rigidly support the flagpole. All the necessary drilling of [steel] [wood] beams (or placing of anchors in concrete) to be located in accordance with detail drawings to be submitted to the architect for approval by JOHN E. LINGO & SON, INC.

Specification "J"—Continuous Straight Tapered Flagpoles for Roof Setting, without Braces and Penetrating Roof to Loft Floor

Furnish and erect a continuous straight tapered steel flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, N. J. Flagpole to be roof set [Heavy] [Extra Heavy] type with .... feet exposed height above roof plus a distance of .... feet to loft floor; flagpole butt diameter .... inches tapering conically to a top diameter of .... inches. After erection apply over the shop coat of red metal primer two finishing coats of white lead and oil.

Flagpole Construction—(See paragraph under Specification "G.")

Ball—(See paragraph under Specification "G.")

Truck—(See paragraph under Specification "G.")

Cleats—(See paragraph under Specification "G.")

Halyards—(See paragraph under Specification "G.")

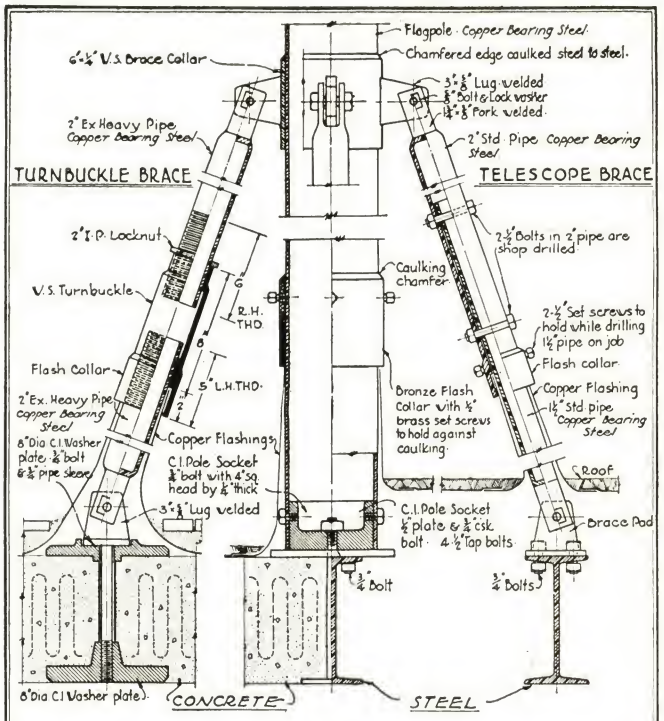
Flash Collar—(See paragraph under Specification "H.")

Roof Tube (if concrete slab) or **Guide Flange** (if steel or wood roof)—Provide [roof tube] [guide flange] of proper size to suit flagpole butt diameter; to be fastened to roof construction and calked metal to metal before roof flashing has been installed by the roofing contractor.

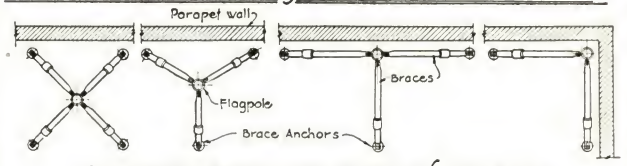
Pole Socket and Plate—(See paragraph under Specification "H.")

DIMENSIONS, CONTINUOUS STRAIGHT TAPERED FLAGPOLES FOR ROOF SETTING

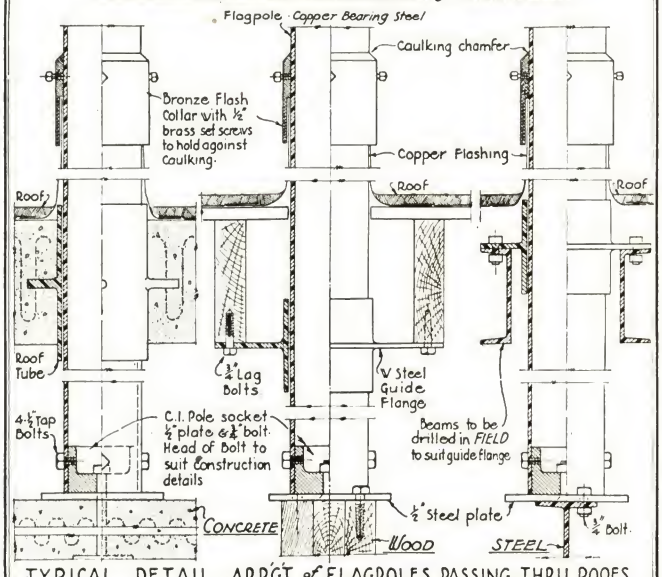
Exposed height, ft.	Diameter, in.		Shipping weight, lb.	Wall thickness, in.
	Butt	Top		
Heavy				
20	5	$3\frac{1}{2}$	240	$\frac{1}{4}$
25	6	$3\frac{1}{2}$	350	$\frac{1}{4}$
30	$6\frac{5}{8}$	$3\frac{1}{2}$	540	$\frac{5}{16}$X$\frac{1}{4}$
40	$7\frac{5}{8}$	$3\frac{1}{2}$	825	$\frac{5}{16}$X$\frac{1}{4}$
50	$8\frac{5}{8}$	$3\frac{1}{2}$	1130	$\frac{5}{16}$X$\frac{1}{4}$
60	$10\frac{3}{4}$	$3\frac{1}{2}$	1500	$\frac{3}{8}$X$\frac{1}{4}$
70	$11\frac{3}{4}$	$3\frac{1}{2}$	1880	$\frac{3}{8}$X$\frac{1}{4}$
75	$12\frac{3}{4}$	4	2200	$\frac{3}{8}$X$\frac{1}{4}$
80	14	4	2510	$\frac{3}{8}$X$\frac{1}{4}$
90	15	4	3025	$\frac{3}{8}$X$\frac{1}{4}$
100	16	4	3850	$\frac{3}{8}$X$\frac{1}{4}$
Extra Heavy				
35	$7\frac{5}{8}$	$3\frac{1}{2}$	705	$\frac{5}{16}$X$\frac{1}{4}$
40	$8\frac{5}{8}$	4	865	$\frac{5}{16}$X$\frac{1}{4}$
45	$9\frac{5}{8}$	$4\frac{1}{2}$	1090	$\frac{5}{16}$X$\frac{1}{4}$
50	$10\frac{3}{4}$	5	1390	$\frac{3}{8}$X$\frac{1}{4}$
60	$11\frac{3}{4}$	$5\frac{1}{2}$	1865	$\frac{3}{8}$X$\frac{1}{4}$
65	$12\frac{3}{4}$	$5\frac{1}{2}$	2235	$\frac{3}{8}$X$\frac{1}{4}$
70	14	$5\frac{1}{2}$	2515	$\frac{3}{8}$X$\frac{1}{4}$
75	15	$5\frac{1}{2}$	3000	$\frac{3}{8}$X$\frac{1}{4}$
80	16	$5\frac{1}{2}$	3370	$\frac{3}{8}$X$\frac{1}{4}$
90	18	$6\frac{1}{2}$	4950	$\frac{3}{8}$X$\frac{1}{4}$
100	20	$6\frac{1}{2}$	5500	$\frac{3}{8}$X$\frac{1}{4}$



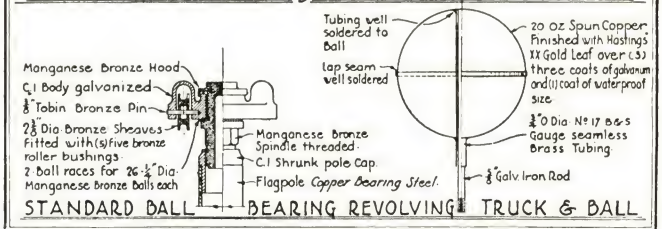
TYPICAL DETAIL ARR'GT of FLAGPOLES ABOVE ROOFS



PLAN VIEWS SHOWING TYPES of BRACING



TYPICAL DETAIL ARR'GT of FLAGPOLES PASSING THRU ROOFS



DRAWING No. B5-A.	JOHN E. LINGO & SON, INC. CAMDEN, NEW JERSEY.	SCALE 1"=1FOOT

CONTINUOUS ENTASIS TAPERED FLAGPOLES

Continuous Entasis Tapered Flagpoles are produced in copper bearing steel, bronze and aluminum with a smooth uninterrupted exterior surface throughout resembling a finished wood flagpole in contour and appearance. They are tapered with Venetian entasis or with entasis as selected by the architect. These flagpoles are especially suitable for memorials, monuments, plazas and buildings of exceptional architectural value where a prominent flagpole installation is desired to properly harmonize with the architectural design of the project.

Continuous Entasis Tapered Flagpoles are not carried in stock and are made to order only. They are, however, standardized in two weights for ground setting or roof setting, Standard and Sub-standard, as shown in the table of dimensions but may be proportioned to the architect's individual conception if so desired. Approximately one-third of the visible height is cylindrical, the diameter of which corresponds to a standard pipe size and the entasis tapered section is confined to the remaining visible height.

In the past it was impossible to obtain a wall thickness of more than ⅛-in. material at the top with a minimum diameter of 5 in. but now, by use of our patented processes, we are able to taper copper bearing steel, bronze or aluminum tubes to any desired taper or entasis and can produce Continuous Entasis Tapered Flagpoles with a wall thickness at the top up to ½ in. with no limit to a minimum top diameter. Wall thickness of the Standard and Sub-standard Continuous Entasis Tapered Flagpoles is from ¼ to ⅜ in. depending upon the top diameter of the flagpoles as shown in the table of dimensions.

Continuous Entasis Tapered Flagpoles, regardless of length, are shipped in one piece each, without field joints, but where handling or shipping will not permit, flagpoles are shipped in two sections each and assembled at erection site by means of a special field joint. This assembling, however, cannot be accomplished by inexperienced men and we will not ship Continuous Entasis Tapered Flagpoles in sections unless assembling in the field is accomplished by our own men. This tends to enhance the cost but insures the purchaser of a first class installation which might be ruined by the neglect and inexperience of others doing this work.

The dimensions, wall thicknesses, details, etc., shown in the table of dimensions apply to Continuous Entasis Tapered Flagpoles produced of copper bearing steel and bronze only but do not apply to the poles produced of aluminum.

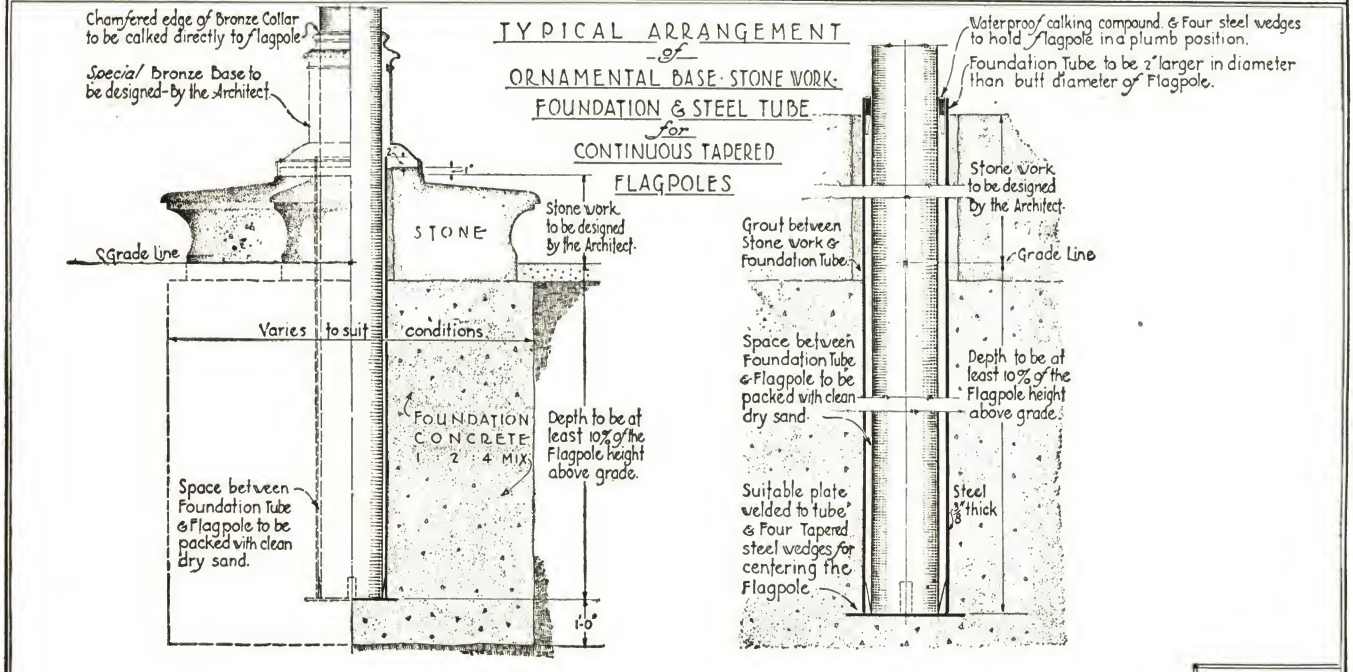
Further information regarding Continuous Entasis Tapered Aluminum Flagpoles will be furnished on application.

When Continuous Entasis Tapered Flagpoles for ground setting are used for monuments or memorials, the architect usually designs a special bronze base with special stone work. Drawing No. T-5, illustrated below, shows a typical arrangement of foundation, stone work, steel tube, ornamental base, etc., which makes an ideal setting. We gladly offer our services to architects, without obligation on their part, by assisting them in properly designing the necessary foundation so that no damage may result from vibration or water.

DIMENSIONS, CONTINUOUS ENTASIS TAPERED FLAGPOLES FOR GROUND SETTING OR ROOF SETTING

Visible height, ft.	Weight, lb.	Weight additional butt, lb.	Wall thickness, in.	Diameter, in.	
				Butt	Top
Standard					
20	240	14.6	¼	5	3
25	350	16.0	¼	6	3
30	540	18.9	5/16	6 5/8	3½
35	735	23.5	5/16	7 5/8	3½
40	920	28.5	5/16	8 5/8	4
45	1216	33.9	5/16	9 5/8	4
50	1785	40.4	3/8 x 5/16	10 3/4	4
60	2400	45.5	3/8	11 3/4	4½
65	2545	49.5	3/8	12 3/4	5
70	3390	54.5	3/8	14	5
75	4180	58.5	3/8	15	5
80	4315	62.5	3/8	16	5
90	5418	70.5	3/8	18	5
100	6670	78.5	3/8	20	5
Sub-standard					
20	180	9.1	¼	4	2
25	272	10.7	¼	4½	2½
30	363	12.5	¼	5	3
35	476	14.6	¼	5 9/16	3
40	724	18.9	5/16	6 5/8	3½
45	1002	23.5	5/16	7 5/8	3½
50	1285	28.5	5/16	8 5/8	3½
60	1847	33.9	3/8 x ¼	9 5/8	3½
65	2357	40.4	3/8 x 5/16	10 3/4	4
70	2727	45.5	3/8 x 5/16	11 3/4	4
75	3338	49.5	3/8 x 5/16	12 3/4	4
80	3994	54.5	3/8 x 5/16	14	4
90	4727	58.6	3/8 x 5/16	15	4
100	5800	62.6	3/8 x 5/16	16	4

JOHN E LINGO & SON, INC. FLAGPOLES in STEEL & BRONZE
CAMDEN, NEW JERSEY



Specification "D"—Continuous Entasis Tapered Flagpoles for Ground Setting

Furnish and erect a [Standard] [Sub-standard] continuous entasis tapered [copper bearing steel] [bronze] flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, New Jersey. Flagpole to be ground set .... feet exposed height above (grade) (top of ornamental base) with an over-all length of .... feet with a butt diameter of .... inches tapering with entasis to a top diameter of .... inches.

Flagpole Construction—The flagpole shall be constructed of [copper bearing steel] [bronze] of diameters, wall thicknesses and entasis as standardized by JOHN E. LINGO & SON., INC., for this type flagpole. The flagpole shall have a smooth uninterrupted exterior surface throughout, without visible joints or offsets, and shall be shipped from factory in one piece without field joints.

Ball—The ball shall be of size recommended by JOHN E. LINGO & SON, INC. for this type flagpole and shall be constructed of 20-oz. copper, covered with Hastings XX gold leaf over three coats of galvanum and one coat of waterproof size. Ball to be mounted on a ¾-in. seamless brass tube and slipped over a ⅝-in. diameter bronze rod attached to truck.

Truck—(To be used on flagpoles with top diameters up to 3½ in. only.) To be "Lingo" standard ball bearing revolving truck, with bronze body, revolving on manganese bronze spindle, with top and bottom ball races with twenty-six ¼-in. diameter bronze balls each. Truck to be fitted with two 2⅜-in. diameter bronze roller bushed sheaves and ⅜-in. diameter bronze pins.

Alternate for Truck—(To be used on flagpoles with top diameters of 4 in. or over.) To be "Lingo" extra heavy ball bearing revolving truck, with bronze body, revolving on manganese bronze spindle, with bottom ball race with thirty ¼-in. manganese bronze balls. Truck to be fitted with two 4-in. diameter bronze sheaves with bronze roller bushings and ½-in. monel metal pins.

Halyards—Provide two sets of Silver Lake A No. 10 cotton braided halyards with bronze swivel snaps at each end for securing to flag.

Cleats—Provide two 9-in. bronze cleats tapped to flagpole with two ⅝-in. bronze machine screws.

Painting—(To be included only if flagpole is constructed of copper bearing steel.) After erection of flagpole, apply over shop coat of red metal primer, two finishing coats of white lead and oil.

Note: For typical arrangement of foundation, stone work, ornamental base, etc. for Continuous Tapered Flagpoles for ground setting, see drawing No. T-5 on preceding page.

Specification "E"—Continuous Entasis Tapered Flagpoles for Roof Setting, Anchored to Roof with Braces

Furnish and erect a [Standard] [Sub-standard] continuous entasis tapered [copper bearing steel] [bronze] flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, New Jersey. Flagpole to be roof set with .... feet exposed height above roof level with .... inches butt diameter tapering with entasis to a top diameter of .... inches.

72-ft. Over All, Continuous Entasis Tapered Copper Bearing Steel Flagpole

One of two installations at Civic Centre, Pasadena, Calif. 12¾-in. butt, 5-in. top.

Flagpole Construction—(See paragraph under Specification "D.")

Ball—(See paragraph under Specification "D.")

Truck—(See paragraph under Specification "D.")

Alternate for Truck—(See paragraph under Specification "D.")

Halyards—(See paragraph under Specification "D.")

Cleats—(See paragraph under Specification "D.")

Flash Collar—Provide bronze flash collar, place on the flagpole at the height indicated and calk metal to metal after roof flashing has been installed by the roofing contractor.

Pole Socket and Plate—Provide cast iron pole socket and steel plate of proper size to suit flagpole and secure with a bolt and bearing plate, fastened to [concrete] [wood] [steel] construction as indicated on drawing No. B-5-A of JOHN E. LINGO & SON, INC.

Braces—Provide [tubular turnbuckle] [adjustable telescope] braces of proper number, length and sizes as detailed on drawing No. B-5-A of JOHN E. LINGO & SON, INC., and complete with brace collar and brace anchors. Braces to be made of copper bearing tubular steel. Brace collar to be calked to flagpole after erection at the proper height to rigidly support the flagpole. All the necessary drilling of [steel] [wood] beams (or placing of anchors in concrete) to be located in accordance with detail drawings to be submitted to the architect for approval by JOHN E. LINGO & SON, INC.

Painting—(To be included only if the flagpole is constructed of copper bearing steel.) After erection of flagpole, apply over shop coat of red metal primer two finishing coats of white lead and oil.

Specification "F"—Continuous Entasis Tapered Flagpoles for Roof Setting, without Braces and Penetrating Roof to Loft Floor

Furnish and erect a [Standard] [Sub-standard] continuous entasis tapered [copper bearing steel] [bronze] flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, New Jersey. Flagpole to be roof set with .... feet above roof level plus a distance of .... feet to loft floor; flagpole butt diameter to be .... inches tapering with entasis to a top diameter of .... inches.

Flagpole Construction—(See paragraph under Specification "D.")

Ball—(See paragraph under Specification "D.")

Truck—(See paragraph under Specification "D.")

Alternate for Truck—(See paragraph under Specification "D.")

Cleats—(See paragraph under Specification "D.")

Halyards—(See paragraph under Specification "D.")

Flash Collar—(See paragraph under Specification "E.")

Roof Tube (if concrete slab) or **Guide Flange** (if steel or wood roof)—To be provided of proper size to suit flagpole butt diameter; to be fastened to roof construction and calked metal to metal before roof flashing has been installed by the roofing contractor.

Pole Socket and Plate—(See paragraph under Specification "E.")

Painting—(See paragraph under Specification "E.")

CONTINUOUS ENTASIS TAPERED OUTRIGGER FLAGPOLES

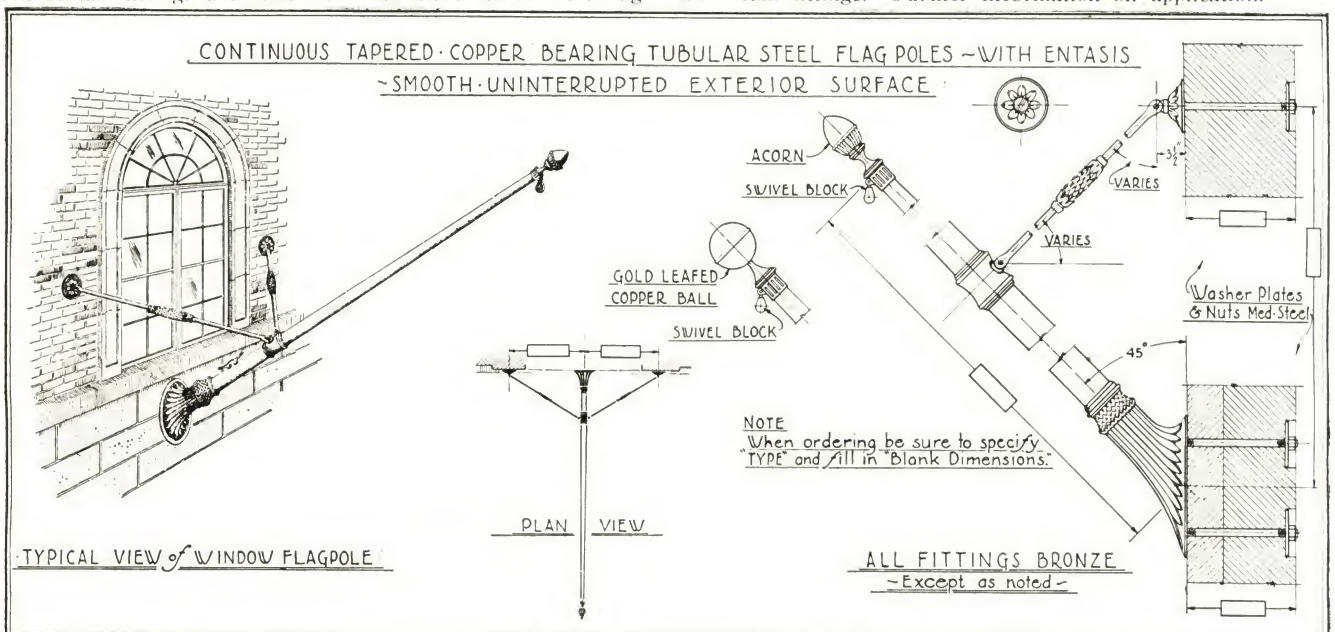
Continuous entasis tapered outrigger or window flagpoles are produced in either *bronze* or copper bearing steel in lengths varying from 16 to 30 ft. and may be projected from the face of the building at a fixed angle of 45 degrees from the vertical (see drawing No. B-12) or projected at any angle desired by use of a hinged arrangement (see drawing No. B-14).

Continuous entasis tapered outrigger or window flagpoles are suitable for bank buildings, office buildings, etc., where it is desirable to fly the flag at lower levels than on a flagpole located on the roof. The poles have a smooth uninterrupted exterior surface throughout without visible joints or offsets and are tapered with Venetian entasis. The minimum top diameter is 1½ in. with a wall thickness of approximately $\frac{3}{16}$ in. increasing downward to the butt.

Extended from Face of Building at Fixed Angle of 45 Degrees

For beauty and dignity, we recommend the outrigger or window flagpole arrangement shown on drawing No. B-12 below. Continuous entasis tapered flagpoles of this arrangement are produced in either *bronze* or copper bearing steel and complete specifications covering this arrangement are shown below. All bronze fittings are furnished with either the bronze flagpoles or the copper bearing steel flagpoles and the bronze base is so arranged to project the flagpole from the face of the building only at an angle of 45 degrees from the vertical.

Flagpoles of this type are also produced of aluminum with aluminum fittings. Further information on application.



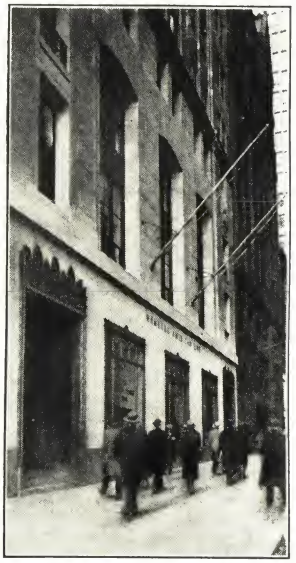
TYPE	LIGHT						HEAVY						EXTRA·HEAVY						DRAWING NUMBER
LENGTH in FEET	16	18	20	22	25	30	16	18	20	22	25	30	16	18	20	22	25	30	B-12
DIAMETER at TOP	1½"	1½"	1½"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2½"	
DIAMETER at BUTT	2⅞"	2⅞"	2⅞"	3½"	4"	4½"	3½"	3½"	3½"	4"	4½"	5"	4"	4"	4"	4½"	5"	5⅝"	

One of Two 28-ft. Continuous Entasis Tapered Outrigger Flagpoles
7⅝-in. butt, 4-in. top
Fidelity-Philadelphia Building, Philadelphia, Pa.

Specifications for Continuous Entasis Tapered Outrigger Flagpoles Extended from Face of Building at Fixed Angle of 45 Degrees

Furnish and install a continuous entais tapered [bronze] [copper bearing steel] outrigger flagpole on the face of the building, where shown on plans, projected at an angle of 45 degrees from the vertical, all to be in strict accordance with drawing No. B-12 of JOHN E. LINGO & SON, INC., Camden, N. J. Flagpole to be [Light] [Heavy] [Extra Heavy] type, ... feet long, with .... inches, butt diameter tapering with entasis to .... inches top diameter.

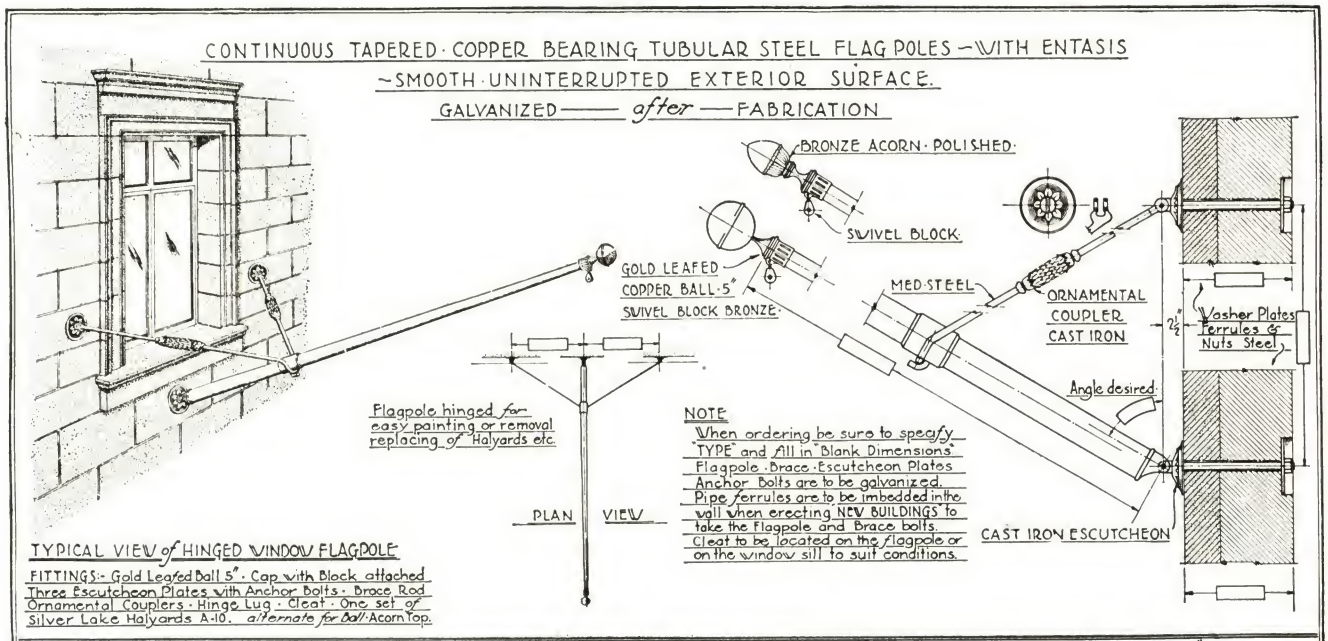
Flagpole shall be of continuous entasis tapered construction, having a smooth uninterrupted exterior surface throughout without visible joints or offsets and shall be shipped from factory in one piece without field joints. All fittings shall be bronze, except the halyards, and shall consist of one bronze acorn top, one bronze pole cap with bronze swivel block, one 9-in. bronze cleat, one set of Silver Lake A No. 10 cotton braided halyards with bronze swivel snaps, one standard bronze base with bronze anchor bolts, washer plates and nuts, one set of bronze braces with bronze ornamental couplers, bronze brace collar, bronze rosettes, etc., all in accordance with drawing No. B-12 of JOHN E. LINGO & SON, INC.



Two 20-ft. Extra Heavy Bronze Continuous Entasis Tapered Outrigger Flagpoles
Per drawing No. B-12
4-in. butt, 2-in. top
Harriman Building, New York, N. Y.

Continuous Entasis Tapered Outrigger Flagpoles with Hinged Arrangement to Permit Extension from Face of Building at Any Angle Desired

For economical maintenance and easy accessibility, we recommend the outrigger or window flagpole arrangement shown on drawing No. B-14 below. Continuous entasis tapered flagpoles of this arrangement are produced in either *bronze* or copper bearing steel and complete specifications covering this arrangement are shown below. All-bronze fittings are furnished with the bronze flagpoles, whereas bronze, galvanized cast iron and steel fittings in combination are used with the copper bearing steel flagpoles. Flagpoles of this arrangement may be projected from the face of the building at any angle selected by the architect. The hinged arrangement permits righting the flagpoles for repainting or repairs at a minimum cost, eliminates the risky operation with a boatswain's chair from the roof and saves the expense of scaffolding and dismantling.



TYPE	LIGHT						HEAVY						EXTRA-HEAVY						DRAWING NUMBER B-14
LENGTH in FEET	16	18	20	22	25	30	16	18	20	22	25	30	16	18	20	22	25	30	
DIAMETER at TOP	1½"	1½"	1½"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2½"	
DIAMETER at BUTT	2⅞"	2⅞"	2⅞"	3½"	4"	4½"	3½"	3½"	3½"	4"	4½"	5"	4"	4"	4"	4½"	5"	5⅝"	

Specifications for Continuous Entasis Tapered Outrigger Flagpoles with Hinged Arrangement to Permit Extension from Face of Building at Any Angle Desired

Furnish and install a continuous entasis tapered [bronze] [copper bearing steel] outrigger flagpole on the face of the building, where shown on plans, projected at an angle of ... degrees from the vertical, all to be in strict accordance with drawing No. B-14 of JOHN E. LINGO & SON, INC., Camden, N. J. Flagpole to be [Light] [Heavy] [Extra Heavy] type, ... feet long, with .... inches butt diameter tapering with entasis to .... inches top diameter.

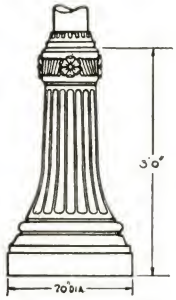
(If flagpole is bronze include the following): Flagpole shall be of continuous entasis tapered construction, having a smooth uninterrupted exterior surface throughout without visible joints or offsets and shall be shipped from factory in one piece without field joints. The fittings shall consist of one bronze acorn top (Alternate—one 5-in. gold leafed copper ball), one bronze pole cap with bronze swivel block, one 9-in. bronze cleat, one set of Silver Lake A No. 10 cotton braided halyards with bronze swivel snaps, one set of bronze rod braces with bronze ornamental couplers and bronze rosettes, one bronze hinge lug with bronze escutcheon plate, bronze anchor bolts, washer plates, etc., all in accordance with drawing No. B-14 of JOHN E. LINGO & SON, INC.

(If flagpole is copper bearing steel include the following): Flagpole shall be of continuous entasis tapered construction, galvanized after fabrication, having a smooth uninterrupted exterior surface throughout without visible joints or offsets and shall be shipped from factory in one piece without field joints. The fittings shall consist of one bronze acorn top (Alternate—one 5-in. gold leafed copper ball), one bronze pole cap with bronze swivel block, one 9-in. galvanized cleat, one set of Silver Lake A No. 10 cotton braided halyards with bronze swivel snaps, one set of galvanized steel rod braces with galvanized cast iron ornamental couplers and galvanized cast iron rosettes, one galvanized cast iron hinge lug with galvanized cast iron escutcheon plate, galvanized steel anchor bolts, washer plates, etc., all in accordance with drawing No. B-14 of JOHN E. LINGO & SON, INC.

16 Ft. Over All, Continuous Entasis Tapered Heavy Type Copper Bearing Steel Outrigger Flagpole
Per drawing No. B-14
New Jersey Bell Telephone Building, Mount Holly, N. J.

Two 16-ft. Extra Heavy Continuous Entasis Tapered Outrigger Flagpoles
4-in. butt, 2-in. top
Collingswood Trust Co., Collingswood, N. J.

Design No. 2106
4 to 5 in.



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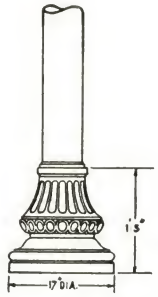

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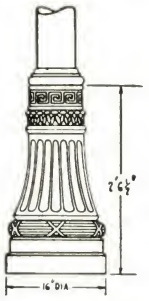

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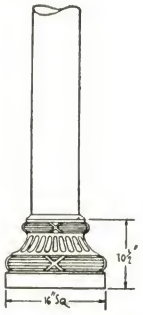
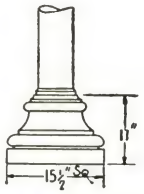


Design No. 2108
5 9/16 to 7⅝ in.



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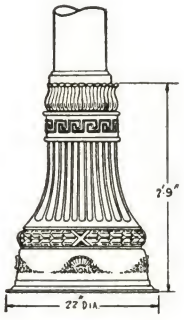
5 to 5 9/16 in.



Design No. 2101
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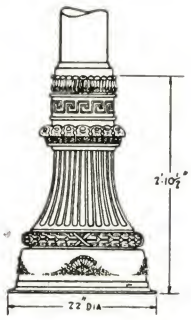

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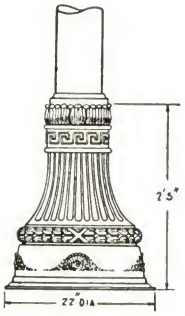

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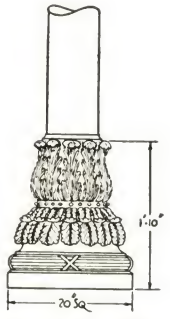

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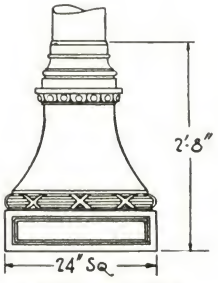
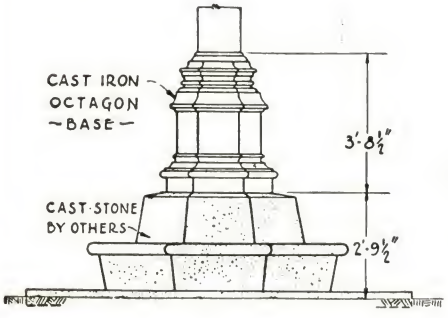


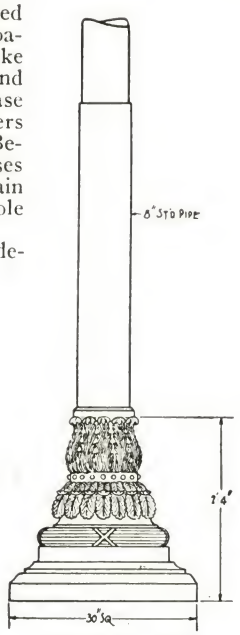
Design No. 1902
7⅝ to 9⅝ in.

We carry in stock this complete line of ornamental cast iron flagpole bases, painted or galvanized. A ring collar is cast separate and furnished with the base to make a proper "joint" between the flagpole and the collar for hot lead calking. Each base fits certain flagpoles only the butt diameters of which are shown under each base. Before finally specifying one of these bases for a certain flagpole be sure to ascertain whether the butt diameter of the flagpole will fit the base selected.

See following page for additional designs of stock cast iron bases.



Design No. 1990
12¾ to 18 in.



Design No. 2110
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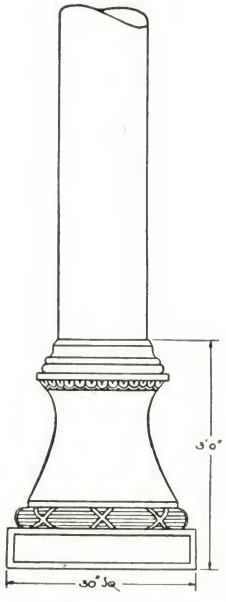
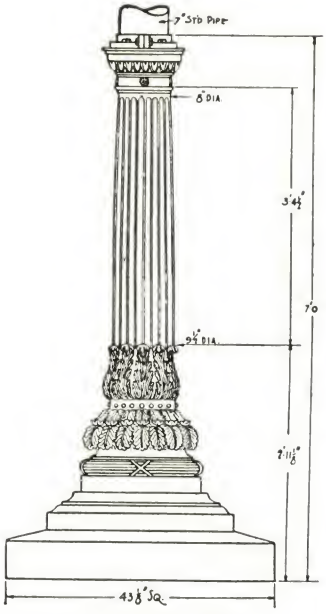
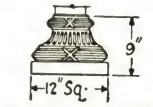


Design No. 1999
10¾ to 16 in.

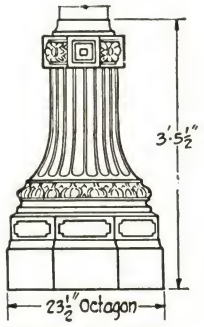


Design No. 2121
7⅝ in.

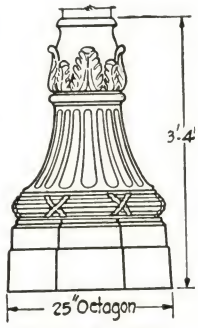
NO SCALE	JOHN E. LINGO & SON, INC. FLAGPOLES IN COPPER BEARING STEEL, BRONZE AND ALUMINUM CAMDEN, N. J.	DRAWING NO. B-6



Design No. 2118
3½ to 4½ in.



Design No. 2130
5 9/16 to 7⅝ in.



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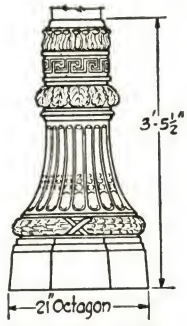

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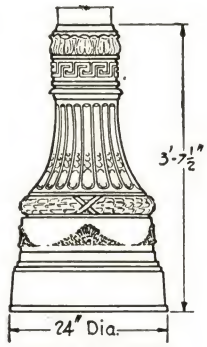

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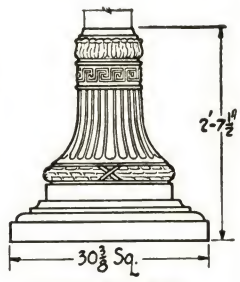

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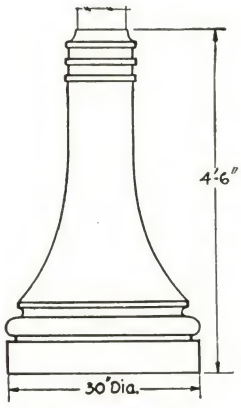

Design No. 25
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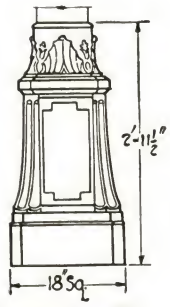

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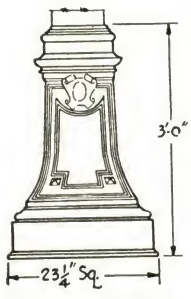

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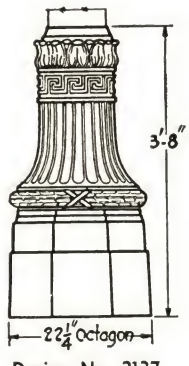

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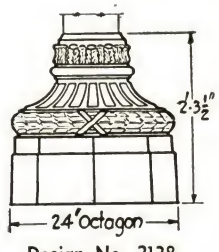
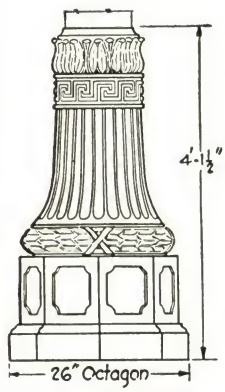
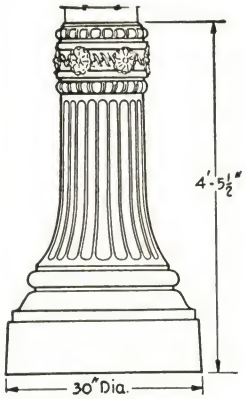


Design No. 2138
6⅝ to 8⅝ in.

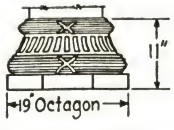
In addition to the bases shown on the preceding page we carry in stock this complete line of ornamental cast iron flagpole bases, painted or galvanized. A ring collar is cast separate and furnished with the base to make a proper "joint" between the flagpole and the collar for hot lead calking. Each base fits certain flagpoles only the butt diameters of which are shown under each base. Before finally specifying one of these bases for a certain flagpole be sure to ascertain whether the butt diameter of the flagpole will fit the base selected.



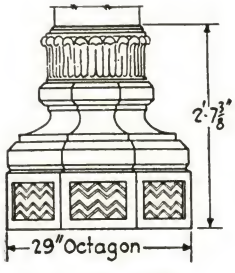
Design No. 2139
8⅝ to 10¾ in.



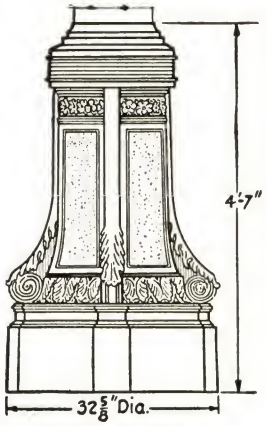
Design No. 2140
8⅝ to 10¾ in.



Design No. 2128
9⅝ to 11¾ in.



Design No. 2129
10¾ to 12¾ in.

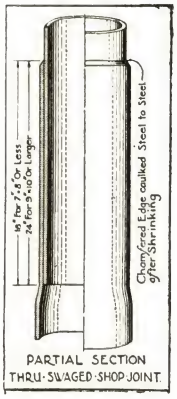


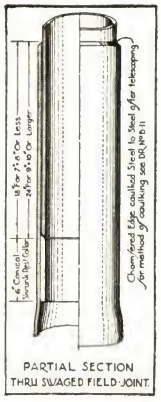
Design No. 2141
10¾ to 12¾ in.

NO SCALE	JOHN E. LINGO & SON, INC. FLAGPOLES IN COPPER BEARING STEEL, BRONZE AND ALUMINUM CAMDEN, N. J.	DRAWING NO. B-66

SWAGED SECTIONAL FLAGPOLES

These poles are fabricated by joining consecutive diminishing diameters of new mill run of full weight standard, open hearth (lap-welded), copper bearing steel tested pipe with joints either of the *shop* type (swaged, telescoped and shrunk) or of the *field* type (swaged and self-aligning), constructed without bolts, pins, rivets, screw couplings or lead calking and designed to withstand wind stresses up to 90 miles per hour with a conservative bending resistance. They are shipped in one or more knocked down sections and assembled on the ground by means of the field joints. Each section is made to suit car lengths which allows transportation at a minimum rate (for less than carload lots) and each section may contain two or more pieces to produce the proper reduction. At the erection site the flagpole erector merely pushes or telescopes the sections together and after erection makes the field joints airtight and watertight by calking metal to metal with only an ordinary hammer and calking chisel. Inexperienced men may, in a minimum length of time, accomplish the erection of these flagpoles.





SWAGED SECTIONAL FLAGPOLES FOR GROUND SETTING

Exposed height, ft.	Foundation depth, ft.	Total length, ft.	Diameter, in. Butt	Top	Ball	Ship. wgt., lb.	Sections Number	Number k. d.
Light Pattern								
17	3	20	3 1/2	2 3/8	5	145	3	1
25	3 1/2	28 1/2	4	2 3/8	5	242	4	2
33	4	37	4 1/2	2 3/8	6	360	5	2
41	4 1/2	45 1/2	5	2 3/8	6	502	6	3
49 1/2	4 1/2	54	5 9/16	2 3/8	6	653	7	3
57 1/2	5	62 1/2	6 5/8	2 3/8	8	850	8	4
65 1/2	6	71 1/2	7 5/8	2 3/8	8	1100	9	4
73	6	79	7 5/8	2 3/8	8	1310	9	5
80	7	87	8 5/8	2 3/8	8	1625	10	5
90	8	98	9 5/8	2 3/8	10	2100	11	6
100	8	108	10 3/4	2 3/8	10	2600	12	6
Heavy Pattern								
20	3	23	4	2 7/8	5	218	3	1
25	3 1/2	28 1/2	4 1/2	2 7/8	5	314	4	2
30	3 1/2	33 1/2	5	2 7/8	6	405	5	2
40	4	44	5 9/16	2 7/8	6	593	6	3
50	5	55	6 5/8	2 7/8	8	800	7	3
60	6	66	7 5/8	2 7/8	8	1200	8	4
70	7	77	8 5/8	2 7/8	8	1600	9	4
75	7 1/2	82 1/2	9 5/8	2 7/8	10	1960	10	5
80	8	88	10 3/4	2 7/8	10	2410	11	5
90	9	99	11 3/4	2 7/8	10	2840	12	6
100	10	110	12 3/4	2 7/8	12	3600	13	6
125	12	137	14	2 7/8	14	5414	14	7
Extra Heavy Pattern								
25	3 1/2	28 1/2	5	2 7/8	6	380	5	2
30	3 1/2	33 1/2	5 9/16	2 7/8	6	498	6	2
35	4	39	6 5/8	3 1/2	8	716	6	2
40	5	45	7 5/8	3 1/2	8	960	7	3
47	6	53	8 5/8	3 1/2	8	1212	8	3
55	6	61	9 5/8	3 1/2	8	1661	9	4
62	7	69	10 3/4	3 1/2	10	1950	10	4
70	7	77	11 3/4	4	10	2612	10	5
77	8	85	12 3/4	4	12	3183	11	5
85	8	93	14	4	12	4260	12	6
90	10	100	15	4	14	4932	13	6
100	10	110	16	4	14	5870	14	7

Specification "A"—Swaged Sectional Flagpoles for Ground Setting

Furnish and erect a swaged sectional copper bearing tubular steel flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, N. J., and build concrete foundation in accordance with their standard details. Flagpole to be ground set [Light] [Heavy] [Extra Heavy] pattern with ..... feet exposed height above ground by ..... feet total length with ..... inches butt diameter. After erection, apply over the shop coat of red metal primer two finishing coats of white lead and oil.

Flagpole Construction—Flagpole to be fabricated in sections of standard full weight copper bearing tubular steel pipe of diameters, thicknesses, lengths and joints as detailed by JOHN E. LINGO & SON, INC., for this type pole. Shop joints to be swaged, shrunk and calked steel to steel. Field joints to be calked steel to steel, airtight and watertight to prevent interior corrosion and deterioration. All joints to be constructed without the use of bolts, pins, rivets, screw couplings or lead calking.

Ball—(See paragraph under Specification "G.")
Truck—(See paragraph under Specification "G.")
Alternate for Truck—(For extra heavy pattern poles with 4-in. top diameter.) (See paragraph under Specification "G.")
Cleats—(See paragraph under Specification "G").
Ground Protector—(See paragraph under Specification "G").

SWAGED SECTIONAL FLAGPOLES FOR ROOF SETTING

Exposed height, ft.	Diameter, in. Butt	Top	Ball*	Shipping weight, lb.	Sections Number	Number k. d.
Heavy Type						
20	4	2 7/8		159	3	1
25	4 1/2	2 7/8		245	4	2
30	5	2 7/8		325	5	2
40	5 9/16	2 7/8		500	6	3
50	6 5/8	2 7/8		680	7	3
60	7 5/8	2 7/8		990	8	4
70	8 5/8	2 7/8		1375	9	4
75	9 5/8	2 7/8		1620	9	5
80	10 3/4	2 7/8		1750	10	5
90	11 3/4	2 7/8		2500	11	6
100	12 3/4	2 7/8		3000	12	6
Extra Heavy Type						
20	5	2 7/8		244	5	1
25	5 9/16	2 7/8		341	6	2
30	6 5/8	3 1/2		500	6	2
35	7 5/8	3 1/2		668	7	2
43	8 5/8	3 1/2		953	8	3
51	9 5/8	3 1/2		1392	9	4
59	10 3/4	3 1/2		1796	10	4
67	11 3/4	4		2465	10	5
75	12 3/4	4		2970	11	5

*To suit height of building.

Specification "B"—Swaged Sectional Flagpoles for Roof Setting, Anchored to Roof with Braces

Furnish and erect a swaged sectional copper bearing tubular steel flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, N. J. Flagpole to be roof set [Heavy] [Extra Heavy] type with ..... feet exposed height above roof level with ..... inches butt diameter. After erection apply over the shop coat of red metal primer two finishing coats of white lead and oil.

Flagpole Construction—(See paragraph under Specification "A.")
Ball—(See paragraph under Specification "G.")
Truck—(See paragraph under Specification "G.")
Alternate for Truck—(For extra heavy type poles with 4-in. top diameter.) (See paragraph under Specification "G.")
Halyards—(See paragraph under Specification "G.")
Cleats—(See paragraph under Specification "G.")
Flash Collar—Provide bronze flash collar, place on the flagpole at the height indicated and calk metal to metal after roof flashing has been installed by the Roofing Contractor.
Pole Socket and Plate—Provide cast iron pole socket and steel plate of proper size to suit flagpole and secure with a bolt and bearing plate, fastened to concrete [wood] [steel] construction as indicated on drawing No. B5A of JOHN E. LINGO & SON, INC.
Braces—Provide suitable number of [turnbuckle] [telescope] braces to be of sufficient length and of sizes as detailed on drawing No. B5A of JOHN E. LINGO & SON, INC., and complete with brace collar and suitable brace anchors. Braces to be made of copper bearing tubular steel. Brace collar to be calked to flagpole after erection at the proper height to rigidly support the pole. All the necessary drilling of [steel] [wood] beams (or placing of anchors in concrete) to be located in accordance with detail drawings to be submitted to the architect for approval by JOHN E. LINGO & SON, INC.

Specification "C"—Swaged Sectional Flagpoles for Roof Setting, without Braces and Penetrating Roof to Loft Floor

Furnish and erect a swaged sectional copper bearing tubular steel flagpole complete with all standard fittings as listed below, made by JOHN E. LINGO & SON, INC., Camden, N. J. Flagpole to be roof set [Heavy] [Extra Heavy] type with ..... feet above roof plus a distance of ..... feet to loft floor; flagpole butt diameter to be ..... inches. After erection apply over the shop coat of red metal primer two finishing coats of white lead and oil.

Flagpole Construction—(See paragraph under Specification "A.")
Ball—(See paragraph under Specification "G.")
Truck—(See paragraph under Specification "G.")
Alternate for Truck—(For extra heavy type poles with 4-in. top diameter.) (See paragraph under Specification "G.")
Halyards—(See paragraph under Specification "G.")
Cleats—(See paragraph under Specification "G.")
Roof Tube (if concrete slab) or Guide Flange (if steel or wood roof)—To be provided of proper size to suit flagpole butt diameter; to be fastened to roof construction and calked steel to steel before roof flashing has been installed by the roofing contractor.
Flash Collar—(See paragraph under Specification "B.")
Pole Socket and Plate—Provide cast iron pole socket and steel plate of proper size to suit flagpole and secure with a bolt and bearing plate, fastened to [concrete] [steel] [wood] construction as indicated on drawing No. B5A of JOHN E. LINGO & SON, INC. Detail drawings are to be submitted to the architect for approval by JOHN E. LINGO & SON, INC.

EQUIPOISE TILTING FLAGPOLES

Purpose and Advantages

Equipoise Tilting Flagpoles are intended only for roof installations and then only in localities where experienced flagpole painters or steeplejacks are not available for repainting or installing halyards in a fixed roof pole. No tilting pole has the same pleasing appearance as a fixed ground set pole, and therefore we recommend that Equipoise poles be installed only on the roof where the tilting unit may be placed behind the parapet wall unseen from the street level. Due to the extreme unsightliness of any roof pole canted at an angle over the parapet wall we recommend that the Equipoise poles be erected always in a vertical position. Equipose Tilting Flagpoles are lighter in total weight and require less roof reinforcements than the usual counterbalanced pole. There are no worm gears or windlass arrangements which cause tremendous leverage on the roof while the pole is being raised or lowered. By use of the counterweights on the Equipose poles the roof load remains unchanged at all times regardless of the position of the pole. By merely withdrawing the king pin and slightly pushing the counterweights the pole is brought to a horizontal position with utmost ease, being perfectly balanced at any position. Shop tests have shown where an assembled unit is merely set on a flat surface, *without anchoring*, that the pole may be safely raised or lowered.

Pole Construction, Sizes and Trimmings

Equipoise Tilting Flagpoles are furnished with either our swaged sectional or continuous entasis tapered constructions, both of which, although recognized by architects as superior, have never before been available in tilting flagpoles. These poles are furnished only in copper bearing steel and are standardized in four lengths as listed in the table of dimensions. The 20-ft. poles are suitable for buildings up to 3 stories high, the 25-ft. poles for buildings up to 8 stories high, the 32½-ft. poles for buildings up to 12 stories high and the 40-ft. poles for buildings over 12 stories high. Each pole is furnished with a gold leafed copper ball, standard ball bearing revolving truck, one cast iron galvanized cleat, one set of manila halyards and two bronze swivel flag snaps. One shop coat of red metal primer is applied to the pole and tilting unit before shipment. The table of dimensions applies particularly to swaged sectional Equipoise poles although the same dimensions may be used for continuous entasis tapered Equipoise poles. Continuous entasis tapered Equipoise poles, however, are shipped in one piece without field joints whereas the swaged sectional Equipoise poles are shipped knockdown.

Tilting Unit Construction

The wrought steel supporting standards are of web plate construction rigidly secured to the wrought steel base plate. The socket is made of semicast steel with steel trunnions cast in. The bearings are made of semicast steel and are bronze bushed. The counterweights are made of gray iron and the king pin is wrought steel.

Adaptability

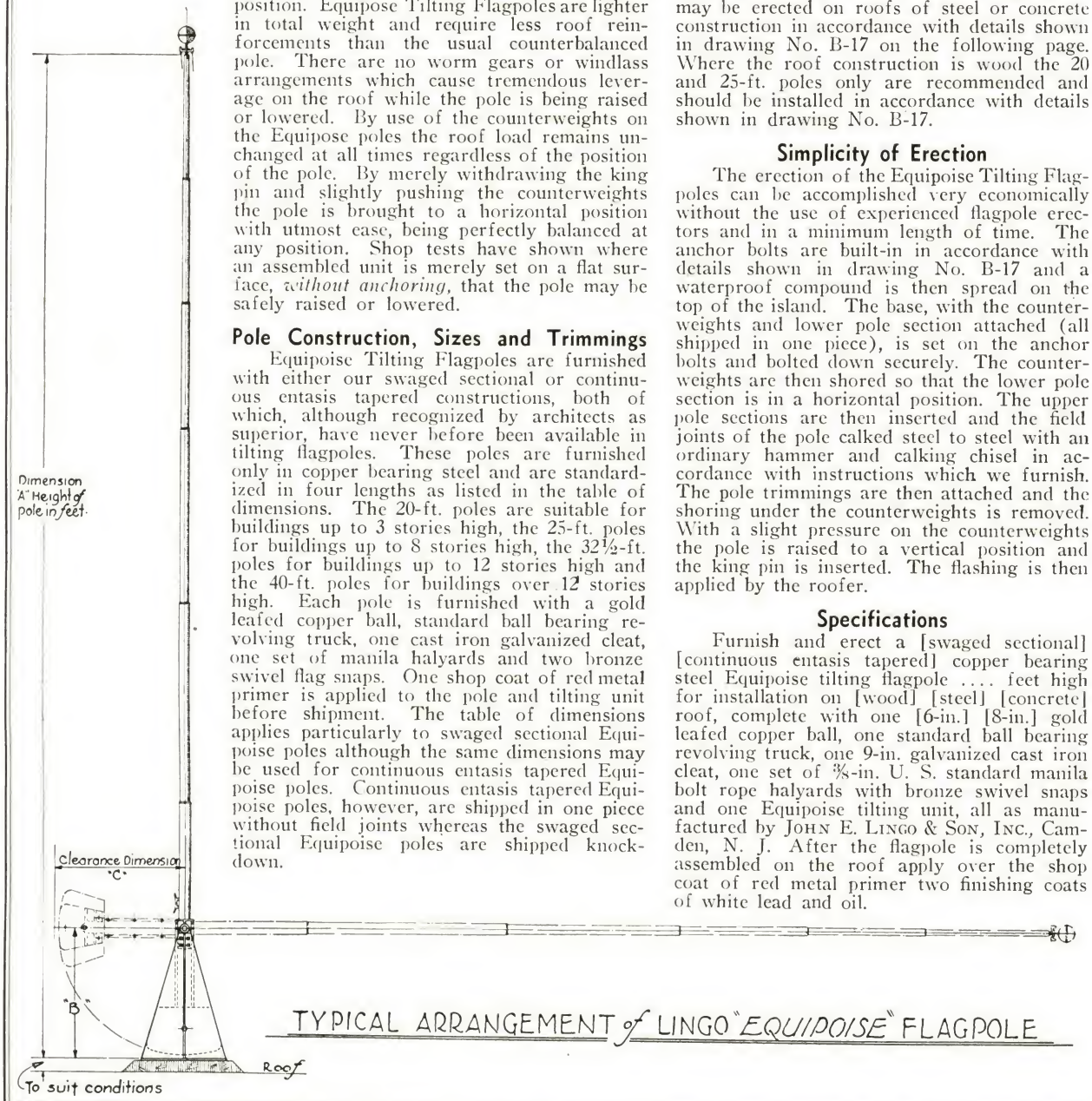
Any one of the four standard length poles may be erected on roofs of steel or concrete construction in accordance with details shown in drawing No. B-17 on the following page. Where the roof construction is wood the 20 and 25-ft. poles only are recommended and should be installed in accordance with details shown in drawing No. B-17.

Simplicity of Erection

The erection of the Equipoise Tilting Flagpoles can be accomplished very economically without the use of experienced flagpole erectors and in a minimum length of time. The anchor bolts are built-in in accordance with details shown in drawing No. B-17 and a waterproof compound is then spread on the top of the island. The base, with the counterweights and lower pole section attached (all shipped in one piece), is set on the anchor bolts and bolted down securely. The counterweights are then shored so that the lower pole section is in a horizontal position. The upper pole sections are then inserted and the field joints of the pole calked steel to steel with an ordinary hammer and calking chisel in accordance with instructions which we furnish. The pole trimmings are then attached and the shoring under the counterweights is removed. With a slight pressure on the counterweights the pole is raised to a vertical position and the king pin is inserted. The flashing is then applied by the roofer.

Specifications

Furnish and erect a [swaged sectional] [continuous entasis tapered] copper bearing steel Equipoise tilting flagpole .... feet high for installation on [wood] [steel] [concrete] roof, complete with one [6-in.] [8-in.] gold leafed copper ball, one standard ball bearing revolving truck, one 9-in. galvanized cast iron cleat, one set of ⅜-in. U. S. standard manila bolt rope halyards with bronze swivel snaps and one Equipoise tilting unit, all as manufactured by JOHN E. LINGO & SON, INC., Camden, N. J. After the flagpole is completely assembled on the roof apply over the shop coat of red metal primer two finishing coats of white lead and oil.

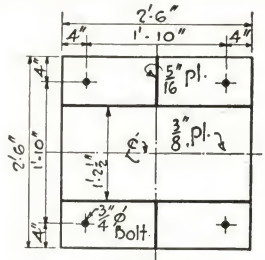


TYPICAL ARRANGEMENT of LINGO "EQUIPOISE" FLAGPOLE

TABLE of DIMENSIONS

DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	O. DIA of TOP	O. DIA of BUTT	DIA of BALL	TOTAL WEIGHT POLE & BASE	POLE SECTIONS NUMBER	POLE SECTIONS NUMBER KD	NOTE
20'0"	3'-6"	4'-0"	2⅞"	4"	6"	950	3	2	For Typical Roof Settings
25'0"	3'-6"	4'-0"	2⅞"	4½"	6"	1365	4	2	see Drawing No B-17 on the
32'-6"	5'-0"	5'-6"	2⅞"	5"	8"	1850	5	3	following page.
40'-0"	5'-0"	5'-6"	2⅞"	5 9/16"	8"	3000	6	3	

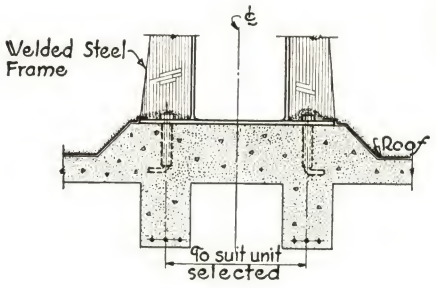
DRAWING NO-B-16	JOHN E. LINGO & SON, INC. FLAGPOLES IN STEEL & BRONZE CAMDEN, NEW JERSEY	NO SCALE



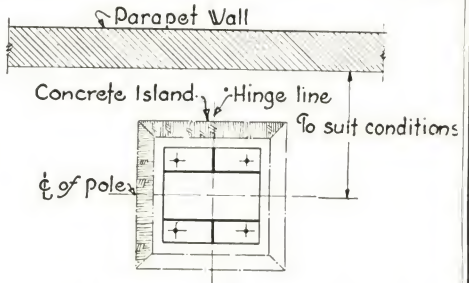
BASE

20' & 25' FLAGPOLES

Total Deadweight of 20' unit 950 LBS.
Live Load per sq. foot 160 LBS.
Total Deadweight of 25' unit 1365 LBS.
Live Load per sq. foot 225 LBS.

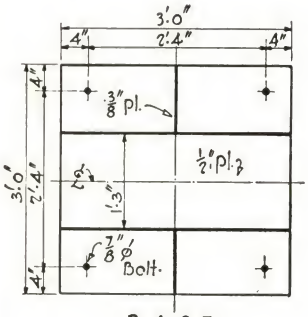


CONCRETE CONSTRUCTION



TYPICAL PLAN on ROOF

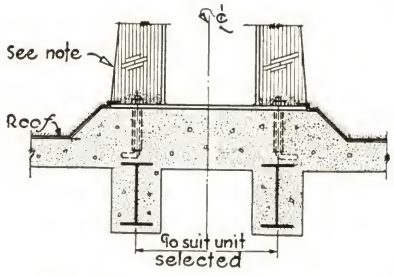
Base may be set so that flagpole hinges either parallel or perpendicular to wall.



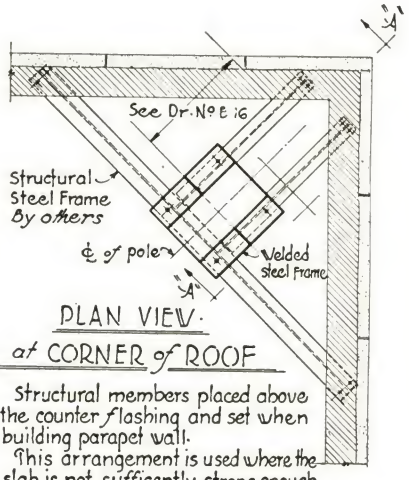
BASE

32'-6" FLAGPOLE

Total Deadweight of unit 1850 LBS.
Live Load per sq. foot 210 LBS.



STEEL CONSTRUCTION

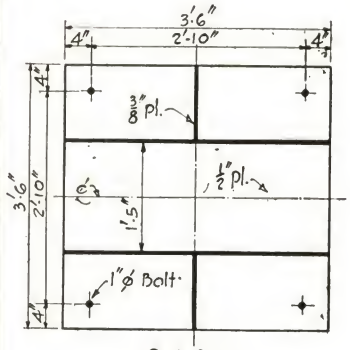


PLAN VIEW at CORNER of ROOF

Structural members placed above the counter flashing and set when building parapet wall.

This arrangement is used where the slab is not sufficently strong enough to support the unit selected.

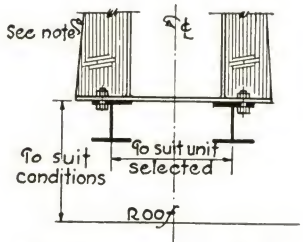
This arrangement permits clearing of drainage inlets or cants in roof construction.



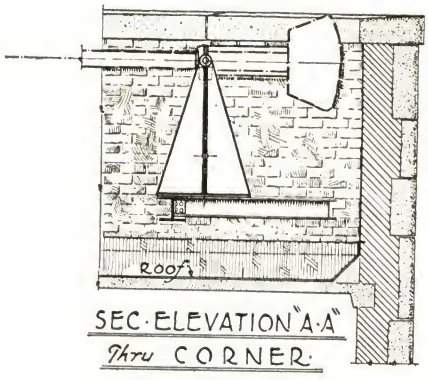
BASE

40' FLAGPOLE

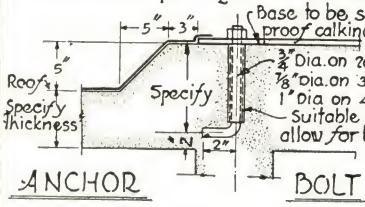
Total Deadweight of unit 3000 LBS.
Live Load per sq. foot 250 LBS.



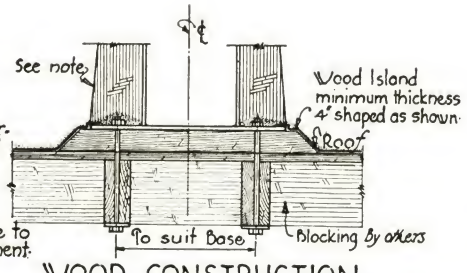
SPECIAL STEEL FRAME CONSTRUCTION above ROOF



SEC. ELEVATION "A-A" Thru CORNER



ANCHOR BOLT



WOOD CONSTRUCTION

RECOMMENDED for 20' & 25' FLAGPOLES ONLY

GENERAL NOTE

For "Typical Elevation of Flagpole" see Dr. No. B-16 on preceding page.

Care should be exercised in building in the anchor bolts, which we furnish, so that no adjustment will be necessary when the base is set in place.

TYPICAL DETAIL ARR'G'T of "EQUIPOISE" FLAGPOLES for VARIOUS ROOFS

DRAWING NO-B-17	JOHN E. LINGO & SON, INC., FLAGPOLES in STEEL & BRONZE CAMDEN, NEW JERSEY	NO SCALE

NEW YORK FLAG POLE CO.

INCORPORATED

Flag Poles, Sockets and Bases of All Kinds

600 West 181st Street

NEW YORK, N. Y.

Metal and Wood Flag Poles

Our flag poles are made of steel, wood, bronze and aluminum and furnished in any size from 8 to 150 ft. They are especially adapted for memorials, public buildings, golf and yacht clubs, schools and institutions. The metal poles are made in one piece, tapered, swaged telescoped jointed steel poles in sections. All sizes of one-piece copper-bearing steel and wood poles are carried in stock.

All poles are furnished complete with halyards, cleats, balls and trucks. The sockets and braces of outrigger poles are made to fasten to wall with expansion or through bolts. Hanger rods are made any length to suit installations.

Specifications for Ground and Roof Poles—Furnish and erect ...ft. flag pole { aluminum one-piece tapered / one-piece tapered steel / telescoped swaged joint steel / tapered wood } for { ground setting, / roof setting with braces } with necessary fittings—all as made and supplied by NEW YORK FLAG POLE CO.

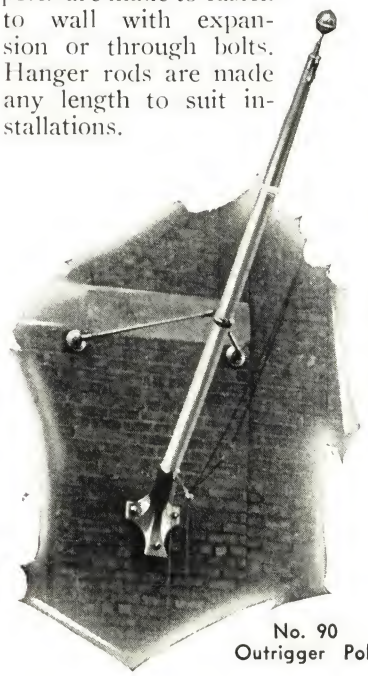
Specifications for Window or Outrigger Poles—Furnish and erect one No. .... outrigger flag pole unit complete with ....ft. flag pole { aluminum one-piece tapered steel swaged joint / steel one-piece tapered / wood tapered } with base and trimming of { aluminum / bronze / benedict nickel / galvanizedcast iron } —all as made and supplied by the NEW YORK FLAG POLE CO.

Revolving Cleats and Trucks

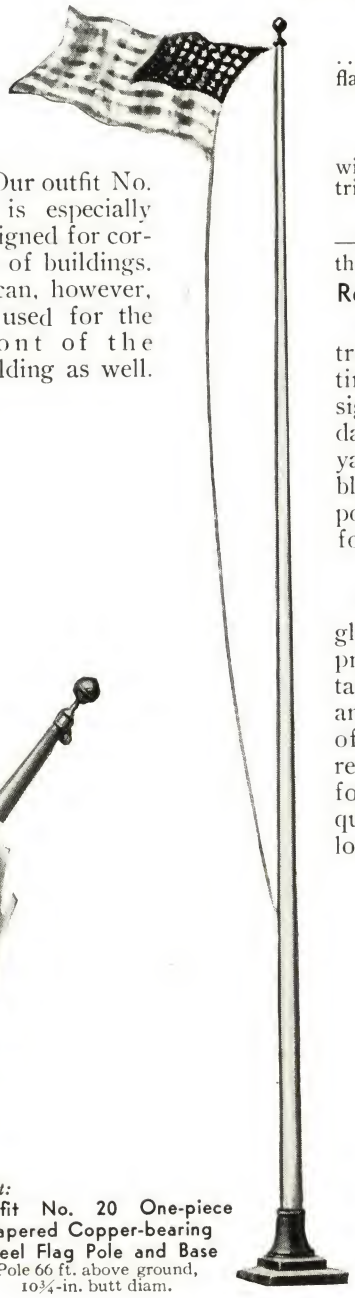
Our revolving cleats and trucks are built on an entirely new principle of design. They prevent the damage of flags and halyards by making it impossible for them to wrap around pole. Send us pole diameter for prices and details.

Service

We shall be glad to submit prices and detail drawings on any type and size of pole—also to recommend poles for individual requirements and locations.

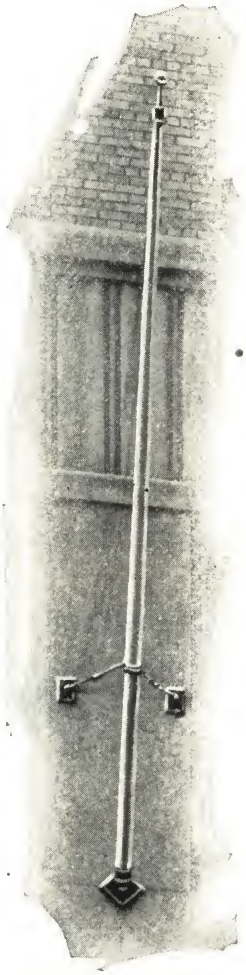


No. 90 Outrigger Pole

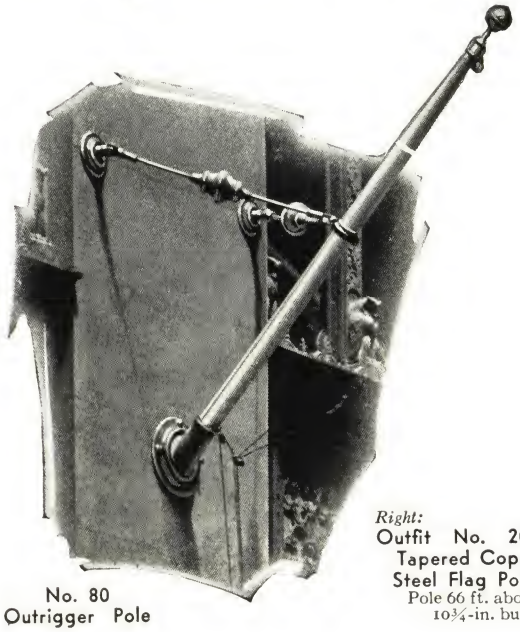


Our outfit No. 85 is especially designed for corner of buildings. It can, however, be used for the front of the building as well.

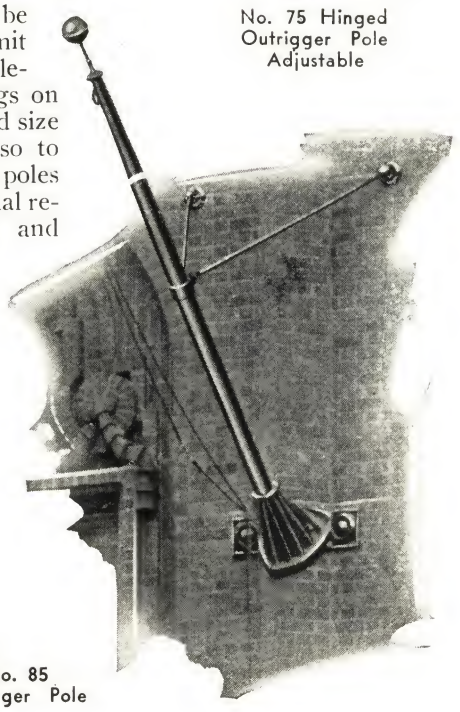
Right: Outfit No. 20 One-piece Tapered Copper-bearing Steel Flag Pole and Base
Pole 66 ft. above ground, 10¾-in. butt diam.



No. 75 Hinged Outrigger Pole Adjustable



No. 80 Outrigger Pole



Right: No. 85 Outrigger Pole

AMERICAN MAST & SPAR CORPORATION

Manufacturers of Flag Poles, Yacht Masts, Spar Booms and Derrick Masts

149th Street and East River

TELEPHONE
LUdlow 4-1050, 1051

NEW YORK, N. Y.

Cable
"MASTSPAR"

Metal Flag Poles

Made of copper-bearing steel, aluminum and bronze.

Made one-piece continuous taper; one-piece continuous taper with entasis; and swaged jointed in several sections.

Wood Flag Poles

Made of especially selected spar timber, machine turned, sand papered and given three coats of best white lead and oil.

Top Mast Flag Poles

Specially designed for yacht clubs, country clubs, golf clubs, homes, and amusement parks. Made in all sizes by shipbuilders who are master craftsmen.

All iron work galvanized. When we build a pole you can depend on a trim, shipshape appearance.

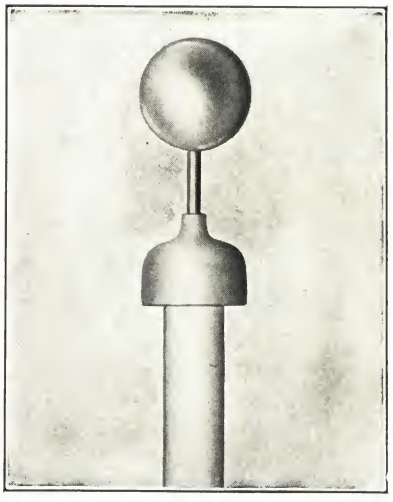
Umbrella Revolving Truck

Our poles are fitted with our Umbrella Revolving Truck No. 30, illustrated below, when specified. This truck, on comparison, shows many superior advantages. It gives the top of the flag pole a dressed appearance. It preserves the life of the pole. In addition, it is ball bearing and rustproof throughout.

Topmast Flagpole with Yardarm
Built like a Ship Mast

Topmast flagpole with yardarms present a very shipshape appearance and make a striking showing when all pennants are flying. Very popular around beach properties and clubs.

Made of copper-bearing steel or selected *Oregon* fir spar timbers, *machine turned* to true entasis. The Topmast is so made that it can be lowered in stormy seasons and for painting. All iron work is galvanized.



Umbrella Revolving Ball Bearing Truck No. 30

Galvanized cast iron or bronze with bronze roller bearing sheaves for the protection of the top ends of wood and steel flag poles of all sizes. Wooden flagpoles will last a lifetime if the top end is protected, by keeping water out of the top. Will also fit steel poles of all sizes. Protect and beautify your flagpoles by specifying an American Mast No. 30 Umbrella Truck.

DIMENSIONS OF TOP MAST FLAG POLES

No.	Net length, ft.	Actual length, ft.	Heel diam., in.	Approx. weight lb.
100	50	55	8	900
100	60	66	10	1500
102	75	82	12	2500
103	100	110	16	5900
104	125	137	20	8000

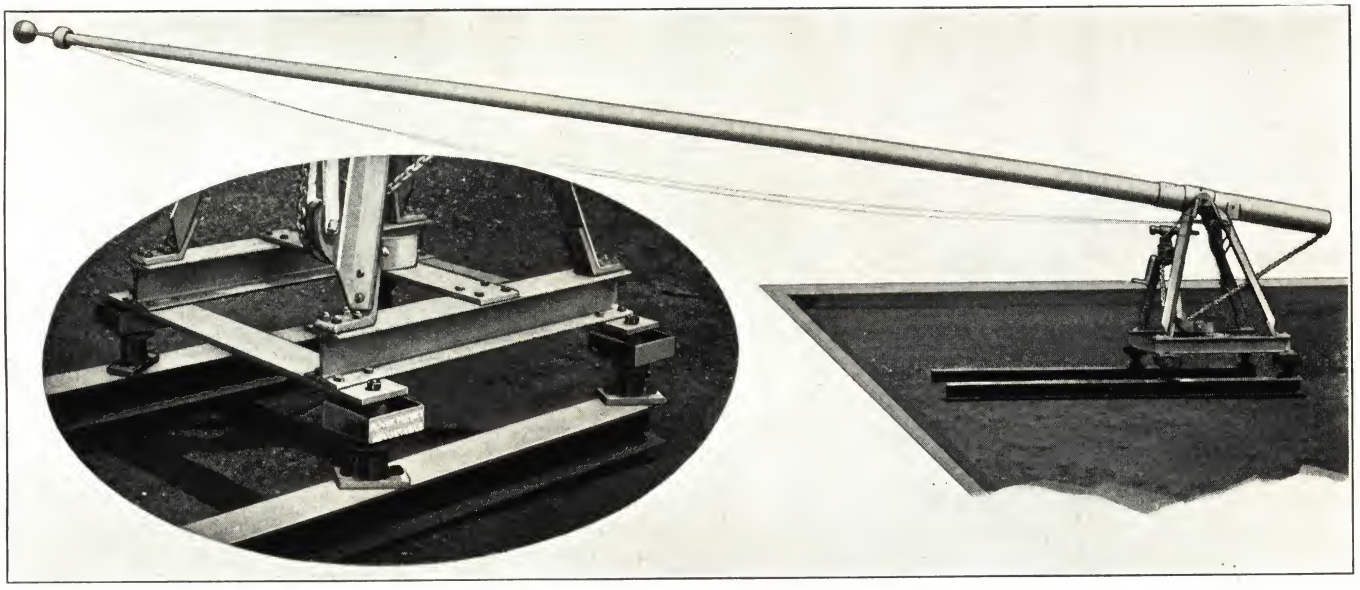
Designed and built by spar makers. Prices upon application.

Ground Pole

Our ground poles are made of both wood and copper-bearing steel. *Wood* flagpoles are made of selected grade spar timber and *machine turned* to true entasis.

Steel flagpoles are made according to flagpole manufacturers' standard specifications consisting of swaged sectional joints or continuous taper.

Prices on application.



Free Wheeling Worm-Driven Tilting Flag Pole No. 48

This tilting flag pole has an exceptionally long base and, as far as we know, weighs less than any other tilting pole made. It is especially easy to raise and lower.

Special attention is called to its simple, efficient, adjustable, flashing pockets. No elaborate drawings or plans are required for its foundation; it is simply fastened to roof concrete or beams.

All sizes up to 40 ft. in wood and steel.

Specifications—Furnish and erect: a ... -ft. wood; or ... -ft. swaged steel; or ... -ft. one-piece tapered steel; worm-driven tilting flag pole with adjustable flash pockets and all standard fittings—all as manufactured by AMERICAN MAST & SPAR CORPORATION.

Diameter of pole to be as recommended by manufacturer. Pole to be painted two coats of best paint before erection, and one coat after erection. Color and kind of paint to be decided by architect.

Framework and Pedestal—To be of steel construction, all galvanized; and to have suitable chain box for housing chain when pole is in upright position.

Drive—Flag pole to be worm-driven and to be operated by a crank handle; to be equipped with piston relief spring so that the flag pole will immediately assume a tilting position when the crank is moved into the relief position.

Chain—To be galvanized, of special quality, and guaranteed to have ultimate breaking strength of 17,000 lbs.

Truck—To be ball bearing umbrella Type No. 30.

Ball—To be of size recommended by AMERICAN MAST & SPAR CORPORATION; to be of copper and covered with genuine gold leaf.

Halyards—To be finest grade manila rope, with snaps and cleats.

Flash Pockets—Pole to be provided with adjustable flash pockets as manufactured by AMERICAN MAST & SPAR CORPORATION.

Erection—Simply attach studs and collars to frame of building; adjust the flash collars to height at which cement is to be poured. Pole can be erected any time, after or during construction of building.

Outrigger Flag Poles—We have on hand stock models of ornamental sockets and fittings for Outrigger or Window Flagpoles; or our Engineering Department can design special outfits to suit your individual needs.

These sockets can be made of any metal you desire.

We will gladly furnish prices and drawings.

THE POLE AND TUBE WORKS, INC.

(Incorporated 1918 to Succeed Pole Department of John Simmons Co., Originators of Tubular Flag Poles)

TELEPHONES
Waverly 2-3807, 3808

230 Pacific Street
NEWARK, N. J.

CABLE ADDRESS
"Poletube"

Products

METALLIC FLAG POLES in Steel, Bronze and Aluminum; ORNAMENTAL PEDESTALS; COMPLETE POLE TRIMMINGS; COMPLETE SETTING APPURTENANCES.

Service

Typical installation plates and erection details for any flag pole project; monumental effects, roof poles, outrigger and ordinary ground set type.

"Conetaper" Steel Poles

An entirely new product, *actually tapered* (smooth in and outside) to a perfectly true conical contour through any *visible* length from 20 to 100 ft., and to diameters as per tables "A" and "B." The visible length is increased to the required total length needed for setting by a splice-welded cylindrical extension piece. Made in Bessemer open-hearth standard pipe steel only at *prices equal to those of our swaged sectional poles of similar diameters.*

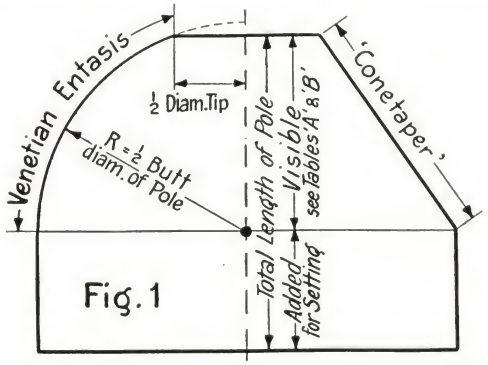


Fig. 1

Half Sections of Contours Compared.

The cost of these "Conetaper" poles being the same as the telescope joint type of equal proportions, we offer them as the utmost obtainable in steel flag poles. Also obtainable in welded bronze or aluminum jacketed construction.

While we use "copper bearing" steel in all "pipe" poles, we cannot guarantee the "copper bearing" alloy for taper poles and other appurtenances of pole installations. While "copper bearing" steel contains about 3 to 5 lbs. of copper per ton of metal, it is neither rust proof nor a superior base for paints.

"Entasis-tapered" Poles

Made in steel, bronze and aluminum alloy. Differ from the "Conetaper" type in their contour which is an exact replica of the world renowned columns at St. Mark's Plaza in Venice (Venetian Entasis). Fig. 1 illustrates the two tapers. The "Entasis-tapered" pole will continue to appeal to designers of monumental flag pole effects and can, unlike the "Conetaper" pole, be produced in steel, bronze or aluminum, and to any desired length and proportionate diameters. We recommend, however, that these proportions be kept in accord with Tables "A" and "B" because departure therefrom may seriously and unnecessarily increase the cost of production. We invite architects to submit preliminary sketches *before specifying* for suggestions on diameters and details of erecting.

"CONETAPER" AND "ENTASIS-TAPERED" POLES

Visible height, ft.	Table "A," Standard			Table "B," Extra Heavy		
	Butt, in.	Tip, in.	Wall thickness, in.	Butt, in.	Tip, in.	Wall thickness,* in.
20	5	3½	¼	.....	.....	.....
25	6	3½	¼	.....	.....	.....
30	6⅝	3½	5/16x¼	.....	.....	.....
35	.....	.....	.....	7⅝	3½	5/16x¼
40	7⅝	3½	5/16x¼	8⅝	4	5/16x¼
45	.....	.....	.....	9⅝	4½	5/16x¼
50	8⅝	3½	5/16x¼	10¾	5	⅜x¼
60	10¾	3½	⅜x¼	11¾	5½	⅜x¼
70	11¾	3½	⅜x¼	14	5½	⅜x¼
75	12¾	4	⅜x¼	15	5½	⅜x¼
80	14	4	⅜x¼	16	5½	⅜x¼
90	15	4	⅜x¼	18	5½	⅜x¼
100	16	4	⅜x¼	20	5½	⅜x¼

*Wall thicknesses are for *steel* only; for bronze and aluminum alloy poles we will furnish specifications based on fabricating and service experience.

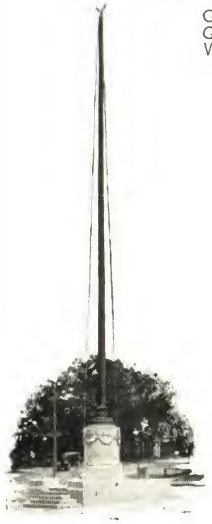
General Details

Transportation of poles is possible in sections up to 60 ft. long, and longer poles are shop fitted with interior tapered splices requiring no local welding, grinding, tapping or riveting. The sections are merely either pulled or pushed together by tackles or jacks.

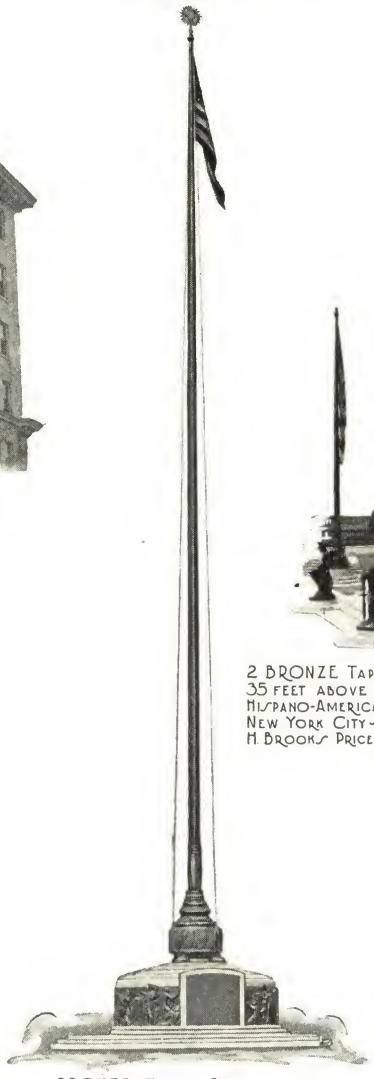
Note A—Both "Conetaper" and "Entasis-tapered" poles in heights upward of above 50 ft. are obtainable now in steel, with a welded bronze or aluminum alloy jacket. Production of several of such poles (for instance three on the Empire State Building, New York City) has developed an efficient method of combating the differential of expansion between the jacket and the steel pole core. In these larger proportions for such poles a considerable saving in metal cost can be effected without sacrifice of strength or compromise on durability. We shall gladly submit further details on request.

GROUP OF OUTRIGGER POLES
GRACE DODGE HOSTEL (Y.W.C.A)
WASHINGTON ——— D.C.

2 BRONZE TAPER POLES
35 FEET ABOVE PEDESTAL
HISPANO-AMERICAN SOCIETY
NEW YORK CITY ———
H. BROOKS PRICE-ARCHITECT



STEEL TAPER POLE (WAR MEMORIAL)
67 FEET ABOVE PEDESTAL ———
SOUTH ORANGE ——— NEW JERSEY
ARTHUR DILLON ——— ARCHITECT



BRONZE TAPER POLE ———
100 FEET ABOVE PEDESTAL ———
UNION SQUARE · NEW YORK CITY
CHAS. B. MEYERS ——— ARCHITECT
ANTHONY DE FRANCISCI · SCULPTOR

STEEL TAPER POLE (WAR MEMORIAL)
50 FEET ABOVE PEDESTAL ———
LINCOLN PARK · NEWARK ——— N.J.
LITCHFIELD & ROGERS · ARCHITECTS
A. H. NIEHAUS ——— SCULPTOR

50 FOOT STEEL TAPERED POLE
NORTH WARD NATIONAL BANK
NEWARK ——— NEW JERSEY
GVILBERT · G. BETELLE · ARCHITECTS

STEEL TAPER POLE ———
80 FEET ABOVE PEDESTAL ———
ELIZABETH · N.J. · COURT HOUSE.

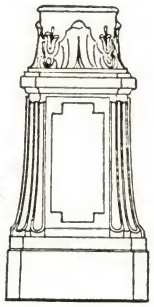
STEEL TAPER POLE (WAR MEMORIAL)
80 FEET ABOVE PEDESTAL ———
PLAINFIELD ——— NEW JERSEY
HELMLE & CORBETT ——— ARCHITECTS

CAST IRON PEDESTALS

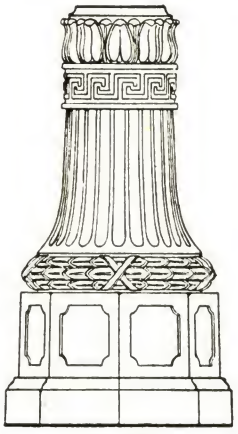
Painted or Galvanized

No. 204
16 in. round
30½ in. high
For 6⅜-in. butt

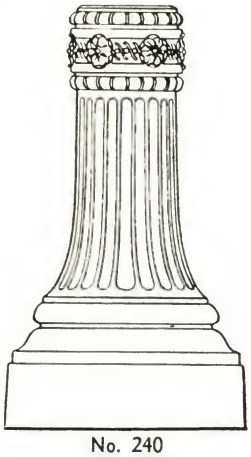
No. 201
22 in. round
33 in. high
For 8⅝-in. butt



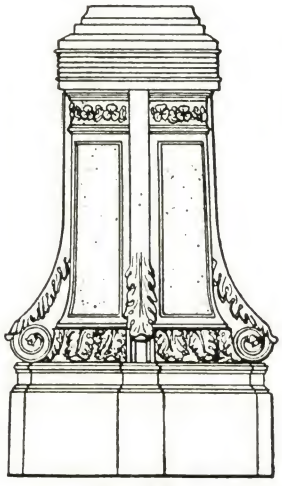
No. 235
18 in. square
36 in. high
For 8⅝-in. butt



No. 239
26-in. octagon. 48 in. high. For 10¾-in. butt



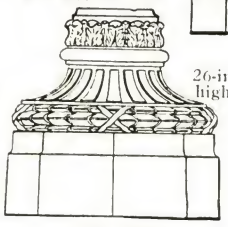
No. 240
30 in. round. 54 in. high.
For 10¾-in. butt



No. 241
32½ in. square. 55 in. high.
For 12¾-in. butt

No. 208
16 in. square
10½ in. high
For 7⅝-in. butt

No. 207
17 in. round
17 in. high
For 6⅝-in. butt



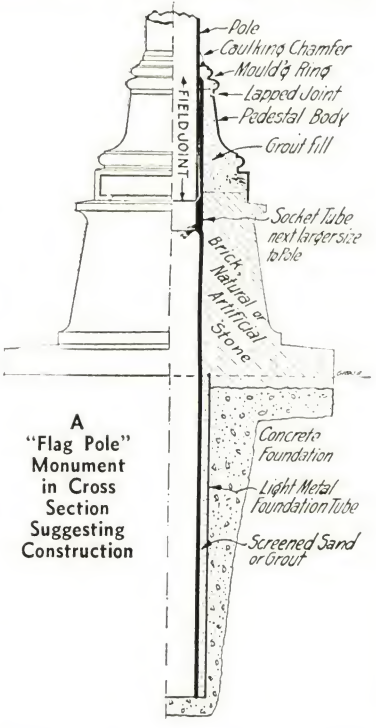
No. 236
24-in. octagon. 28 in. high. For 9⅝-in. butt

This "Class 200" group of pedestals obtainable in iron only. All our pedestals are fitted with soft metal caulking inserts to be caulked to the pole. No cement, molten lead, etc., are needed to insure an airtight joint.

No. 1 (On Plinth)
Height with square base, 36 in., without base, 30 in. For 10¾ to 16-in. butt

No. 2 (On Plinth)
Height with 24-in. square, octagon or round base, 32 in., without base, 26 in. For 5⅞ to 9⅝-in. butt

No. 3
For 12¾ to 18-in. butt
32½-in. octagon. 45 in. high.



A "Flag Pole" Monument in Cross Section Suggesting Construction

No. 4
Round only. 22 in. high, 27 in. diam. For 9⅝ to 12¾-in. butt

No. 70
15½-in., square base only. 12 in. high. For 4½ to 6⅝-in. butt

To architects and builders we would suggest examination of the sketch at the right.

The construction shown avoids difficulties of building and assembly and, eliminating weather hazards, secures the utmost durability at little extra cost.

No. 75

No.	Base diam., in.	Approx. height, in.	Butt diam., in.
75-56	24¾	11½	5⅞ and 6⅝
75-78	18	13	7⅝ and 8⅝

After selection of the pole and a pedestal suitable to its "butt diameter" the "exposed or visible" pole proper is field jointed into a socket tube one size larger than the pole.

Into the concrete foundation build a light sheet metal foundation tube 2 or 3 in. larger than the socket tube so that the latter can be grouted in perfectly plumb. The foundation tube should come up to grade and the socket tube at least 2 in. above the stone work, or as high up into the iron pedestal as possible to facilitate caulking of this field joint. After the stone work is completed the moulding ring is slipped over the bottom of the pole and after telescoping is caulked to the pole with a common caulking tool and heavy hand hammer.

Swaged Poles for Ground Setting (Completely Trimmed)

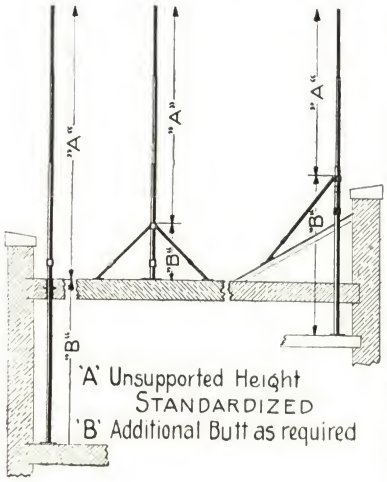
Essential Features of a Ground Set Swaged Steel Flag Pole

Exposed height, ft.	Total length, ft.	Diameter, in. Butt	Top	Ball
Standard				
20	23	4	2 3/8	5
25	28 1/2	4 1/2	2 3/8	5
30	33 1/2	5	2 3/8	6
40	44	5 9/16	2 7/8	6
50	55	6 5/8	2 7/8	8
60	66	7 5/8	2 7/8	8
70	77	8 5/8	2 7/8	8
75	82 1/2	9 5/8	2 7/8	10
80	88	10 3/4	2 7/8	10
90	99	11 3/4	2 7/8	10
100	110	12 3/4	2 7/8	12
125	137	14	2 7/8	14
Light Pattern				
17	20	3 1/2	2 3/8	5
25	28 1/2	4	2 3/8	5
33	37	4 1/2	2 3/8	6
41	45 1/2	5	2 3/8	6
49 1/2	54	5 9/16	2 3/8	6
57 1/2	62 1/2	6 5/8	2 3/8	8
65 1/2	71 1/2	7 5/8	2 3/8	8
73	79	7 5/8	2 3/8	8
80	87	8 5/8	2 3/8	8
90	98	9 5/8	2 3/8	10
100	108	10 3/4	2 3/8	10
Extra Heavy				
25	28 1/2	5	2 7/8	6
30	33 1/2	5 9/16	2 7/8	6
35	39	6 5/8	3 1/2	8
40	45	7 5/8	3 1/2	8
47	53	8 5/8	3 1/2	8
55	61	9 5/8	3 1/2	8
62	69	10 3/4	3 1/2	10
70	77	11 3/4	4*	10
77	85	12 3/4	4*	12
85	93	14	4*	12
90	100	15	4*	14
100	110	16	4*	14

Note: Shipped with fewest possible field joints.

*Takes "Simmons" truck.

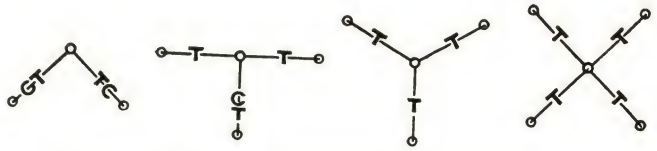
The "Poletube" truck as described is for poles not over 3½-in. tip diameter. Larger tips up to 5½-in. diameter take "Simmons" truck of similar construction. Tips up to 10-in. diameter take our "Giant" truck. All three sizes are full ball bearing body with roller bearing sheaves of bronze.



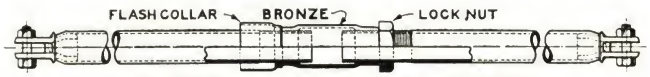
Swaged Poles for Roof Setting

Fittings for Setting Roof Poles—*Braces*—The sketch at the top of the next column shows whether braces will be in tension (T) or in compression (C) or in both (CT).

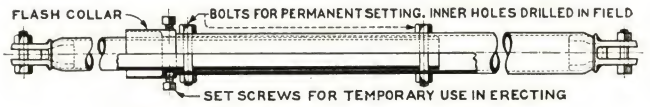
Two CT braces are the least possible and preferable because they minimize the number of roof penetrations.



There are 3 types of braces as shown:



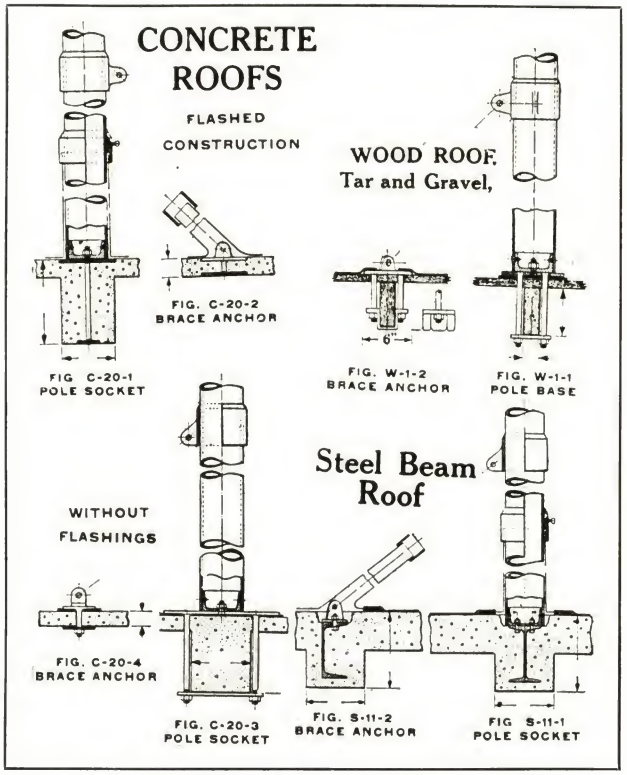
Standard Brace for Compression and Tension



Telescope Brace for Compression and Tension

Tension Brace for Tension Only

We suggest that our patrons leave the selection of suitable braces to our experience and allow us to serve them with the best type at the least possible cost.



Typical Brace Anchors and Pole Bases

STANDARD ROOF POLES

Exposed or unsupported height of pole . . . . . ft.	15	20	25	30	40	50	60	70	80	90	100	125	150
Standard diameter at uppermost support. in.	3 1/2	4	4 1/2	5	5 9/16	6 5/8	7 5/8	8 5/8	10 3/4	11 3/4	12 3/4	14	16
Tip diameter . . . . . in.	2 3/8	2 3/8	2 3/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8	2 7/8

EXTRA HEAVY ROOF POLES

(Recommended for use where greater similarity to wood pole diameters is desired)

Unsupported or exposed height—not less than . . . . . ft.	20	25	30	35	43	51	59	67	75
Extra heavy pole, diameter . . in.	5	5 9/16	6 5/8	7 5/8	8 5/8	9 5/8	10 3/4	11 3/4	12 3/4
Practical tip, diameter . . . . . in.	2 7/8	2 7/8	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	4	4

WINDOW OR OUTRIGGER POLES

Window or outrigger poles with stock fittings are available in either hinged or socket type mounting, as preferred.

Hinged Type—Can be swung in, to parallel the wall, for repainting without the risks of climbing out or other costly rigging or scaffolding at unnecessary expense.

W. P. 5—Illustrated in plainest form; escutcheons are either 6 in. square or 6 in. round or 4 in. wide by 6 in. high. Outfit may be embellished by "twisting" the ¾-in. square hanger by attaching the couplers designed to harmonize with the escutcheons, and by the spearhead shown in W. P. 500.

W. P. 50—Escutcheons are 9 in. round. Cut shows twisted hanger and couplers, purely ornamental and omissible. Spearhead optional also.

All window pole fittings and sockets can be furnished in bronze or aluminum. For similar poles to match, see Note A, page 1.

W. P. 500—Complete as illustrated only.

A "set" of W. P. fittings consists of the three escutcheons, hanger, three wall bolts, gilt copper ball finial, one halyard and one cleat attached. The pole is to be selected from table below and the "Dispensable Extras" (twisting and couplers on hanger and the spearhead) should be specified as wanted or to be omitted, otherwise we will furnish as illustrated.

Socket Type—Permanent setting at 45° angle only. Sockets will support poles to a certain limit, above which they are not safe and pole must be held either by a "Wall Socket" or a hanger W. P. 5 or W. P. 50. Such wall sockets will be specially designed by us on receipt of details of wall construction. See figures "WC" and "WO."

For either installation shown below, we furnish poles in the following two types:

"GRADUATED SECTIONAL" POLES Steel Only			"CONTINUOUS TAPER" POLES Steel, Bronze or Aluminum (see Note A, page 1)		
Butt diam., in.	Tip diam., in.	Height, in.	Butt diam., in.	Tip diam., in.	Height, in.
2⅜	1⅞	8 to 12	2⅞	1½	8 to 20
2⅞	1⅞	12 to 16	3½	2	14 to 22
3½	2⅜	14 to 22	4	2	.....
4	2⅜ or 2⅞	16 to 25	4½	2	14 to 25
4½	2⅞	20 to 30	5	2	22 to 30
5	2⅞	20 to 30	5 9/16	2½	25 to 30
5 9/16	2⅞ or 3½	25 to 30	.....	.....	30

Either type can be furnished to other diameters and lengths.

TYPICAL MOUNTINGS

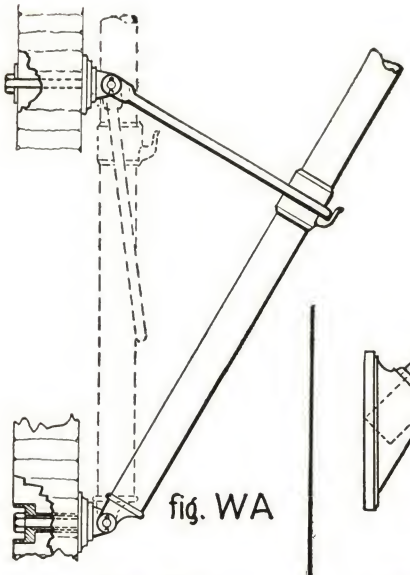


fig. WA

Hinged Type

W.P.5—Takes 2⅜, 2⅞ and 3½-in. diameters, 8 to 16-ft. pole.

W.P.50—Takes 2⅞, 3½, 4, 4½ and 5-in. diameters, 12 to 30-ft. pole.

W.P.500—Takes 2⅞, 3½ and 4-in. diameters, 14 to 25-ft. pole

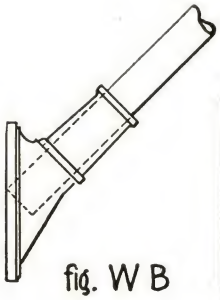


fig. W B

Socket the Only Support

W.P.6—Takes 2⅞, 3½ and 4-in. diameters, 12 to 16-ft. pole.

B12—Takes 3½, 4, 4½ and 5-in. diameters, 12 to 16-ft. pole.

B15—Takes 2⅜ and 2⅞ diameters, 8 to 20-ft. pole

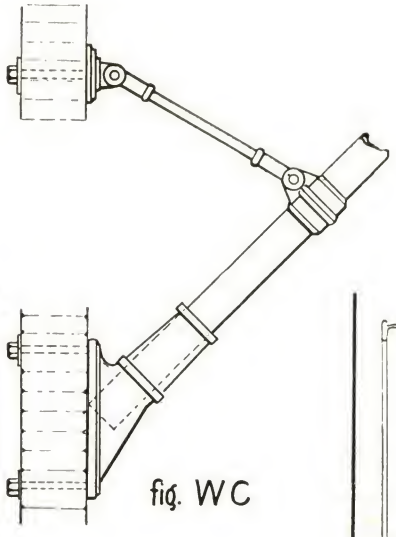


fig. WC

Socket Augmented by Hanger

W.P.6—Takes 2⅞, 3½ and 4-in. diameters, 14 to 25-ft. pole.

B12—Takes 3½, 4, 4½, 5 and 5 9/16-in. diameters, 14 to 30-ft. pole.

B15—Takes 3⅜ and 2⅞ diameters, 8 to 20-ft. pole

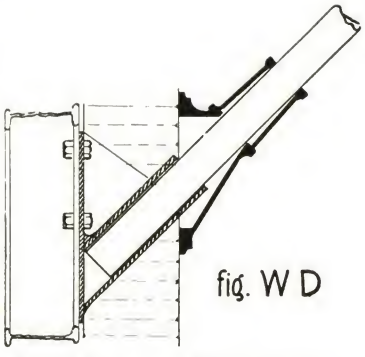


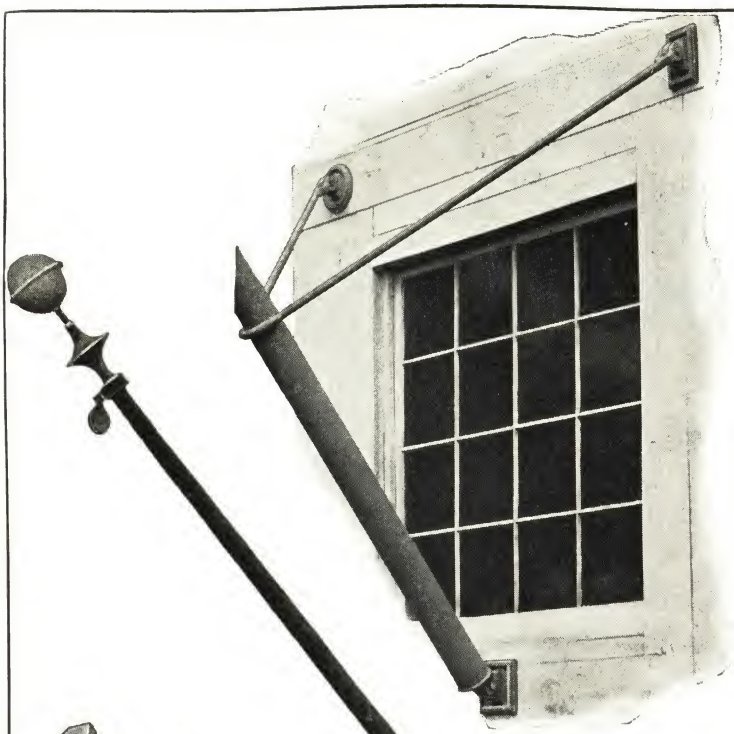
fig. W D

Socket Augmented by Wall Socket

W.P.6—Takes 2⅞, 3½ and 4-in. diameters, 14 to 25-ft. pole.

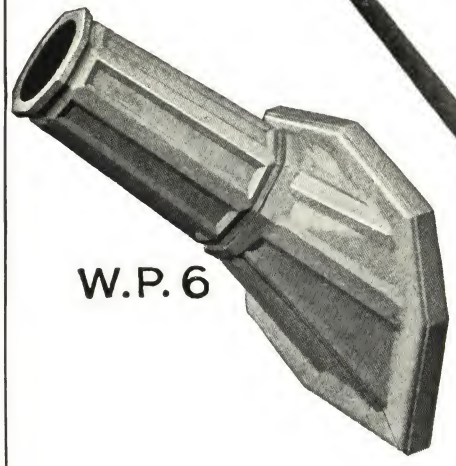
B12—Takes 3½, 4, 4½, 5 and 5 9/16-in. diameters, 14 to 25-ft. pole.

B15—Takes 2⅜ and 2⅞-in. diameters, 8 to 20-ft. pole



W.P. 5

W.P. 50



W.P. 6

W.P. 500

B.15

B.12

WINDOW OR OUTRIGGER POLES

TRAFFIC & STREET SIGN COMPANY

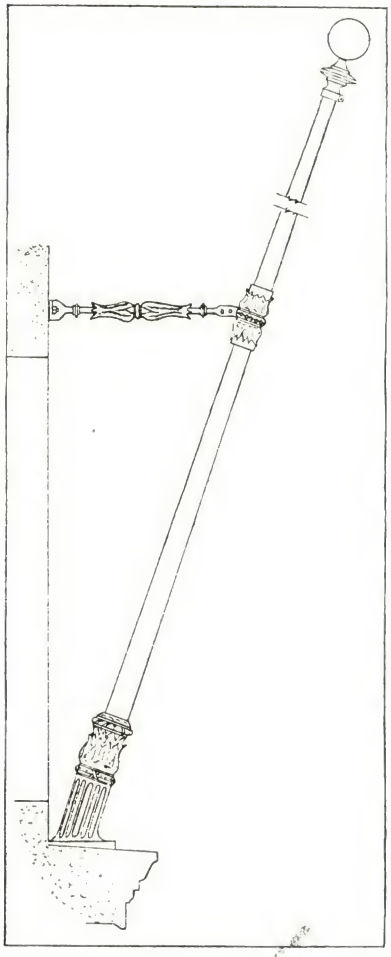
Flagpoles made of Steel, Copper Bearing Steel, Stainless Steel, Bronze and Aluminum

160 Waydell Street,
NEWARK, N. J.

Continuous Tapered Flagpoles

Continuous tapered flagpoles are made by a new process giving pole an increased strength. Material used in construction of these poles is steel, copper bearing steel, stainless steel, bronze or aluminum. Continuous tapered flagpoles are used where the poles have to be of exceptional architectural value. These flagpoles are made to order and conically tapered or with entasis as specified by the architect. The poles are furnished in lengths from 20 to 125 feet and equipped with truck and finial as described under telescoped poles.

60-ft. Continuous Tapered Flagpole, Berkeley Terrace School, Irvington, N. J.

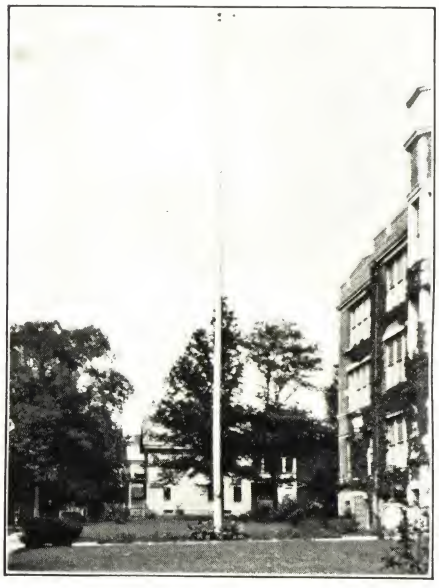


Window or Outrigger Flagpole

Telescoped Sectional Flagpoles

These poles are produced with shrunk, welded watertight joints, neatly graduated. Stock length from 15 to 130 feet. All joints are constructed without the use of lead calking, bolts or rivets. Poles furnished with bronze ball bearing revolving trucks galvanized cast iron or bronze body, bronze spindle, bronze sheaves with bronze roller bearings and finished with 23K gold leaf ball made of 20 ounce copper.

Telescoped poles are shipped in one piece or in sections 22 to 36 feet for erection at the site.



65-ft. Telescoped Flagpole, East Orange High School, East Orange, N. J.

Window or Outrigger Flagpoles

Made in telescoped or continuous tapered construction, extending from face of building at a fixed angle or any angle desired by use of a hinged ornamental escutcheon. Poles are manufactured in length from 15 to 35 feet. Continuous tapered outrigger poles are made of steel, copper bearing steel, stainless steel, galvanized steel, bronze or aluminum. These poles are furnished complete with bronze pulley, block, cleat, halyard, spear head, ball or any other ornamental finial.

COLONIAL FIREPLACE COMPANY

TELEPHONE
Lawndale 0140

4644 West Roosevelt Road
CHICAGO, ILL.

Products and Services

The IMPROVED COLONIAL DAMPER for Fireplaces; the COLONIAL ADJUSTABLE CAST IRON SMOKE CHAMBER; the VICTOR UNIT for Electric Heating Fireplaces.

Also Period-wood Mantels; complete Fireplace Furnishings, such as Fenders, Grates, Andirons, Fire Sets, Trimmings; Special Brass and Wrought Iron Work for fireplaces, hand made Chimney Tops.

Colonial Damper

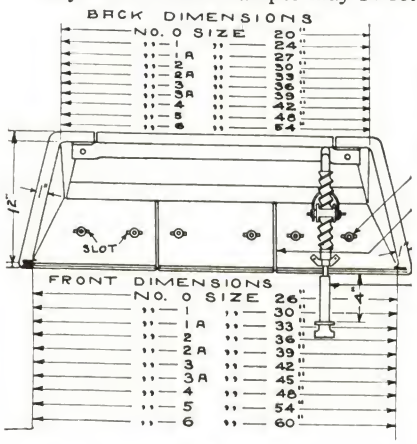
Colonial Damper and Smoke Chamber Form

Correct in Design—The throat and smoke chamber, vital parts of a successful fireplace, are formed quickly and correctly with the Colonial Damper and the Colonial Smoke Chamber Form. Study the illustration carefully. Notice that the cast iron smoke chamber is adjustable, interlocking, rigid, strong—suitable for every type of fireplace. Forming the slanted inside front from damper throat to flue lining is an exclusive feature of the Colonial Smoke Chamber.

Saves Time and Material—It can be set in two minutes. Saves half its cost in labor, and assures a properly formed, smooth interior of the smoke chamber so necessary for the proper functioning of a fireplace.

Perfect Draft Control with the Colonial Damper—Compels correct formation of the fireplace throat. Standard in most specifications because for a generation "Colonial" construction parts have matched the beauty of architects' designs with perfection in operation—a sure means of avoiding the mistakes of workmen that may ruin a fireplace.

Style G Colonial Damper may be set 1, 2, 3 or more courses of brick above the fireplace opening—the only damper with which this is possible. The best fireplace design requires the damper set high to secure a proper draft and avoid smoking.



Takes Up Heat Expansion—Built in sections of best iron castings reinforced with steel angle bar so as to sustain great weight and intense heat. We believe this is the only damper made to take up heat expansion and prevent cracking the face of the fireplace.

Meets the Requirements of Any Design—Colonial Dampers are available in styles A, E and G, as illustrated below. The various styles of operation perfectly adapt the Colonial Damper to fireplace designs of any type round, square or arched openings in marble, stone, tile, wood or any other material.

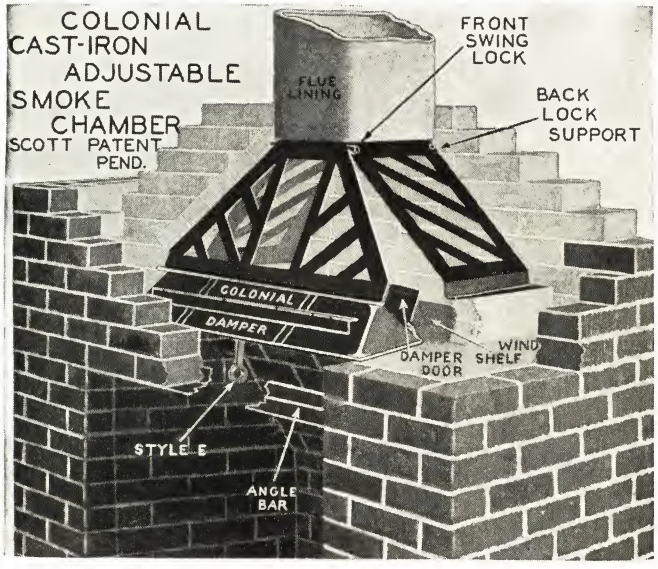
The whole success of the operation of the fireplace depends upon the correct control of the draft. This is assured perfectly by specifying and using the Colonial Damper which compels correct formation of the fireplace throat—the vital part.

Avoids Smoking—A fireplace that does not draw properly will not burn cheerfully. Colonial Damper controls the draft perfectly in checking the fire low or opening the throat wide for a roaring blaze.

Service

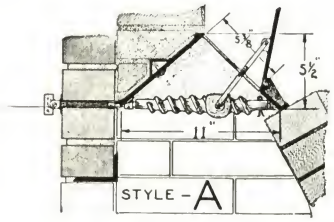
Fireplace Blue Print Details—An informative blue print, *"How to Avoid Mistakes in Fireplace Construction,"* showing best and latest practices of design, sent free on request. Also complete catalogue when requested on business stationery.

Special Service to Architects and Builders—Through the experience of a quarter of a century we have successfully encountered the difficulty of all types of fireplace construction as well as many unusual conditions. We will gladly put this knowledge and experience at your command. For many years a growing number of leading architects have written us freely regarding their fireplace problems.

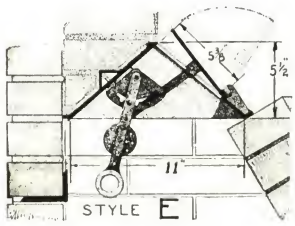


SIZES OF CAST-IRON SMOKE CHAMBER FORM

No. 130 for openings 30 to 34 in. wide with No. 1 or 1-A Colonial Damper
No. 236 for openings 36 to 40 in. wide with No. 2 or 2-A Colonial Damper
No. 342 for openings 41 to 45 in. wide with No. 3 or 3-A Colonial Damper
No. 448 for openings 46 to 50 in. wide with No. 4 or 5 Colonial Damper



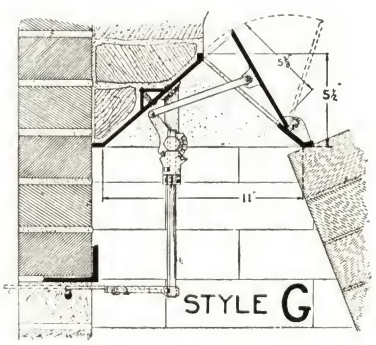
Except for hole in facing necessary with Style A—either operating device can quickly be changed and attached to damper head after it is set.



COLONIAL DAMPER, STYLES A, E AND G

No.	Code word	Width of fireplace opening, in.	Proper size of flue, in.	Weight, crated singly, lb.
00	Count	20 to 23	8x8	30
0	Duke	24 to 28	8x8	35
1	Prince	29 to 32	8x12	40
1-A	Valet	33 to 35	8x12	43
2	Regent	36 to 38	8x16	48
2-A	Butler	39 to 41	8x16	51
3	Queen	42 to 44	8x16	53
3-A	Page	45 to 47	12x12	57
4	King	48 to 51	12x12	63
5	Rex	52 to 57	12x16	68
6	Czar	58 to 64	12x16	75
7	Earl	66 to 72	16x16	90

Style A regularly furnished on above code words.
Style E furnished upon adding "universal" to code word.
Style G furnished upon adding "swing" to code word.



BENNETT FIREPLACE CORPORATION

Manufacturers of Bennett Bonded Fireplace and Fireplace Heater-Ventilator

NORWICH, N. Y.

Affiliated with KERNER INCINERATOR COMPANY, MILWAUKEE, WIS.

For List of Representatives, see Kerner Incinerator Company's Pages

The Heritage of the Fireplace

BENNETT BONDED FIREPLACE

Heritage of the days when our fathers gathered about it to avoid the chills beyond its radiant beam, the fireplace descends to us—an ornament. Yet no real home is without one. The additional expenditure is gladly made for the cheerful beauty of the open hearth. Because of faulty construction, resulting in smoking, this investment is frequently lost.

Wasted Possibilities—In the direct radiance of a fireplace the heat is intense, yet it represents but one-tenth of that given out by the fuel. The waste escaping up the chimney, if evenly distributed, would meet all moderate weather heating conditions. The care and expense of maintaining a furnace during these periods would be eliminated. Such a fireplace would quickly pay for itself.

Bennett Fireplace Is Bonded

BENNETT BONDED FIREPLACE unit for wood or coal fireplaces is guaranteed under bond not to smoke. Regardless of outdoor temperature, large volumes of fresh air warmed from 180° to 300° F. are discharged from the registers. This air circulates through the room containing the fireplace and adjoining rooms as well, giving from four to six times the heat of a common fireplace and providing automatic ventilation in addition. It is applicable to any fireplace without restrictions in architectural design or material used.

Bonded by National Surety Company—A guaranty bond, underwritten by the National Surety Company of New York (copy sent on request) insures the fireplace investment for smokeless operation and heating efficiency. This bond covers any fireplace built according to Bennett specifications (governing internal construction only) and in case of failure provides not only for the refund of the purchase price, but also for proper cost of removal and return of unit. This bond relieves the architect, builder, or realtor of any responsibility of fireplace failure.

Guaranteed to Deliver Four to Six Times the Heat—With the BENNETT BONDED FIREPLACE you have a unit that is not only guaranteed (under bond) not to smoke, but will also deliver and circulate heated fresh air in volumes equal to from four to six times the heat obtained from the common fireplace.

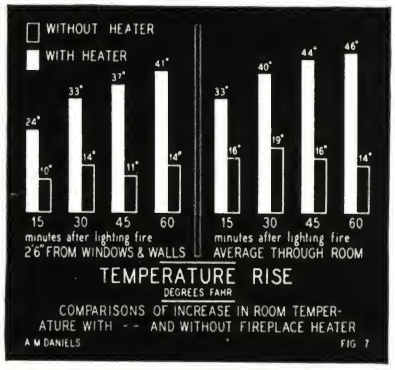


Chart from Tests Conducted by Author of U. S. Government Bulletin on Fireplaces
Outdoor temperature 36° F.

Description and Operation

The Bennett unit consists of a steel form, designed by fireplace specialists, for the proper construction of the fireplace. Built into the unit are a series of heating tubes, running snugly up the back wall of the fireplace.

Fresh outdoor air enters these tubes at the bottom, is heated as it flows up through them, and floods into the room through registers. This heated air circulates not only throughout the room *but to adjoining rooms as well, furnishing distributed heat* unobtainable from only the radiant heat of the common fireplace. The tubes are so spaced as to allow unobstructed escape of smoke from the fire up the flue.

The BENNETT BONDED FIREPLACE is complete with combustion chamber, down draft shelf, flue damper and back wall. It is made of heavy rust resistant materials to outlive the chimney. Patented construction provides for heat expansion, and eliminates warping of flat surfaces. *It greatly simplifies fireplace construction and saves half its cost in labor and materials.*

Bennett Unit Makes Use of Natural Laws—The Bennett unit uses the suction in the house, caused by fireplace draft, to draw in fresh air automatically over the unit's great patented heating surfaces. This neutralizes suction around windows and doors, eliminating practically all cold air drafts, and increases the flow of air through the unit to an unbelievable flood of fresh warm air, where there would be but a sluggish flow if air were taken from the room. See diagrams below.

An air intake damper regulates the volume of air passing through the unit, or shuts it off completely when the fireplace is not in use.

Appearance—The architectural beauty of a room focuses in the fireplace and mantel. Adroit placing of the Bennett unit registers can make them carry out any decorative effect, especially as they are available in brass, wrought iron, tile, etc., in many designs and shapes. All heating surfaces and mechanical parts are hidden.

Up the back wall, covering the heating tubes, run simple, unobtrusive grilles, wholly in keeping with fireplace character. Sidewalls are of fire brick, or other material to secure the effect desired.

Statements Based on Actual Tests—The chart is prepared from tests made by Ara Marcus Daniels, consulting engineer in heating and ventilating, author of Government treatises on fireplaces. A complete report of Mr. Daniels' tests will be forwarded upon request.

Sizes

Six sizes of the unit make possible the construction of fireplaces with any width of opening between 26 and 60 ins.

For Existing Fireplaces

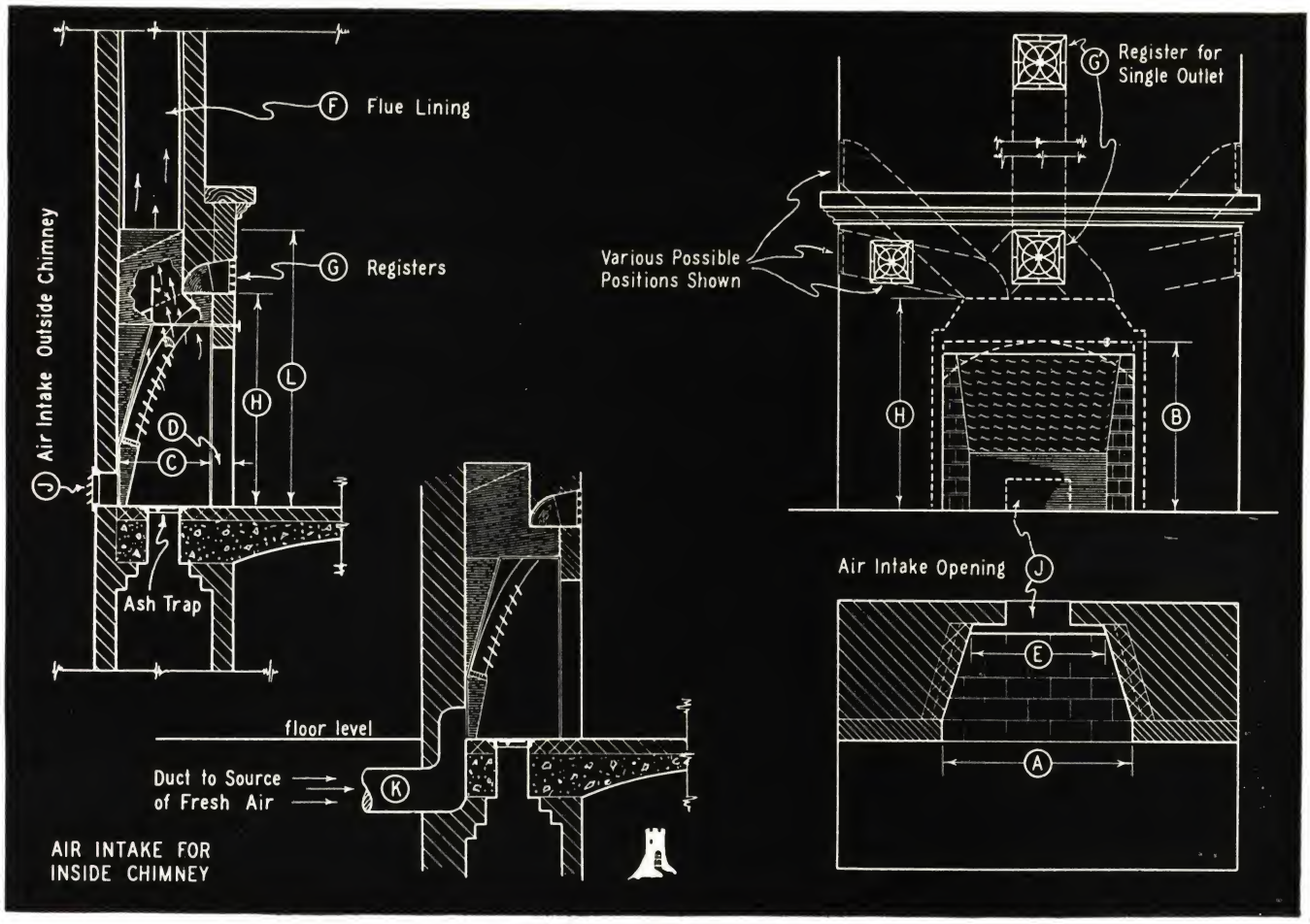
These can be equipped with a similar unit, the BENNETT HEATER-VENTILATOR (Model B) without alteration. This model is not bonded. While it produces the same results in heating and circulating fresh air, it does not correct—or aggravate—a smoking condition. In writing, give size of opening, flue, depth of fireplace at top and bottom, and width in back.

Air Influx—Common Fireplace

The draft up the chimney draws air into the house. Having no other means of entry, this air comes in through cracks around doors and windows. It comes in as sharp, cold drafts—at outdoor temperature. Being cold, it drops to the floor, is drawn toward the fireplace, chills the floors and promptly passes up the chimney. It has furnished little or no ventilation, and has robbed the house of heat

Air Flow—Bennett Fireplace

Fresh air, drawn in from outdoors by suction of the chimney, comes in through the unit in the fireplace. It comes in warm instead of cold. It rises, circulates to various parts of the house, slowly gives up its warmth, descends, passes the breathing levels, drops to the floor and passes up the chimney. It furnishes full ventilation and heating value

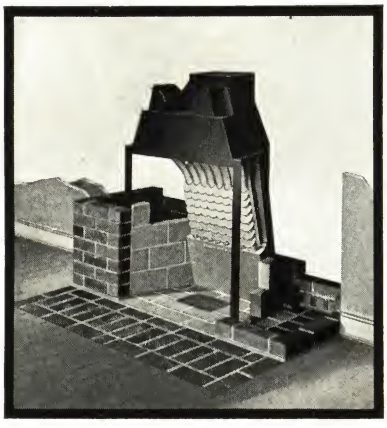


Construction Details of Typical Bennett Fireplace Installation

MEASUREMENTS OF STANDARD SIZES

Size of Unit	30	36	42	48	54	60
A. Front width (maximum), ft.—in.	2—6	3—0	3—6	4—0	4—6	5—0
B. Front height (maximum), ft.—in.	2—6	2—6	2—8	2—10	3—0	3—0
AxB (Area of opening) not to exceed (sq. ft.)	6	7½	9	11	13	15
C. Depth (add facing D for total depth), ft.—in.	1—6	1—6	1—9	2—0	2—0	2—2
D. Facing thickness	As specified					
E. Width in back, ft.—in.	1—8	2—1	2—6	2—11	3—4	3—4
F. Commercial size flue lining, in.	8x12	12x12	12x12	12x18	12x18	18x18
G. Size of register (two or more outlets), in.	5x8	8x8	8x8	8x10	10x10	10x10
G. Size of register (single outlet), in.	8x10	10x10	10x10	12x12	12x12	12x15
H. Minimum register height, ft.—in.	3—4	3—4	3—6	3—9	4—0	4—0
J. Heater intake opening, in.	12x6	12x6	16x6	16x6	16x6	(2) 12x6
K. Intake duct if inside chimney, in.	10	10	12	12	12	15

Chimney to rise at least 20 ft. above hearth, clearing highest point of roof by at least 2 ft. Flue not to be inclined from vertical more than 3 in. per ft. of rise.



Showing Simplified, Rapid Construction with Bennett Unit
Mason has no slanting back wall to lay, no setting of flue damper, no building of smoke shelf, or corbeling of combustion chamber. All details are an integral part of the unit and in tested relation. Merely set the unit on the hearth and build around it.

Users of Bennett Bonded Fireplaces

New or existing homes
Apartment houses
Offices
Public buildings
Resort hotels
Country clubs
Dormitories
Fraternity and sorority houses
Airports
Summer or winter cottages
Sporting lodges
Camps and cottage groups
Health resorts
Boy Scout, Camp Fire Girls and Y. M. C. A. camps
Dude ranches

Versatile as Your Imagination in Outward Appearance
Special registers in a variety of shapes, designs and materials can be located in the mantel, sides, set near the ceiling, or even more remote, in the room behind or bedroom above. Here they are combined with the lighting fixtures.

THE H. W. COVERT COMPANY

Manufacturers of Fireplace Specialties

229 East 37th Street, NEW YORK, N. Y.

Products

COVERT PATENT FIREPLACE DAMPERS and SMOKE CHAMBERS.

Also Cleanout Doors, Ash Dumps, Franklin Fireplaces, Coalhole Covers, Trap Pit Covers, etc.

COVERT FIREPLACE DAMPERS TRADE-MARK

For our page on Floor Drains, see Manufacturers' Index.

HINTS ON FIREPLACE CONSTRUCTION

The three vital points in fireplace construction are damper, smoke chamber and flue. If these are designed and installed in proper proportion to the size of the fireplace opening, the result will be satisfactory.

Covert Dampers are made in three different types, the Old Style Poker or Chain Control, the "Improved" Ratchet Control and the Rotary or Face Control. All are good, substantial in construction and adapted to various styles and types of fireplaces. They are shown in detail on the following pages.

Height and Depth of Fireplace

If the fireplace is too deep, the sides will cut off considerable heat radiation, and if too shallow, the smoke is likely to find its way out into the room. For the fireplace of conventional design the following measurements are recommended:

FIREPLACE OPENING

Width, in.	Height, in.	Depth, in.
24	24	16
30	28	18
36	28	18
42	30	20
48	32	20
54	34	24
60	36	24

Frequently the above measurements must be varied to suit unusual conditions and the following rules should be kept in mind.

If the height is greater than the width of the opening, the flue area should not be less than one-tenth of the fireplace opening.

Regarding the depth of fireplaces there are no arbitrary rules, but for ordinary practice we suggest the following: The depth of fireplaces up to 36 in. in height should be about two-thirds of the height of the opening, and for every 6 in. increase in height over 36 in. 2 in. should be added to the depth.

Splayed sides make the back of the fireplace narrower than the front, and give the fireplace the shape of a reflector, thereby throwing out into the room a maximum of heat. This splay should be about 4½ in. to the foot at each side.

Curving the back of a fireplace should be avoided, as this is likely to throw the smoke out into the room. It is safer to build three courses of brick straight up and then start to slope the back forward on a straight line at an angle that will bring it up under the entire rear flange of the casting.

The soffit, or thickness of the arch, should be kept to 4 in.

Installation Showing "Improved" Damper and Steel Smoke Chamber

Throat and Damper

The iron throat relieves the mason of the formation of the most critical part of the fireplace, and its front flange acts as a support for the arch brick and masonry above, no additional angle iron lintel being necessary.

The damper plate allows the flue to be shut off when not in use, or to cut down the opening when the draft is too great.

Smoke Chamber

Next to the throat, the smoke chamber is the most important part of the fireplace. The funnel shaped sides of the smoke chamber act as a nozzle, giving the smoke a force up the flue. If the sides of the smoke chamber are rough corbelled steps or if the flue is not centered over the fireplace opening, this force up the flue will be greatly diminished.

By the use of the Covert Steel Smoke Chamber, the proper shape, capacity and smooth sides of the smoke chamber are obtained. The saving of the mason's time almost pays for the smoke chamber. This form also induces the building of a wind shelf of adequate size, which prevents smoke being blown into the room by down-drafts.

Flue

A common fault in fireplace construction is that of using too small a flue. In order to make the fireplace draw properly the cross section area of the flue should be about one-twelfth the area of the fireplace opening. As mentioned previously, the proportion should be one to ten if the height is greater than the width of opening.

The draft of a flue decreasing as the height of the chimney decreases, it is advisable to use a one to ten proportion if the height from the hearth to the top of the chimney is less than 20 ft.

In figuring the area of a square or oblong flue, it should be remembered that the outside measurements are usually given. Thus an 8½x13-in. flue has an inside measurement of 7x11½x 80½ sq. in.

For convenience we give inside areas of standard size flues:

8½	x 8½	in., 52	sq. in.
8½	x13	in., 80½	sq. in.
13	x13	in., 127	sq. in.
13	x18	in., 183	sq. in.
18	x18	in., 250	sq. in.
20	x20	in., 297	sq. in.
20	x24	in., 357	sq. in.
8	in. round,	50	sq. in.
9	in. round,	63	sq. in.
10	in. round,	78	sq. in.
12	in. round,	112	sq. in.
15	in. round,	176	sq. in.
18	in. round,	255	sq. in.
20	in. round,	314	sq. in.

To obtain a clean, efficient flue it is very essential that each length of fire clay lining be carefully lined up with the adjoining lengths, and that the mortar squeezing out of the joint be wiped away from the inside of the flue. Necessary offsets in flues should not be more than 30 degrees from the vertical.

It is good practice to carry the lining 3 or 4 in. above the chimney top, surrounding the protruding flue lining with mortar and smoothing off at an incline toward the top of the flue.

Service to Architects

We are always pleased to have architects, owners or builders consult with us regarding details of construction of fireplaces and are glad to give them, without charge, the benefit of our long experience.

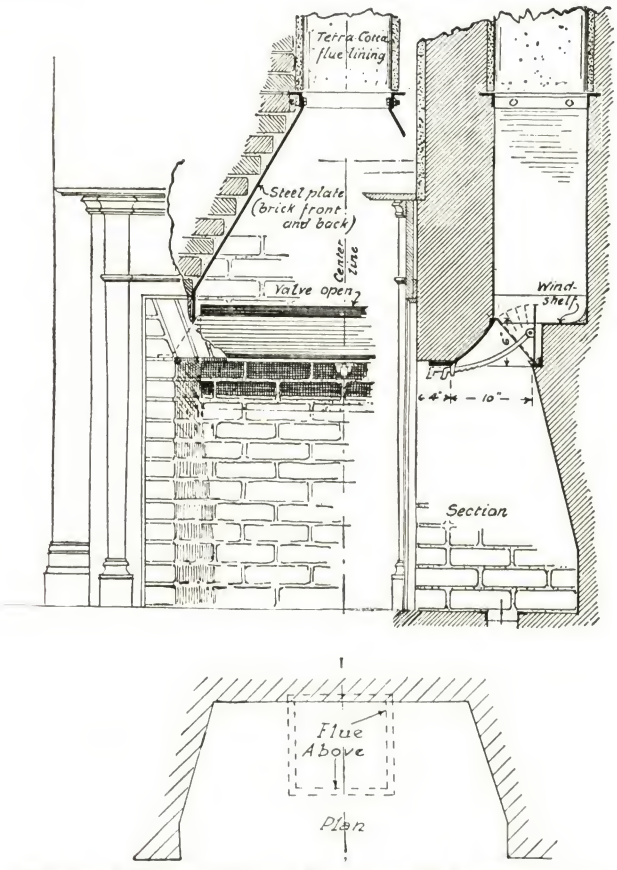
Our booklet of fireplace construction will be sent on application.

COVERT IMPROVED THROAT AND DAMPER

This damper is simple in design and substantial in construction. There are but three parts—the cast iron frame or throat piece, the valve plate and the operating ratchet.

In the installation of the damper the strong frame is used as a lintel to support the masonry arch, assisting in the quick completion of the job.

To remove the valve plate it is only necessary to withdraw the cotter pin connecting the ratchet to the plate—no fussing with complicated mechanism. During construction the plate should be removed to prevent clogging by mortar droppings.

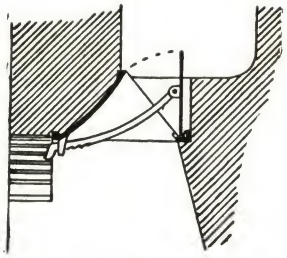


Details of Construction of Fireplace 20 In. Deep with Covert Series E Improved Damper and Steel Smoke Chamber

Improved Damper Series D and E

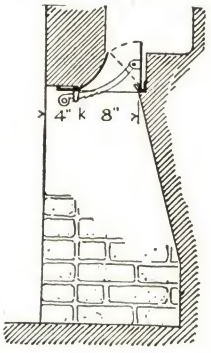
Series D is 8 in. deep (inside measure) and is for fireplaces 18 in. deep or under. Series E is 10 in. deep (inside measure) and is for fireplaces 20 in. deep or under.

For fireplaces deeper than 20 in. we recommend our deeper "Old Style" Dampers shown on the following page

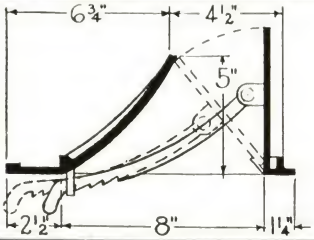


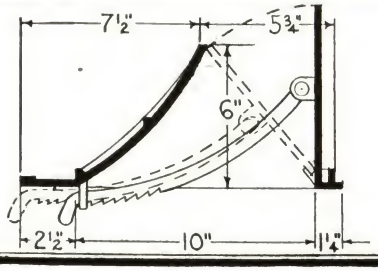
Damper with Front Flange Omitted for Use in Fireplace Having Curved Arch

These are made to order without extra charge

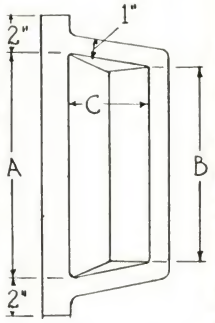


Serics D (8-in. Damper) (Built Into Fireplace 18 Ins. Deep





Damper Number.	Front Width Of Fireplace Opening In Inches.	Base Throat Including Flange A	Opening Of Throat Not Including Flange B	C	Shipping Weight In Pounds	Proper Flue Lining Exterior Dimensions	Equivalent Round Flue Inside Diameter
IMPROVED DAMPER SERIES "D"							
424	24	24	18	8	23	8½ X 8½	8
430	30	30	24	8	31	8½ X 13	10
432	32	32	26	8	32	8½ X 13	10
436	36	36	30	8	34	8½ X 13	10
442	42	42	36	8	38	13 X 13	12
448	48	48	42	8	47	13 X 13	12
454	54	54	48	8	54	13 X 18	15
460	60	60	54	8	60	13 X 18	15
IMPROVED DAMPER SERIES "E"							
524	24	24	18	10	33	8½ X 8½	8
530	30	30	24	10	40	8½ X 13	10
532	32	32	26	10	46	8½ X 13	10
536	36	36	30	10	52	8½ X 13	10
542	42	42	36	10	60	13 X 13	12
548	48	48	42	10	67	13 X 13	12
554	54	54	48	10	75	13 X 18	15
560	60	60	54	10	87	13 X 18	15



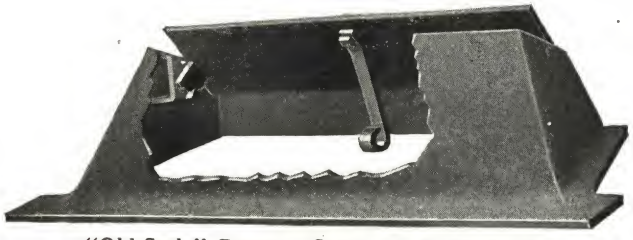
KEY PLAN OF SERIES D & E

Important: The above flue sizes apply only to fireplaces having ordinary height. To determine proper flues for high fireplaces refer to our instructions on preceding page

Smoke chamber for 8½x13-in. flue is reversible and will properly connect, whether the shorter or longer dimension runs parallel with the breast. For 13x18-in. flue it is necessary for us to know which dimension runs parallel with the breast

COVERT OLD STYLE THROAT AND DAMPER

Poker or Chain Operated



"Old-Style" Damper Series A, B, C and F

This Old Style Covert Dome Damper is preferred by some architects and builders on account of its high dome, heavy construction, and because it has stood the test of years of successful use.

The Old Style Damper has a valve swiveled in the center and is operated with a poker by means of a handle fixed to the valve plate—or by chains if desired. The valve may be fixed in three positions, namely: full open, half open, and closed—except Series F, which has only the full open or closed position.

It is made in four different series having different cross sections, making it adaptable to almost any condition that may arise in fireplace construction.

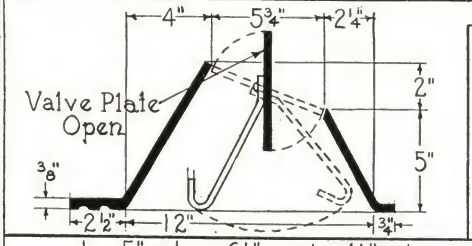
The Series B is the deepest damper and is made up to 7 ft. long.

The steel smoke chamber is used with the Old Style Damper the same as with the Improved.

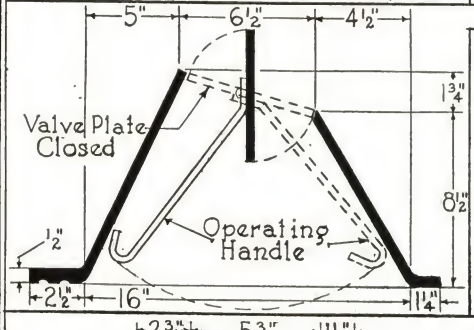
Specification

Every fireplace to have a Covert [Improved] [Old Style] [Old Style, chain control] [Rotary] Damper with Covert Steel Smoke Chamber.

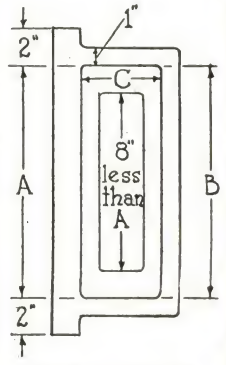
Contractor will confer with THE H. W. COVERT COMPANY as to the selection of damper and steel smoke chamber best suited to the conditions and the proper installation of these items.



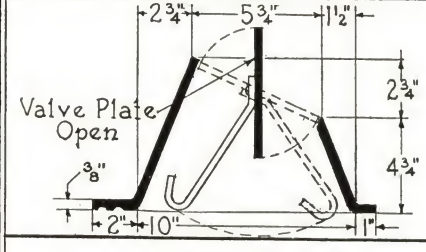
Damper Number.	Front Width Of Fireplace Opening In Inches.	Base Throat Including Flange A	Open'g Of Nos In- B	C	Shipping Weight In Pounds.	Proper Flue Lining Exterior Dimensions	Equivalent Round Flue Inside Diameter.
OLD STYLE DAMPER SERIES "A".							
224	24	24	24	12	26	8½ X 8½	8
230	30	30	30	12	36	8½ X 13	10
232	32	32	32	12	40	8½ X 13	10
236	36	36	36	12	46	8½ X 13	10
242	42	42	42	12	56	13 X 13	12
248	48	48	48	12	66	13 X 13	12
254	54	54	54	12	80	13 X 18	15
260	60	60	60	12	97	13 X 18	15
272	72	72	72	12	110	18 X 18	20



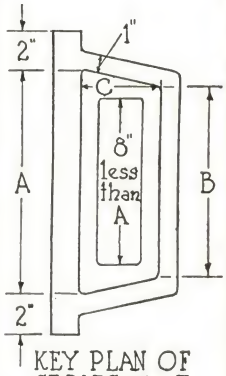
OLD STYLE DAMPER. SERIES "B".							
36½	36	36	36	16	85	8½ X 13	10
42½	42	42	42	16	93	13 X 13	12
48½	48	48	48	16	105	13 X 13	12
54½	54	54	54	16	120	13 X 18	15
60½	60	60	60	16	130	13 X 18	15
72½	72	72	72	16	176	18 X 18	20
84½	84	84	84	16	210	20 X 24	22



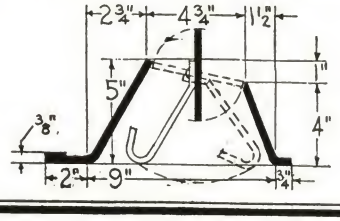
KEY PLAN OF SERIES A & B



OLD STYLE DAMPER. SERIES "C".							
30	30	30	24	10	36	8½ X 13	10
36	36	36	30	10	46	8½ X 13	10
42	42	42	36	10	56	13 X 13	12
48	48	48	42	10	66	13 X 13	12

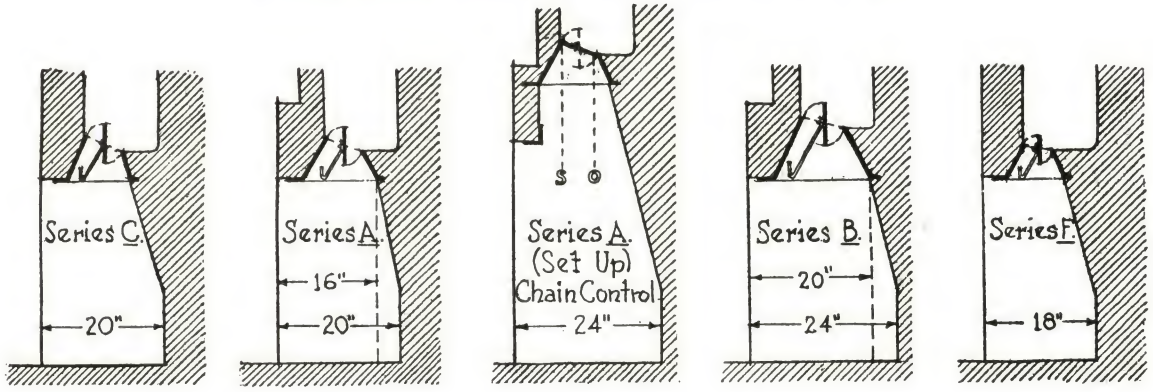


KEY PLAN OF SERIES C & F

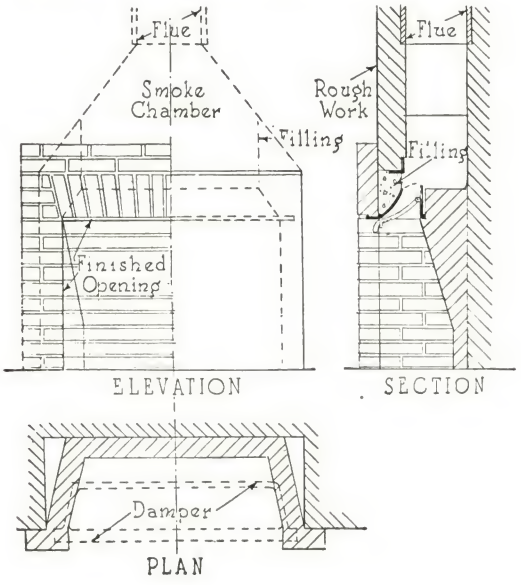


OLD STYLE DAMPER. SERIES "F".							
724	24	24	18	9	25	8½ X 8½	8
730	30	30	24	9	30	8½ X 13	10
732	32	32	26	9	32	8½ X 13	10
736	36	36	30	9	35	8½ X 13	10
742	42	42	36	9	40	13 X 13	12
748	48	48	42	9	48	13 X 13	12

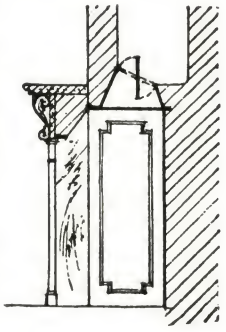
Sections Showing How Old Style Dampers Are Used



Below is a suggested method of building the finished fireplace after the rough construction is done.



Build the rough opening with square jambs, allowing a space for the finished lining. Omit the damper in rough construction and keep rough arch about 8 in. higher than finished opening. When the finished facing and lining are built, rest the damper on the finished jambs. Steel smoke chamber cannot be used in this case and smoke chamber must be carefully formed in the rough construction. If straight back is desired use deeper Old Style Damper.



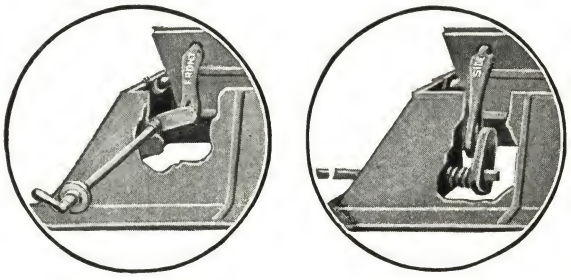
Low French mantels present rather difficult problems. The best treatment is to set the damper as far forward as possible in the rough work and raised a few inches above the finished opening to avoid a broad level soffit.

This suggestion applies to any mantel having considerable projection beyond the line of the chimney breast.

Rotary Damper—Face or Side Control

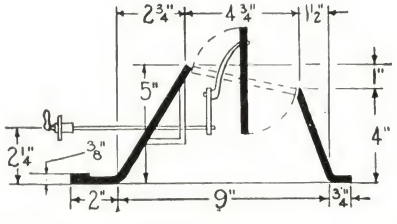
This damper is operated by a polished brass lever handle either from the face or the side of the fireplace. Avoiding the usual worm gear we use a simple lever movement that cannot become clogged with soot or put out of use by rust.

A shaft 24 in. in length is provided with each rotary damper so that it may be connected to operate through the side of the fireplace if front operation is not desired.



Front Control — Side Control

Damper Number	Front Width Of Fireplace Opening In Inches	Base Throat Including Flange A	Open'g Of Not In- B	C	Shipp'g Weight In Pounds	Proper Flue Lining Exterior Dimensions	Equivalent Round Flue Inside Diameter
THROAT AND DAMPER						FLUE	
FACE OR SIDE CONTROL DAMPER							
624	24	24	18	9	25	8½ X 8½	8
630	30	30	24	9	30	8½ X 13	10
632	32	32	26	9	32	8½ X 13	10
636	36	36	30	9	35	8½ X 13	10
642	42	42	36	9	40	13 X 13	12
648	48	48	42	9	48	13 X 13	12



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LOS ANGELES, H. W. Brautigam, 923 E. Third Street—Trinity 8282
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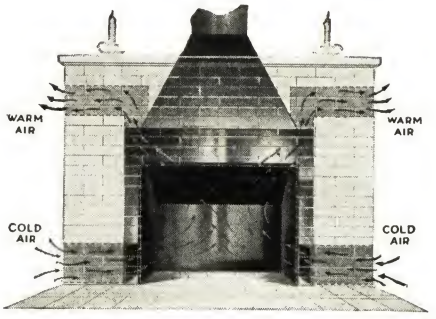
SPRINGFIELD, MASS., W. L. Todd, 804 Belmont Avenue
WINTER HAVEN, FLA., E. C. Hawley, Central Arcade Building

Heatilator Fireplace Unit

Guesswork Taken Out of Fireplace Construction

The architect recognizes the need for some method of standardized fireplace construction. While he is generally able to preserve the art of his design, there is no assurance that the mason will follow accepted or specified details of internal construction. The result is too often purely ornamental while the client has desired and expected a usable fireplace. Even where careful design and supervision has assured usability, there is no hope of attaining even 15% heating efficiency—a waste of 85% of the full heat.

With the development of the Heatilator, guesswork has been taken out of fireplace construction. Design has been standardized and the architect has been freed from the necessity of constant supervision during the building of the fireplace. Every Heatilator installation is guaranteed to operate without smoking. Heat formerly wasted up the chimney is utilized as a new source of comfort during the unseasonably cool weather. And, most important, client satisfaction is assured.



The cold air enters the heating chamber of the Heatilator at floor level—is heated—then returns to the room through upper openings

A Scientifically Designed Fireplace Form

The Heatilator is a correctly designed form around which the fireplace masonry is built. Complete from floor to chimney flue, it includes the firebox, damper, downdraft shelf, and smoke chamber. Where the Heatilator is used, no firebrick are needed for the sides and back of the firebox, no smoke chamber need be designed, no damper need be bought—all are a part of Heatilator construction.

The design of the Heatilator is scientifically correct from architectural and engineering viewpoints. The ratio of the opening area to the flue area is ten to one. An unusually large down-draft shelf is provided. Flue size is regulated by the Heatilator dome. Any guesswork on the part of the mason is eliminated and a fireplace that will burn satisfactorily *and without smoking* is assured.

An Attractive Fireplace for the Living Room
R. S. Sillsbee, Architect, Elyria, Ohio

New Source of Heat

The double walls of the Heatilator form a heating chamber which surrounds the fire on top, back, and sides. Cold air is drawn into this chamber through grilled openings at floor level—is heated—and then sent back into the room through other openings higher in the masonry. This heat was formerly wasted up the chimney. Now it becomes a real source of comfort for cool evenings during spring and fall when the central heating plant is not operating. For southern homes, summer homes, mountain cabins, and camps, it is often the only heating equipment necessary.

General Appearance of Fireplace Remains Unchanged

You are free to use the Heatilator with any style or period fireplace—with any type of material. The unit itself is completely enclosed by masonry. Only the cold air intake and warm air outlet grilles, blending inconspicuously into the design, indicate an improved method of construction. And if you wish, they, too, may be placed out of sight in the ends to leave the face of the mantel unchanged in any way.

A number of actual Heatilator Fireplaces, together with some designs suggested by well-known architects, are shown on these pages. They serve to illustrate the complete freedom in design and masonry. Build just the fireplace you want but build it around the Heatilator to guarantee that both you and your client will be completely satisfied.

Test Shows the Amount of Extra Circulated Heat

On February 16, 1931, A. R. Acheson, Consulting Engineer, made a test to determine the maximum heating capacity of the Heatilator. The test was made with a 39-H Heatilator, installed in a one room (16 x 14 ft.) log cabin at Dewitt, N. Y. Here is his report:

"At the start of the test the temperature in the room was 28°F. and the outdoor temperature was 20°F. Twenty-nine and one-half minutes after the fire was lighted the room temperature, 4 ft. 6 in. above the floor, at the rear of the room, was 72°.

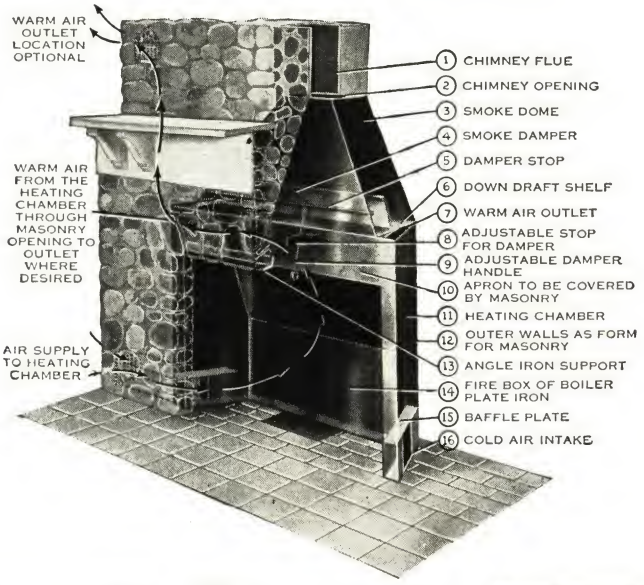
"The air began to circulate two minutes after the fire was started. After ten minutes, the air was leaving the upper grilles at 240°. In twenty-five minutes, the air temperature was 330° at which temperature it stayed practically constant.

"A good bright fire was maintained during the test (72 lbs. of wood burned in 77 minutes). The room temperature was raised to 72° approximately twice as fast as would be done by the amount of steam radiation or size of furnace register usually installed in a room of this size."

(Signed) A. R. Acheson.

Heatilator Fireplaces Cost Little More

You will doubtless be surprised to know that Heatilator comfort and efficiency adds but little to the cost of the completed fireplace. The Heatilator itself is not expensive, and it saves the cost of firebrick, damper and smoke chamber to cover half its own cost. Less masonry is required, the mechanical designing is done and the builder is ready to start work without planning or unnecessary labor. Hence there is also a material saving in time and labor.



To Include Heatilator In Your Specifications

The inner lining or form for the fireplace including smoke chamber, smoke shelf, and damper shall be a complete unit constructed of copper-bearing iron as manufactured by the Heatilator Company. The unit shall have all seams electrically welded and shall be accurately placed and enclosed with common brick. Provide air intake and outlet passages as indicated on drawings, finishing with grilles of [cast iron] [moulded clay tile].

Above:
Phantom View of a Heatilator Fireplace

Showing the interior construction and built-in parts of the Heatilator itself

Left and Right:
Two Heatilator Fireplaces in a Model Home

Paul Hueber, Architect

These two fireplaces are in the living room and basement recreation room of the same home. Note how the outlet grilles are concealed behind the lighting fixtures in the living room fireplace at the left

Location of Intake and Outlet Openings

The location of the Heatilator cold air intake and warm air outlet grilles may be varied according to the space available and to harmonize with the general fireplace design.

Cold air openings may be placed (1) in the front of the mantel at floor level; (2) in the ends of the mantel if it projects sufficiently into the room; (3) or air may be taken from cold air boxes beneath the floor. (4) In cases where it is desirable to take the air supply from out-of-doors, intakes should be carefully placed to avoid winds or drafts that will interfere with circulation.

The warm air outlets may be placed either (1) in the front or (2) the ends of the mantel; (3) below or (4) above the mantel shelf; (5) near the ceiling in the front or (6) ends of the chimney; or (7) in the mantel shelf itself. If desired (8) they can be run through the rear of the chimney to an adjacent or (9) upper room. Where outlet grilles are placed some distance from outlets in the Heatilator, asbestos covered metal pipes should be used to conserve the heat and speed up circulation.

Service and Information

Heatilator Fireplaces are sold by leading building supply dealers. If your local dealer does not carry a unit in stock, ask him to order one for your inspection—without obligation.

Our Engineering Department or our factory representative in your territory will be glad to assist you at any time with special Heatilator fireplace designs and information. Where special grilles are desired, send sketches for detailed information and prices.

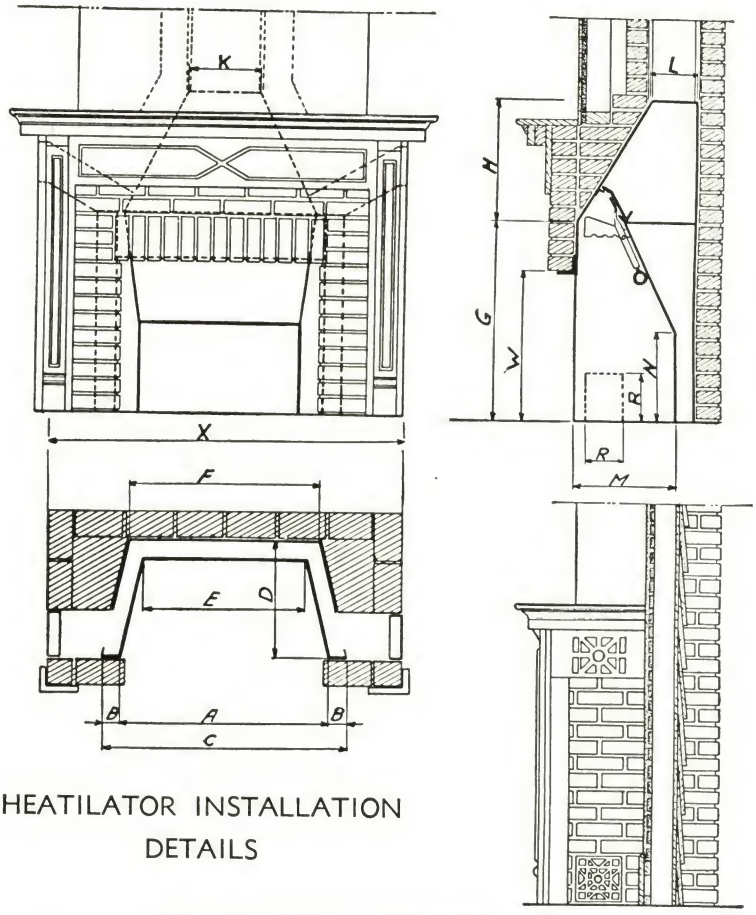
Features of Construction

The Heatilator is made of special rust-resisting, copper-bearing iron. All surfaces that come in contact with the fire are heavy $\frac{3}{16}$ in. boiler plate. The firebox is seamless at points of service. The outside shell acts as a form only around which permanent masonry is to be built—but here also heavy copper-bearing iron is used and seams are electrically welded.

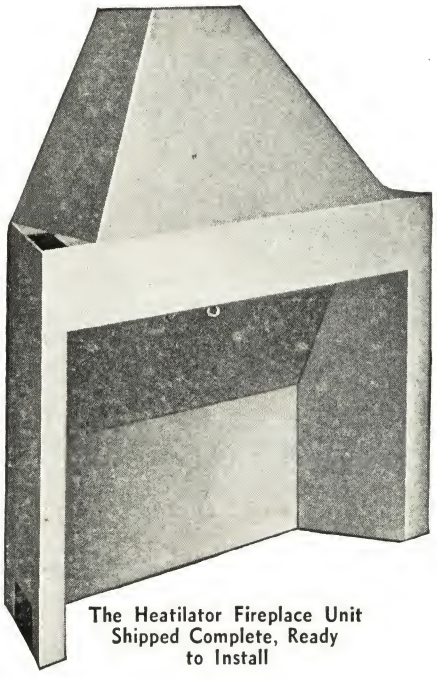
Durability is reasonably insured over a long period. Repairs if ever required are not more difficult or more expensive than replacement of masonry which tends to disintegrate under severe usage. Provision is made in construction and in masonry for the slight expansion from high temperature.

A simple positive poker control damper eliminates mechanism or fixtures in the mantel. All sizes are shipped complete, ready to install, except the 74-H which has dome shipped separately for convenient handling.

Complete instructions for installing the Heatilator accompany each unit.



HEATILATOR INSTALLATION DETAILS



The Heatilator Fireplace Unit Shipped Complete, Ready to Install

HEATILATOR DIMENSIONS AND PRICES

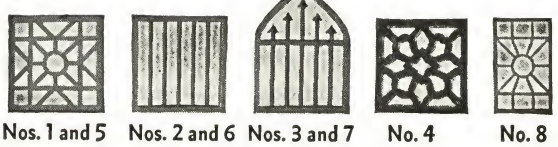
Model	Dimensions, inches														Weight, lb.
	A	B	C	D	E	F	G	H	K	L	M	N	R	W	
18-H	18	3	24	15	15	20	24	12	8	8	12	12	6	18	175
24-H	24	3	30	18	16	21	31	16	8	8	15	13	8	24	200
28 H	28	3	34	18	20	25	32	16	12	8	15	14	8	25	235
34-H	34½	3	40½	20	27	32	33½	20	12	8	17	15	8	26	285
39-H	39	4	47	21	32	38	36	20	12½	12½	17	17½	8	28	340
44-H	44	5	54	25	32	40	42	24	12½	12½	20	17	8	31	465
50-H	50	6	62	26	38	46	44	26	16	12	20	19	10	33	580
62-H	62	8	78	28	44	55	48	36	16	12	22	22	10	35¾	780
74-H	74	10	94	30	50	64	56	36	24	16	24	24	10	38½	1150

Grilles or Registers

The five decorative grilles shown below have been designed especially for use with the Heatilator. All are made of oxidized cast iron with the exception of No. 4 which is hand moulded clay tile.

Grilles Nos. 1, 2, 3 and 4 are 8x8 in.—$1.50 each—for use with Heatilators 18-H to 44-H. Nos. 5, 6, and 7 are 10x10 in.—$2.00 each—for use with larger sizes. No. 8 is 5x8 in.—$1.00 each—for use with 18-H, 24-H, 28-H and also for 34-H where space available is limited.

Supports for the masonry above the fireplace opening can be furnished if specified. Angle iron or arch support available on order. 18 and 24 in.—$1.00; 28 in.—$1.25; 34 and 39 in.—$1.50; 44 in.—$3.00; 50 in.—$4.00; 62 in.—$5.00.

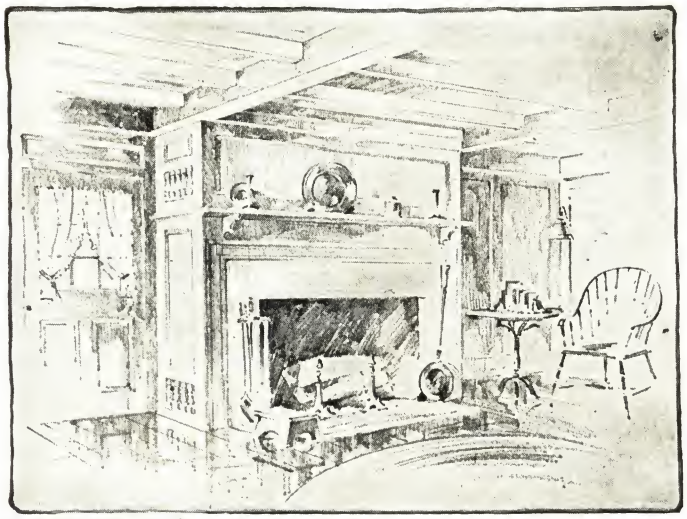


Nos. 1 and 5 Nos. 2 and 6 Nos. 3 and 7 No. 4 No. 8

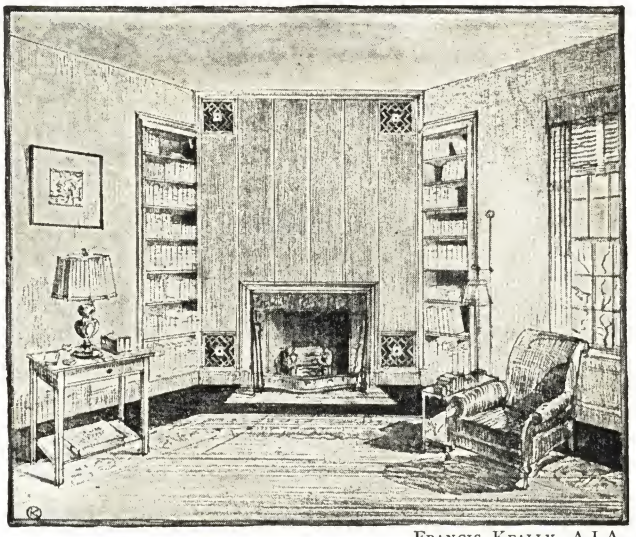
Cobblestone Fireplace, South Bend, Ind.

An ideal fireplace for the summer home. When built around the Heatilator it is often the only heating equipment needed

SOME SUGGESTED HEATILATOR FIREPLACE DESIGNS

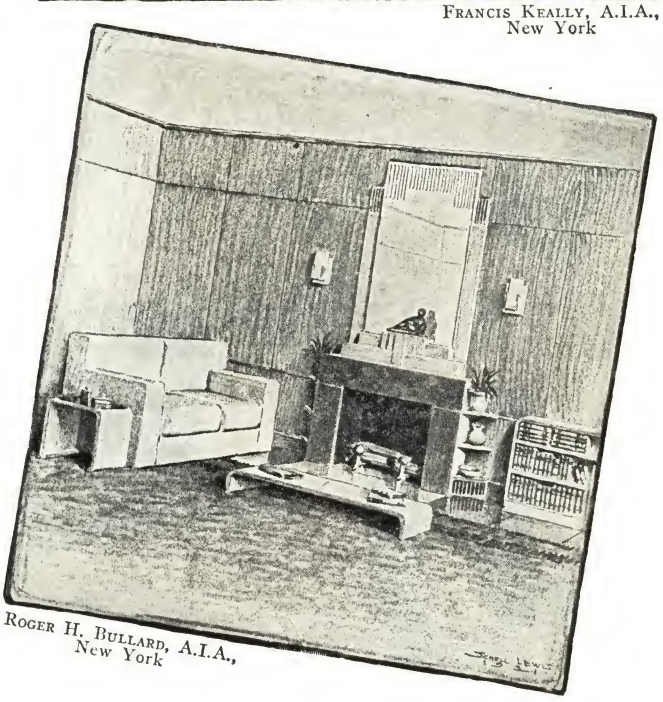


C. A. Ziegler, A.I.A.,
Philadelphia, Pa.

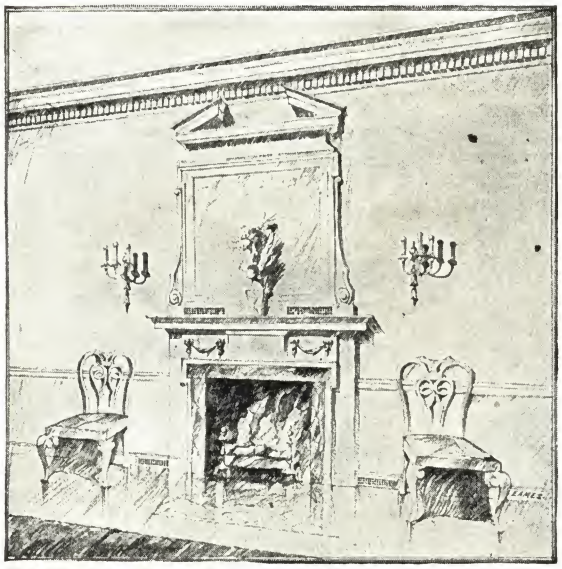


Francis Keally, A.I.A.,
New York

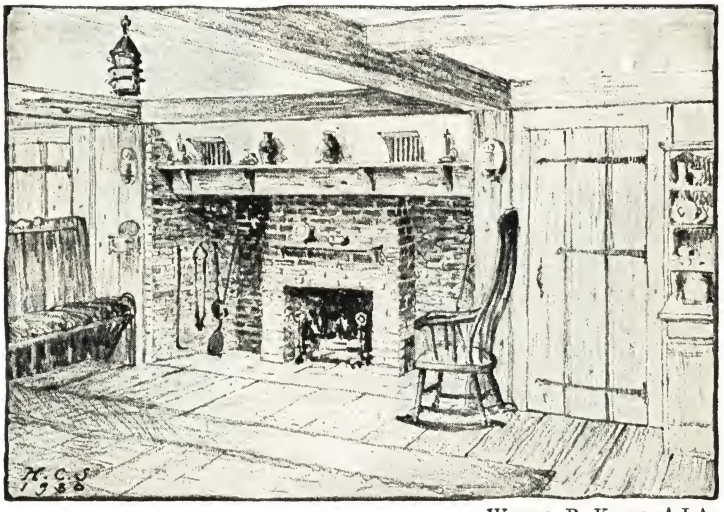
J. Floyd Yewell, A.I.A.,
New York



Roger H. Bullard, A.I.A.,
New York



Dwight James Baum, A.I.A.,
New York



Walter B. Kirby, A.I.A.,
New York

THE DUPLEX HANGER CO.

East 53rd Street and Lakeside Avenue
CLEVELAND, OHIO

BRANCH OFFICES

BOSTON, MASS., 88 Broad Street
CHICAGO, ILL., 6310 Wentworth Avenue
NEW ORLEANS, LA., 1508 Masonic Temple Bldg.
NEW YORK, N. Y., 16 Warren Street
PHILADELPHIA, PA., 2216 W. Columbia Avenue
PORTLAND, ORE., 271 Hawthorne Street

Products

"DUPLEX" JOIST, WALL, CONCRETE BLOCK and I-BEAM HANGER; "DUPLEX" POST CAPS, POST BASES, WALL PLATES and WALL BOXES, for warehouses, factories, heavy mill construction and all other wood constructed buildings.

For Incinerators, see Duplex Incinerator Division in Manufacturers' Index.

When Specifying

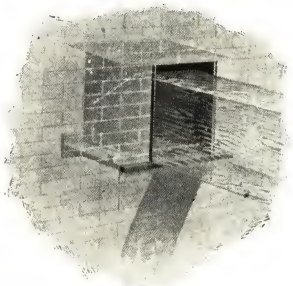
"Duplex" hangers and post caps are designed with a large factor of safety to carry the timbers for which they are intended. If architects and engineers will, when using hangers and post caps, specify "Duplex," the proper hangers and post caps for the timbers will be furnished. Specifications are to be included in carpentry specifications.

POST CAPS AND BASES

"Duplex" Hangers, Single Joist Hangers

Economical hangers for timber framing. Made of malleable iron and every hanger is thoroughly tested.

"Duplex" Joist Hangers reduce the shrinkage of joists to a minimum



"Duplex" Wall Box

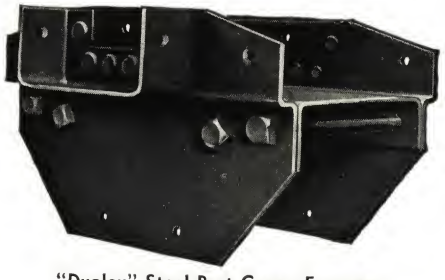
"Duplex" Wall Hanger, Extra Heavy

"Underwriters' type" steel wall hangers for heavy mill construction.

Carry timbers clear of the wall and distribute the load perfectly over the bearing surface of the masonry. Furnished for standard and extra heavy construction

R & L Joist Hanger

For the heaviest type of mill construction. By using this type of hanger, the entire building is tied together laterally. No other method of construction does this. Made in two parts and can be adjusted to fit the various timbers for which they are intended



"Duplex" Steel Post Caps—Four-way Construction

"Duplex" Post Caps are made of mild, open hearth steel and consist of three pieces: a bearing bracket and two side plates bolted together with four heavy bolts. Engineers who have investigated and used this cap are unanimous in declaring it to be an ideal design for rigid construction. Tests have fully proven the great strength of this design and that it is not possible to break the cap when even more than six times the ultimate safe load of the timber is applied.

These caps are furnished for 1-way, 2-way, 3-way and 4-way construction and may be had for timbers larger than the post

"Duplex" Concrete Block Wall Joist Hanger

This hanger for concrete block construction is made with a larger bearing plate than our ordinary wall hangers so as to distribute the load over a greater area of the concrete block. Very practical where it becomes necessary to frame joists into old brick walls or party walls. Avoids the cutting of a large hole

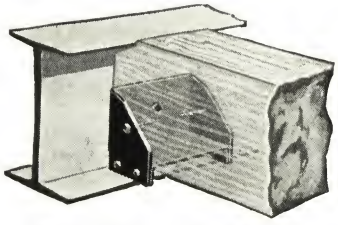
Girder Same Size as Post Below

For Very Heavy Mill Construction

Heavy duty joist hangers combine all the features of the R & L hangers, but are made in one piece, instead of pairs

"Duplex" Steel Post Bases

Are made of steel plates and angles to fit the post. More economical than cast iron plates



"Duplex" I-beam Shelf Hanger

I-beam box and I-beam shelf hangers are noted for being one of the most economical devices for framing wood joists to I-beams. All of the load is carried on the lower flange of the I-beam, this being the only correct method

THE IDEAL HANGER COMPANY

Manufacturers of Timber Fittings for Mill Type Buildings

1270 East 53rd Street
CLEVELAND, OHIO

Products

IDEAL JOIST HANGERS:

Wall Hangers, Wall Boxes and Metal Lumber Hangers.

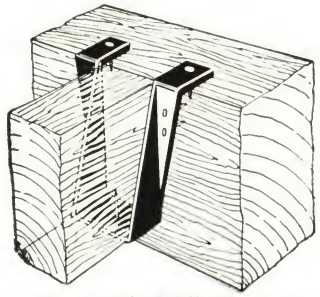
POST CAPS.

POST BASES.

Also Barn Framing Fittings.

Service

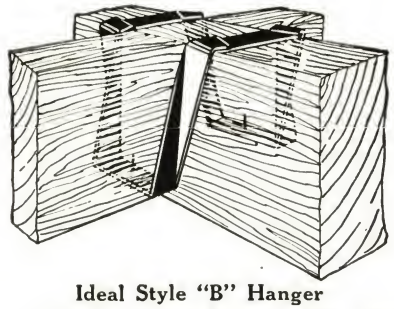
Ideal post caps, Ideal hangers and other Ideal products are made of the best material obtainable by competent workmen on modern machines. Prompt shipments are made from stock. Estimates and quotations cheerfully furnished and designs submitted by engineers who are specialists in timber construction.



Ideal Style "A" Hanger

A single hanger of the best grade open-hearth steel, formed cold to shape best adapted to framing timbers of every size. Fastens to timber with spike or lag screw.

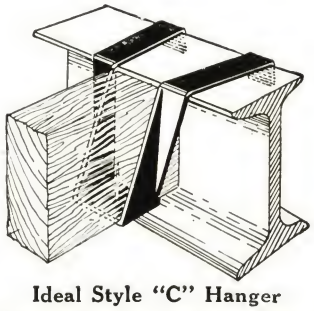
2x6-in. up to 12x16-in. hangers in stock



Ideal Style "B" Hanger

A double hanger for use where joists frame opposite each other on a wood girder or I-beam. Made of two single hangers with riveted strap connections, the strongest possible construction.

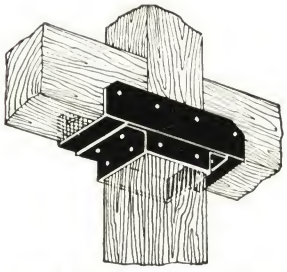
2x6-in. up to 12x16-in. hangers in stock



Ideal Style "C" Hanger

Where timbers are framed to I-beams, this hanger with the arms crossing the top of the girder provides safest and most economical construction. Also used with wood girders.

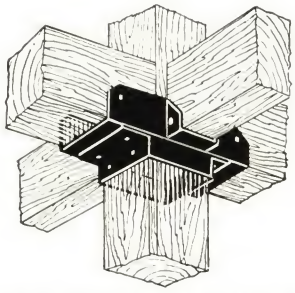
2x6-in. up to 12x16-in. hangers in stock



Ideal Steel Post Cap, No. 2

Easily installed—no framing necessary. Channel of open-hearth steel riveted to socket, provides rigid construction.

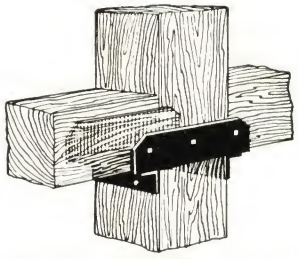
6x6-in. up to 16x16-in. post caps in stock



Ideal Steel Post Cap, No. 2
(Showing 3 and 4-way Construction)

Built with the same attention to engineering standards as other Ideal Framing Products.

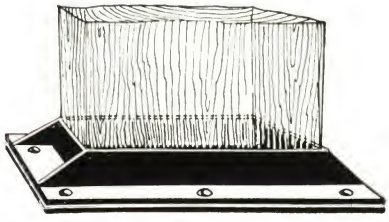
The brackets on the side of the cap are riveted thereon to carry the beams framing in at the side, and are placed so the girder and beams will be flush on top, unless otherwise noted



Ideal Steel Post Cap, No. 3

The strongest light weight post cap made. Meets every demand for framing posts and girders under moderate loads.

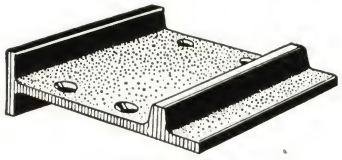
6x6-in. up to 12x16-in. post caps in stock



Ideal Post Bases

A heavy steel plate, with angles riveted thereon, furnishes the best possible socket for timber posts.

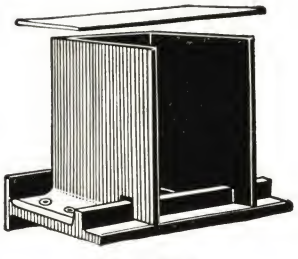
6x6-in. up to 16x16-in. in stock



Wall Plates

One-piece construction of malleable iron, far superior to cast iron. Note features of superiority in use.

Carried in stock in all sizes



Wall Box

To anchor beams in brick walls, and to protect them against dry rot. Malleable plate and steel box riveted thereto.

In stock in all sizes

WOVEN WIRE WORK DIVISION

OF NATIONAL ASSOCIATION OF ORNAMENTAL IRON, BRONZE AND WIRE MANUFACTURERS

WASHINGTON, D. C.

CONTRIBUTORS

CONNECTICUT: HARTFORD, American Wire Works
ILLINOIS: CHICAGO, F. P. Smith Wire & Iron Works, Inc.
CHICAGO, Western Wire & Iron Works, Inc.
KENTUCKY: LOUISVILLE, Kentucky Metal Products Co.
LOUISVILLE, Logan Co.
MICHIGAN: DETROIT, Acme Wire & Iron Works
GRAND RAPIDS, Haven-Busch Co.
NEW JERSEY: AUDUBON, Audubon Wire Cloth Co., Inc.
NEW YORK: BROOKLYN, Bellis Wire Works, Inc.
LONG ISLAND CITY, Kolenik Wire Mesh Corp.
NEW YORK CITY, J. W. Fiske Iron Works
OHIO: AKRON, The Ornamental Iron Works Co.
CANTON, The Columbia Iron & Wire Works Co.
CLEVELAND, Atlas Wire Works
CLEVELAND, The Denby Wire & Iron Co.
OKLAHOMA: OKLAHOMA CITY, J. B. Klein Iron & Foundry Co.
PENNSYLVANIA: PITTSBURGH, Taylor & Dean, Pittsburgh Iron & Wire Works
WILKES-BARRE, Wilkes-Barre Iron & Wire Works, Inc.
RHODE ISLAND: PROVIDENCE, What Cheer Wire Works
TENNESSEE: CHATTANOOGA, Standard Iron & Wire Works
WISCONSIN: MILWAUKEE, Badger Wire & Iron Works
MILWAUKEE, Globe Wire & Iron Works
WAUKESHA, Century Fence Co.

A SIGNIFICANT EMBLEM

The above Craftsmen and Fabricators who display this emblem are pledged to good and efficient execution of Woven Wire Work and the advancement of the art. Firms nearest you will gladly furnish additional information.

Article 7, Code of Ethics—Membership in the Association shall be an assurance to the public of honest and efficient workmanship and material and the most scrupulous observance of the terms and conditions of contracts and service to our customers.

A NEW SERVICE TO ARCHITECTS AND CONTRACTORS

The above members have contributed to these pages for the purpose of furnishing the architect and contractor with authoritative general information on the uses and advantages of woven wire work, standard specifications, and approved modern methods of fabrication.

For estimates, address individual members.

Important—When Asking for Quotations

Standard gauge for steel wire is W&M. As this is in most instances heavier than other gauges, the architect should make certain that all quotations are based on W&M gauge.

Mesh is the opening or space between parallel wires, and as defined by the National Association.

WOVEN WIRE WORK HAS BEEN IN GENERAL USE FOR MORE THAN A HALF CENTURY

For more than a half century woven wire work has been the standard for highest quality in open mesh construction, where utility and good appearance are necessary requirements.

SOME USES OF WOVEN WIRE WORK

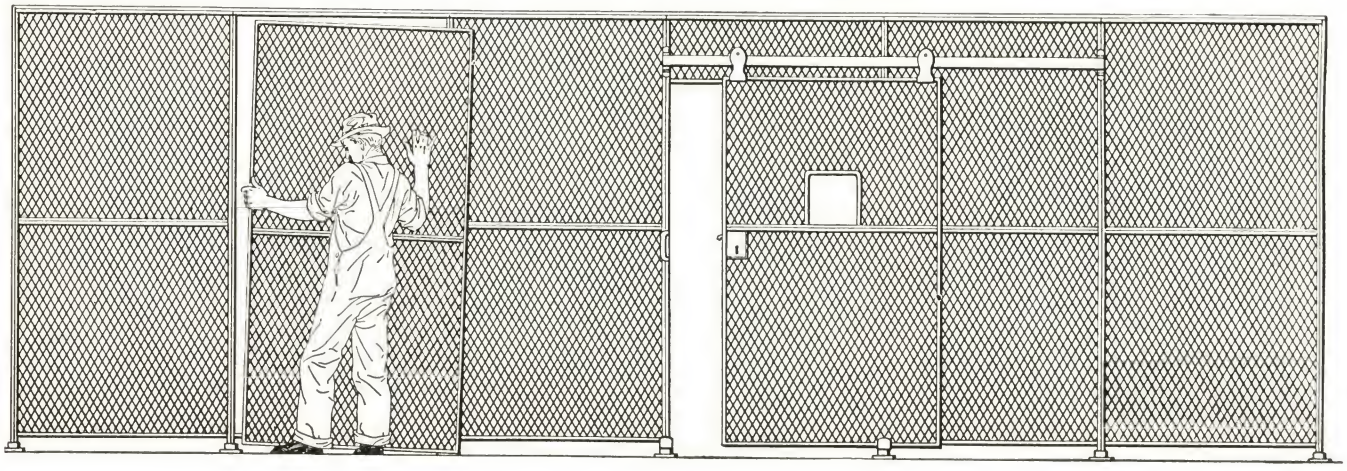
Screen Enclosures and Partitions—

Stockrooms
Toolrooms
Switchboards
Transformers
Elevator shafts
Fire escapes
Cashier cages
Bank cages
Office partitions
Corridors and runways
Stair enclosures
Locker rooms
Departmental divisions

Basement storerooms for apartment buildings and department stores

General Uses—

Window guards for gymnasiums, cellars and exteriors
Door guards
Transom guards
Skylight screens
Bins and lockers
Elevator car tops
Elevator safety gates
Pipe rail screens
Porch grilles
Heating and ventilating grilles
Radiator guards, grilles and screens
Shelves



THE SPECIAL FEATURES AND ADVANTAGES OF WOVEN WIRE

Woven wire work is fabricated entirely from drawn materials and has many adavantages over expanded or perforated products for general open mesh construction. Drawn materials have no fractured surfaces to invite corrosion, and no burrs to cut the hands and gather lint and dust.

In general there is no real substitute for woven wire work in open mesh construction where the following requirements are of prime importance:

(1) Ventilation—Largest percentage of open area.

(2) Lighting—More light due to better diffusion.

(3) Cleaning—All smooth surface; easily kept clean.

(4) Vision—Easier to look through from any position.

(5) Fire—No obstruction to hose stream.

(6) Heating—Maximum circulation of air.

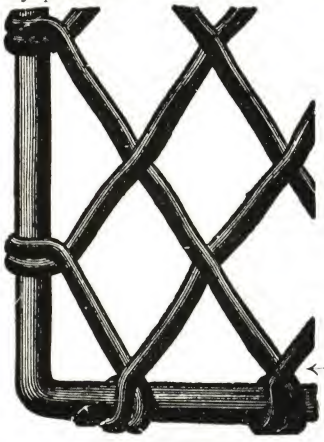
(7) Sound—No interference.

(8) Painting—Easily repainted.

(9) Strength—All wires double crimped and securely interwoven and clinched on drawn metal frames. (See illustrations below.)

(10) Cost—Lowest cost because of economy in manufacture as mesh is woven up for each job, thus eliminating the usual waste resulting when mesh is cut from limited sizes of stock sheets.

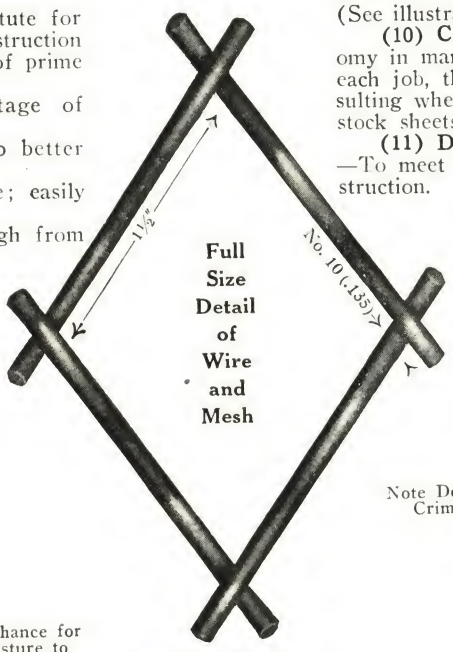
(11) Diversity of Wire Sizes and Meshes—To meet any requirement in open mesh construction.



No Chance for Moisture to Collect

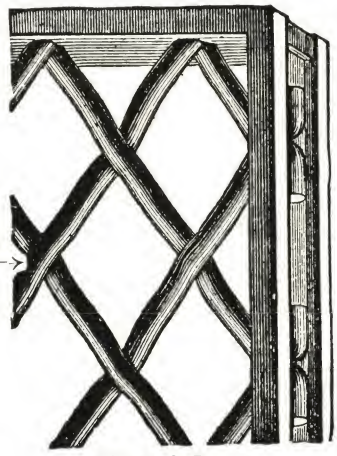
Round Frame

Is generally used for exterior window and skylight guards



Standard Mesh

Mesh shown above is the accepted standard for partitions and window guards. Other meshes are available. Data and recommendations for bank cages, grilles, registers, etc. is given on the following pages under specific headings



Channel Frame

Used for partitions and general interior woven wire work

STANDARD WOVEN WIRE PARTITIONS (INDUSTRIAL TYPE)

Built up of interchangeable sections. Easily and quickly erected by inexperienced labor. Double crimp in wires holds mesh securely in diamond shape and prevents spreading of wire.

All wires are clinched into place through channel frames, holding frames true and straight.

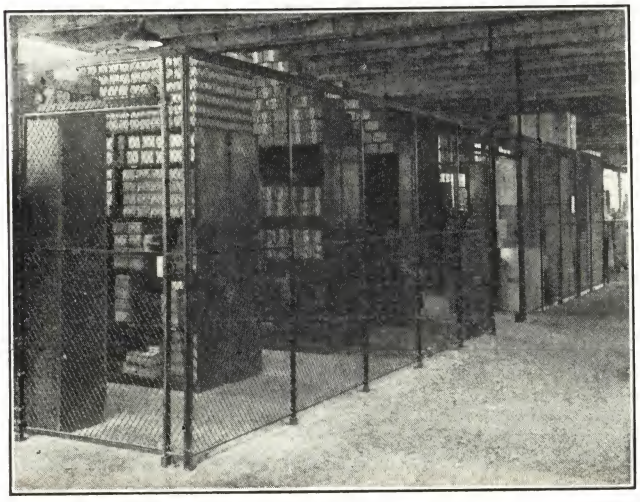
Specifications for Standard Woven Wire Partitions

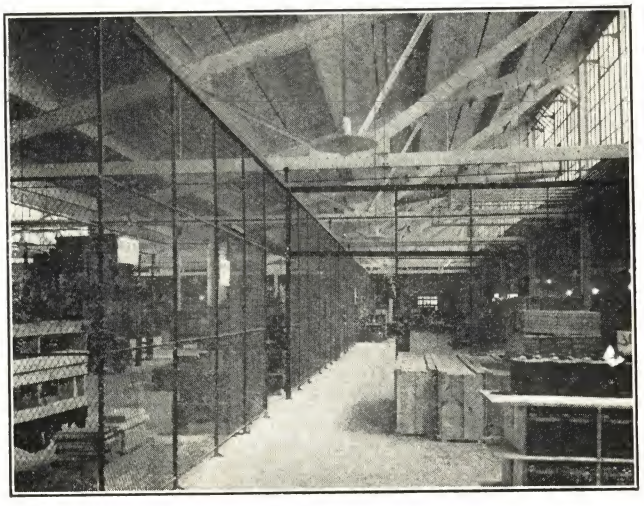
Furnish and install, where shown on drawings or called for in specification, standard woven wire partitions, built of standard sections (4 ft.) (5 ft.) wide by (7 ft.) (8 ft.) high and made of No. 10 (.135) W&M gauge wire woven into 1½-in. diamond mesh with 1x½x⅛-in. channel iron frames. Provide an additional top rail.

Door sections shall be interchangeable with other sections and shall be of widths called for on drawings. Sliding doors shall be hung with approved ball bearing hangers and furnished with (padlock) (cylinder) locks.

Swinging doors shall be hung with approved standard butt hinges and furnished with (padlock) (cylinder) lock.

Furnish and install service windows and shelves where shown and as detailed. All partitions shall be painted one shop coat.





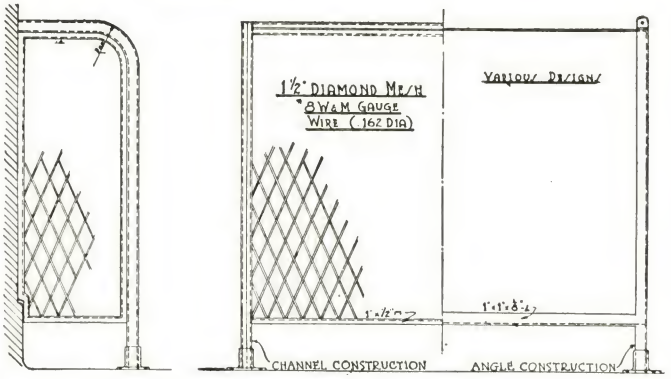
WOVEN WIRE RADIATOR GUARDS

Uses

This is the ideal radiator guard for asylums, hospitals and other institutions. Woven wire makes a rigid construction that will withstand continued abuse. Woven wire has no sharp edges or burrs and eliminates any chance of injury to patients.

Recommended Specification

Furnish and install removable woven wire radiator guards with curved tops, where shown on plans and as detailed, set in cast iron floor sockets and secured with setscrews. Floor sockets to be fastened to floor in approved manner. All guards shall be made of 1½-in. diamond mesh No. 8 (.162) W&M gauge wire set in 1x½x⅛-in. channel frames. Corner uprights shall have auxiliary channel to give post effect. (1-inch angle frames may be used. See illustration.) All guards shall be painted one shop coat.



Woven Wire Radiator Guard

WOVEN WIRE FOR CASHIER CAGES, BANK CAGES AND OFFICE PARTITIONS

Detail of Bronze Wire Bank Cages

Advantages

Woven wire is unquestionably the ideal construction for the above installations from the standpoint of appearance, ventilation and practicability. It is almost invariably used in modern bank cage designs. See following page for a few of many designs available. Two or more designs are also often used in combination and make an excellent appearance. Popular styles are No. 4 for upper section and No. 3 for lower section.

Uses

Woven wire is constantly used for office enclosures and bank cages where it is required to give security and privacy to employes handling monies, valuable gems, confidential papers and important documents. Its ease of application to special conditions and uses makes it the ideal material to use.

Recommended Specification

Cages shall be of a height to conform to front fixture and shall be made of *(see following page for design wanted)*. Framing shall be of 1x½x⅛-in. channels, tenoned and riveted at corners. Posts at doors and at each intersection shall be of 1½-in. square seamless steel tubing. Top rail shall be of same material.

Note: *If low type cages (as shown in illustration) are desired, show detailed construction.*

Finish all work prime coat of paint as selected.

WOVEN WIRE SKYLIGHT SCREENS

Uses

Double protection is afforded to skylights by the application of both exterior and interior woven wire guards. Many States stipulate their use as protection against falling objects outside and broken glass in case of fire inside. Where there is danger of falling icicles, No. 9 wire should be specified.

Recommended Specification

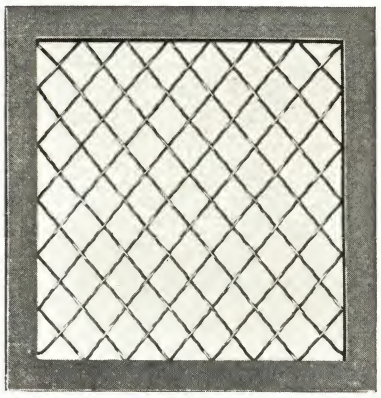
Furnish woven wire mesh skylight screens over and under all skylights where shown on drawings or as specified. Screens to be made of 1-in. diamond mesh No. 12 W&M gauge (.105) wire with ⅜-in. round rod frames and welded intermediate stiffeners. Screens to be easily removable and supported on rigid angle and tee-iron construction, as detailed, not less than 8 in. away from glass. All material to be painted shop coat of weatherproof paint.

Note: *Where it is unlikely that work will be painted at regular intervals, it is recommended that hot galvanizing or cadmium plating after fabrication be specified.*

Channel frames can also be used instead of round rod frames.

Typical Installation Double Pitch Skylight Screen

WOVEN WIRE DESIGNS FOR VENTILATOR AND RADIATOR GRILLES AND BANK CAGES

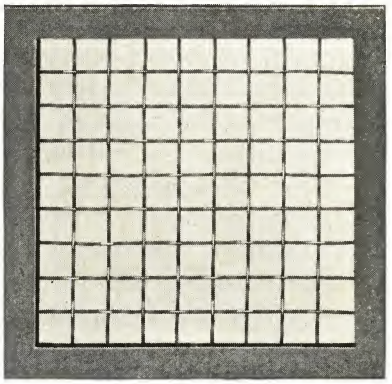


Grille No. 1

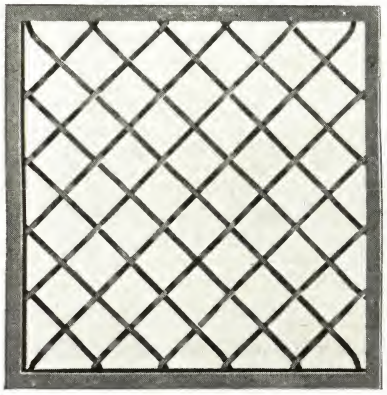
Many otherwise fine interiors have lost their entire architectural and structural character through the use of incorrect materials. It will be readily noted from the illustrations shown, that, under a wide variety of conditions and style of architecture, woven wire lends dignity and character not approached by any other material, and is adaptable to any style. Besides, it has the advantage that, regardless of the size of the opening, a uniform border is always maintained.

Nos. 1 and 2 Ventilator Grilles—Show diamond and square mesh respectively made of round wire with angle frames. This style is available in sizes as follows:

Mesh	¾-in.	1-in.	1¼-in.	1½-in.
Wire Gauge	14	12	11	10
Frame, inches	(angles 1 to 2; channels ¾ to 1½)			



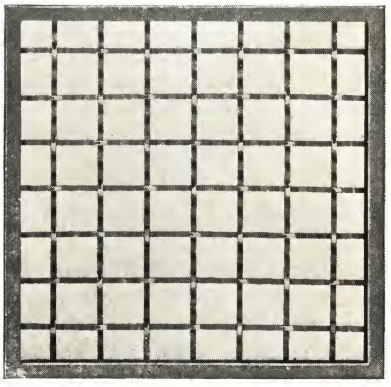
Grille No. 2



Grille No. 3

Nos. 3 and 4 Grilles—Ordinarily used for radiator grilles and bank cages. Show diamond and square mesh respectively. Made of flat wire with channel frames. This style is available in sizes as follows:

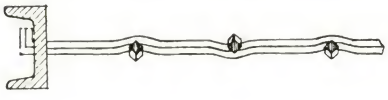
Mesh	¾-in.	1-in.	1¼-in.	1½-in.	2-in.
Flat wire	$\frac{3}{16}$	$\frac{3}{16}$ or ¼	¼ or $\frac{5}{16}$	$\frac{5}{16}$ or ⅜	⅜
Frames	(for grilles only), same as Nos. 1 and 2				



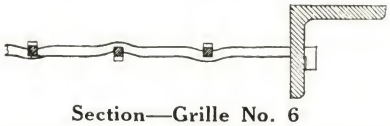
Grille No. 4

No. 5 Grille—Shows one of the many varieties of design possible with the use of woven wire. Illustration shows $\frac{3}{16}$ in. flat wire, double strand, square mesh. Other designs made to architects' detail.

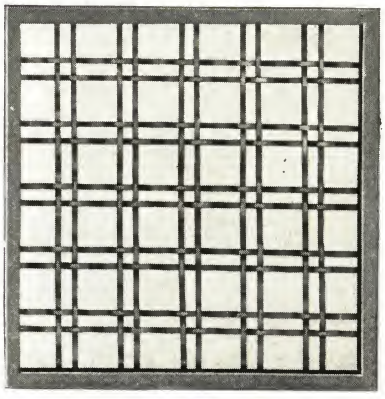
Nos. 6 and 7 Grilles—Show ⅛ in. square wire, 1½ in. square mesh, pressed crimp, set square, and set on diamond, respectively.



Section—Grille No. 7



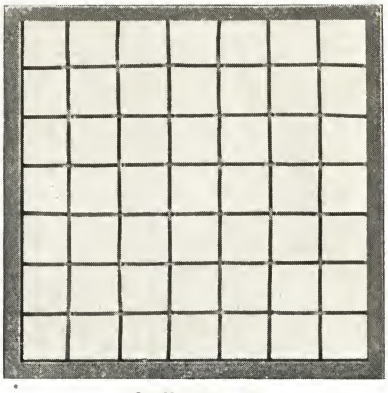
Section—Grille No. 6
Available as Shown with Angle or Channel Frame



Grille No. 5

Both these styles are popular in modern bank cage work.

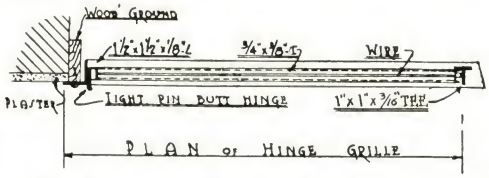
No. 8 Grille—Shows flat wire pressed crimp with channel frame.



Grille No. 6

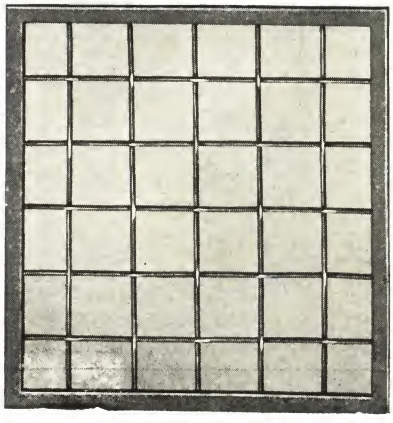
Important Note

Any of the above grilles can easily be made hinged for access by setting into an outer angle frame.

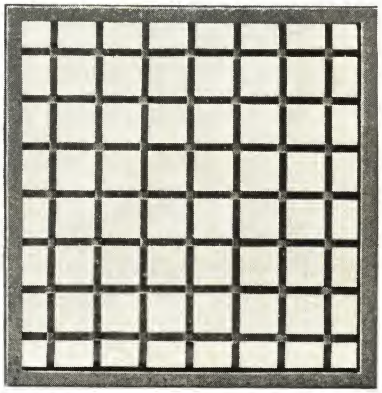


Woven wire work can also be supplied in allegheny metal, aluminum, brass, bronze, copper and monel metal, when materials are available.

Note: Woven wire is now available in ¼, ⅜ and ½ in. diamond mesh and is especially suitable for radiator grilles and screens.



Grille No. 7



Grille No. 8

WOVEN WIRE MESH WINDOW GUARDS

Uses

Woven wire mesh window guards have proven their ability to protect stores, churches, schools, homes and factories against thievery and breakage of glass and fire embers over a period of many years. When properly constructed they will last the life of the building.

Woven wire mesh is the standard for protection of gymnasium windows and lends itself readily to any style of window construction.

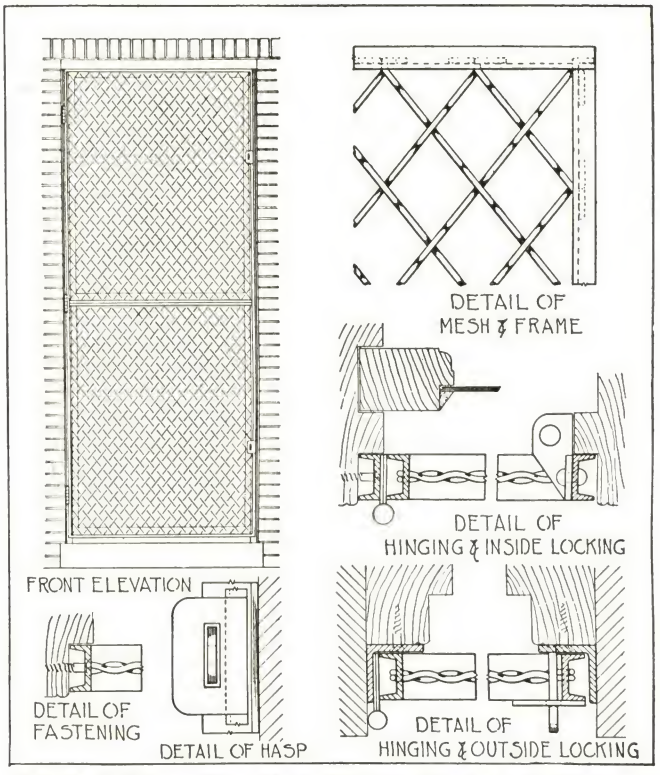
Illustrations on this page present application to a variety of conditions. Note ease of application to steel sash windows with pivoted ventilators.

Advantages

Woven Wire Window Guards are always made to fit the exact openings of windows and there is no waste of material as webs are not cut from stock sheets, but are woven up for each individual guard. Mesh openings can be decreased to suit special conditions as for Bird Screens for church windows. Thickness of wire can be increased where added protection is required as for exterior windows adjacent to school playgrounds.

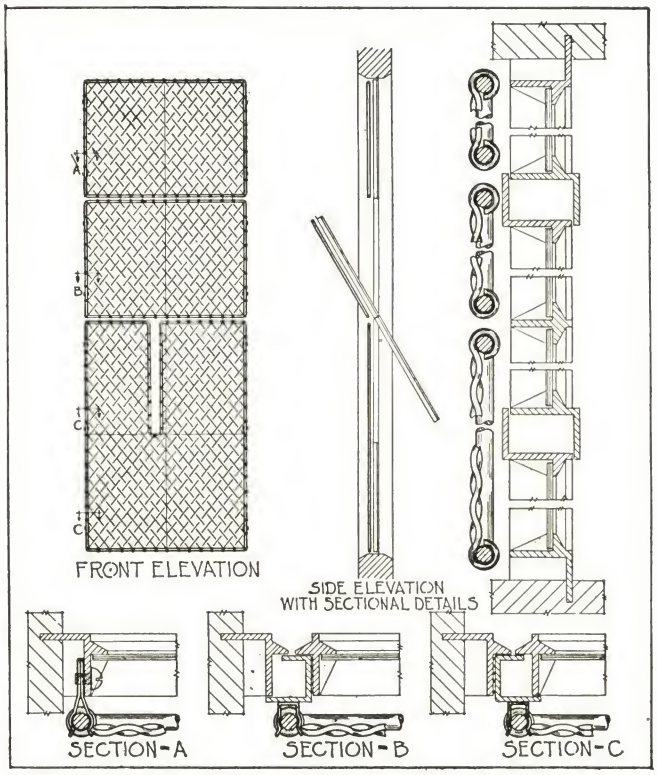
Recommended Specification

Furnish and install over all windows as shown on drawings Woven Wire Mesh Window Guards constructed of 1½-in. diamond mesh No. 10 W&M gauge (.135) wire with (⅜-in. round rod) (1-in. channel) frames, and intermediate stiffeners where required. Guards to be made to swing with suitable locking arrangement, and securely fastened, as detailed. All work to be painted one shop coat.



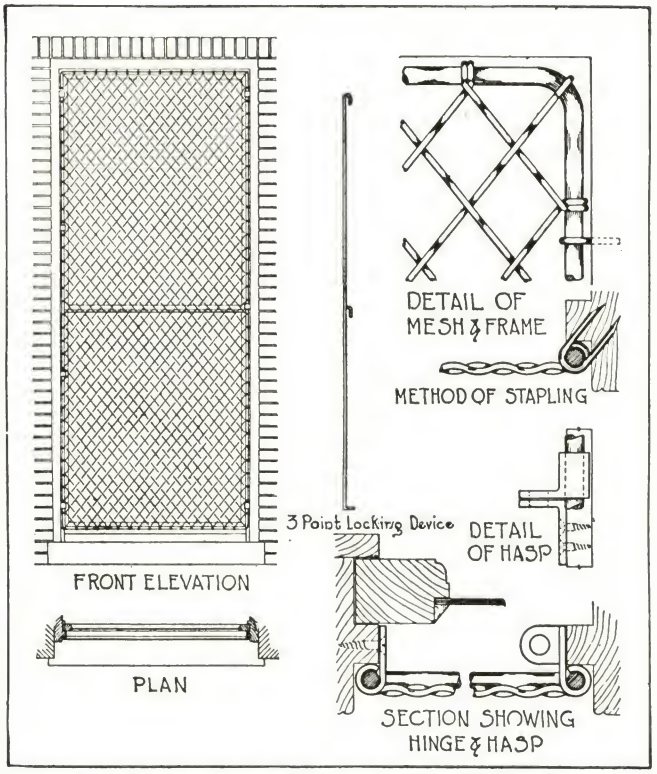
Details of Woven Wire Mesh Window Guards with Channel Iron Frame

Recommended for interior use in gymnasiums, etc., and for interior and exterior application to all double hung windows



Details of Removable Woven Wire Mesh Window Guards with Round Rod Frames

Applied to steel sash windows with pivoted ventilators by means of spring clips



Details of Woven Wire Mesh Window Guards with Round Rod Frames

Especially recommended for exterior use on windows

STANDARD MESHES AND WIRE

(As adopted by the National Association of Ornamental Iron & Bronze Manufacturers)

¾-in. mesh	No. 14 Wire	1¾-in. mesh	No. 9 Wire
1 -in. mesh	No. 12 Wire	2 -in. mesh	No. 8 Wire
1¼-in. mesh	No. 11 Wire	2¼-in. mesh	No. 7 Wire
1½-in. mesh	No. 10 Wire	2½-in. mesh	No. 6 Wire

GAUGE OF WIRE

(As adopted by the National Association of Ornamental Iron & Bronze Manufacturers)

Washburn and Moen Gauge

Illustrating Actual Size of Wire and Its Equivalent in Decimals and Fractions

Approx. fraction of inch	No. and size of wire	Decimals of inch
	No.	
¼	3	.2437
7/32	4	.2253
13/64	5	.2070
3/16	6	.1920
11/64	7	.1770

Approx. fraction of inch	No. and size of wire	Decimals of inch
5/32+	8	.1620
5/32—	9	.1483
9/64	10	.1350
⅛	11	.1205
7/64	12	.1055
3/32	13	.0915
5/64	14	.0800

SCHEDULE OF RECOMMENDED USES FOR VARIOUS MESHES AND FRAMES FOR WOVEN WIRE WORK

Wire and Mesh	Frame	Uses	Remarks
⅜-in. mesh No. 16 wire ½-in. mesh No. 15 wire Square or diamond	¼-in. round ½ or ⅝-in. channel ½x⅛-in. flat	Radiator screens and grilles	Can be supplied in copper, brass or bronze also
¾-in. mesh No. 14 wire Square or diamond	5/16-in. round or ¾-in. channel	Air intake screens Bird screens Church windows	Should be galvanized after fabrication or made of bronze
1-in. mesh No. 12 wire Square or diamond	⅜-in. round or 1-in. channel	Basement window guards Shelving Skylight screens Pipe railing screens	Diamond mesh for strength. Round frame for exterior
1¼-in. mesh No. 11 wire Square or diamond	⅜-in. round or 1-in. channel	Same as 1-in. mesh No. 12 Radiator guards	
1¼-in. mesh No. 8 wire Diamond	1¼-in. channel	Heavy duty partitions, as for tool cribs, elevator shafts, stock rooms	Ideal for factory use where trucking is done
1½-in. mesh No. 10 wire Diamond 2-in. mesh No. 8 wire	1-in. channels	Stockrooms Toolrooms Switchboards Transformers Elevator shafts Fire escapes Cashier cages Office partitions Corridors and Runways Stair enclosures Locker rooms Departmental divisions Basement storerooms Gymnasium window guards Lockers Elevator car tops and safety gates Radiator guards Porch grilles Shelves, etc.	1½-in. diamond mesh No. 10 gauge wire in 1-in. channel frames is standard construction and is especially recommended for economy, strength and appearance
1¾-in. mesh No. 9 wire Diamond	⅜-in. round 1-in. channel	Door and window guards	Usual specification for insurance protection
2¼-in. mesh No. 7 wire 2½-in. mesh No. 6 wire Diamond	7/16-in. round frames 1½-in. channel	Wire roof signs and fence Fences, porch screens	Should be galvanized after fabrication

ACORN WIRE AND IRON WORKS

Wire Mesh Enclosure Panels, Wire Cages, Wire Window Guards and Collapsible Folding Gates

TELEPHONE
Normal 1895

5906 Lowe Avenue
CHICAGO, ILL.

Products

Manufacturers of ACORN WIRE MESH ENCLOSURE PANELS; CAGES for Banks and Offices; DIAMOND MESH WINDOW GUARDS; COLLAPSIBLE FOLDING GATES; SANI-ROBE COAT and HAT RACKS.

Also manufacturers of Skylight Guards, Machinery Guards; Elevator Enclosures; Wire Signs; and Miscellaneous Wire Mesh Work.

Complete catalogue sent on request.

NO. 130 ACORN WIRE MESH ENCLOSURE PANELS

Description

There is a difference between Acorn Standard Mesh Enclosure Panels and just wire mesh partition.

It is always a problem when erecting partitions and enclosing various departments, to know what type of partition to select. Allowance must always be made for expansion and rearrangement of departments.

No. 130 Acorn Enclosure Panels are built in standardized units. Each section or door is a complete unit and is interchangeable with every other unit. Additional units to match may be ordered at any time. Installation may be relocated or rearranged at any time by unskilled labor.

Architects who definitely specify the type and quality of partitions desired will relieve their clients of the burden of purchasing them later, which, for want of knowledge, is usually done in a more or less promiscuous manner.

Construction and Specification Data—Architects may specify Acorn Standard Enclosure Panels by number, indicating type of doors and service windows desired.

Wire and Mesh—No. 10 (⅛ in.) steel wire, 1½-in. diamond mesh. Entire web in one piece with wires passing through center stiffening bar, eliminating unnecessary joints.

Framing and Stiffening Bar—Framing, 1x½-in. steel channel. Center stiffening bar, 1x⅜-in. steel channel securely riveted to frame.

Capping or Top Stiffening Bar—2x$\frac{9}{16}$-in. steel channel.

No. 130 Acorn Unit Wire Mesh Enclosure Panels

Height—7, 8, 9 and 10 ft. carried in stock; other heights to order.

Width of Panels—Standard panels are 5 ft. wide. Special width panels furnished to fill in where necessary.

Door Sections—Standard door sections are 3 ft., 3 ft. 6 in., and 4 ft. wide, and of height to match partition. Special widths when necessary. Doors are 6 ft. 6 in. high with transom panel overhead. Sliding doors up to 4 ft. wide, made self-closing without extra cost.

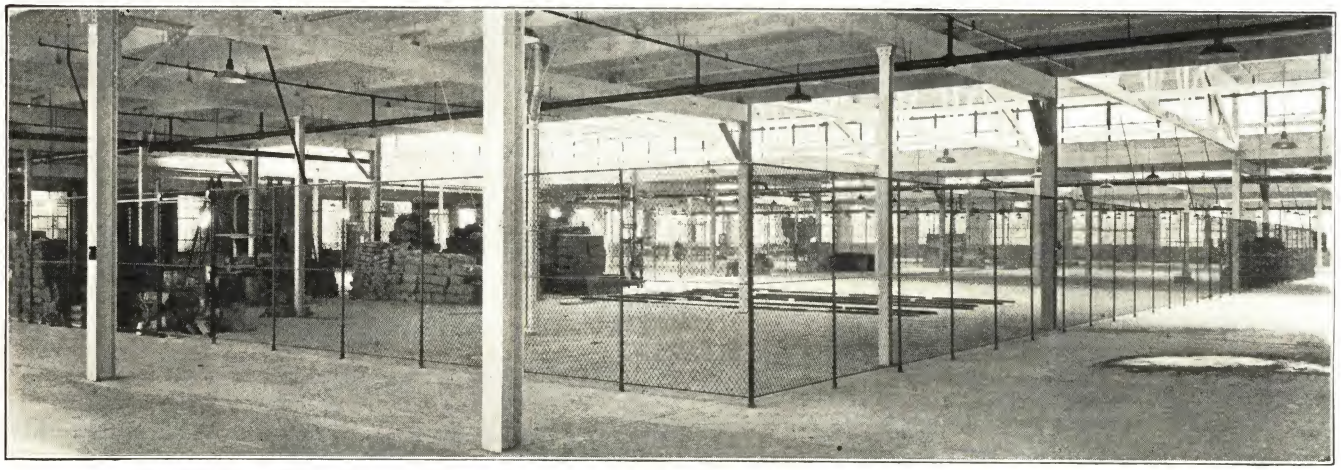
Locks—Heavy bronze locks, operated with cylinder from outside and recessed knob from inside. Masterkeyed locks furnished at slight additional cost. Doors equipped with hasp for padlock instead of regular lock with reduction in cost.

Combination Service Window and Shelf—Shelf swings up, closing opening and is locked from inside with improved dead locking push bolt. 2 sizes: 135A, 15 in. wide, 9 in. high; 135B, 24 in. wide, 15 in. high. Special service windows furnished to suit requirements.

Lift-up Service Windows—Fitted with catches that lock window in open and closed position. 2 sizes: 136A, 24 in. wide, 15 in. high; 136B, 24 in. wide, 21 in. high. Shelves can be furnished any width. Special sizes furnished where necessary.

Hangers—All sliding doors equipped with ball bearing hangers.

Floor Sockets—2½ in. high to allow for adjustment where floors are uneven.



No. 130 Acorn Wire Mesh Partitions in Unit Sections in Factory of the Silver-Marshall Company, Inc., of Chicago

When the company moved into their new factory, the pictured enclosure was all in place, ready to receive costly parts, tools, etc. This excellent demonstration of foresight prevented confusion, delays and possibility of loss

Corner Posts—1x1-in. steel angle with floor socket. This permits the making of corner at any intersection.

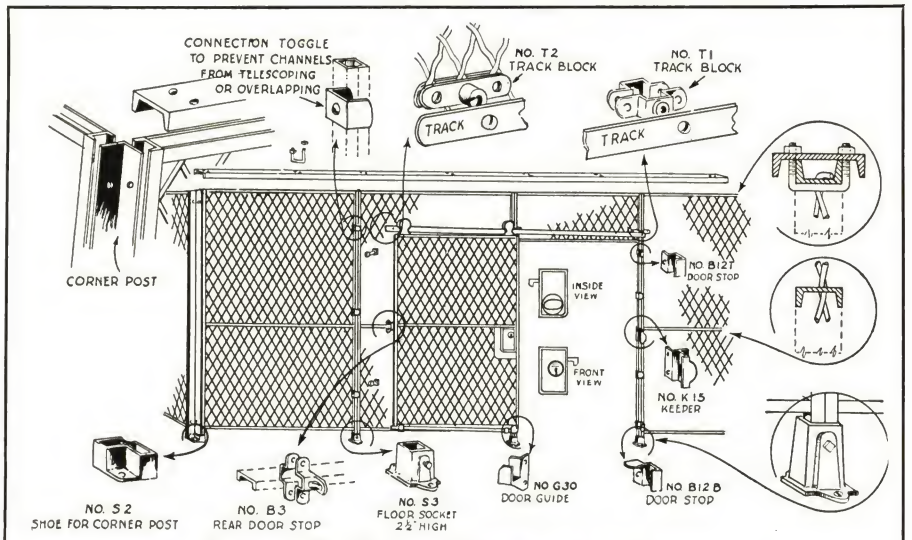
General Hardware—All hardware that is subject to strain is made of malleable iron or wrought steel to prevent breaking. The balance is made of soft gray iron.

Cut-outs and Special Panels—Cut-outs, or special size or shape panels furnished to meet special conditions.

Bracing—While capping or top stiffening bars will carry a reasonably long run of partition, simple methods of bracing can be easily arranged.

Paint—Standard factory green unless otherwise specified. Special colors may be had at slight additional cost.

Erection—Many original and exclusive features make Acorn Partitions extremely easy to erect. No experience or special skill is necessary. Diagram and complete setting instructions sent with each order.



Details of No. 130 Acorn Enclosure Panels and Doors

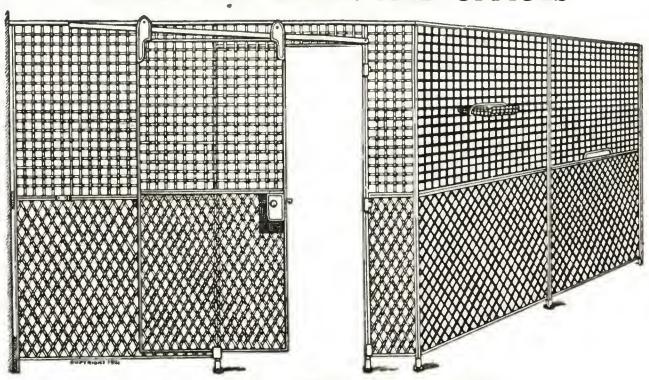
CAGES FOR BANKS AND OFFICES

Description—The Acorn Wire and Iron Works have developed and are using the press crimp type of construction in bank and office cages (see detail). This type of crimp adds much to the character and distinctiveness of the work. The old type double crimp can still be furnished when it is necessary to match old work.

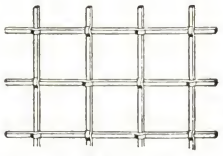
Press crimp can be furnished in either square or flat wire, but because of its greater utility and rigidity, square wire is recommended (see typical specification below).

No. 142 cage is commonly used in offices and small banks.

The upper part is made either of ⅛-in. square wire or ¼-in. flat wire, 1½-in. square mesh. The ⅛-in. square wire is preferable because of its greater strength. Wires are pressed at each intersection, making a neat and pleasing appearance.



Acorn Bank or Office Cage No. 142



Detail of Press Crimp Construction

The lower part is made of round wire, 1½-in. diamond mesh.

Doors furnished either sliding or swinging type, sliding doors being made self-closing unless otherwise specified. Doors fitted with cylinder locks operating with key from outside and knob from inside.

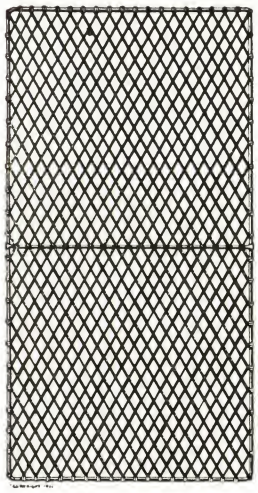
Other Designs—Cages can be furnished with ⅛-in. square wire or ¼x$\frac{1}{16}$-in. flat wire throughout.

When a better type of cage is desired it is recommended that 1¼-in. square seamless tubing be used at doors, corners and at each intersection; also at top of cage. (See design No. 144, Catalog No. 202, which will gladly be mailed on request.)

Other variations may be had by using steel panels or tubing at center line.

Pass Baskets are usually 8 in. wide, 10 in. long and 3 in. deep.

WINDOW GUARDS



No. 121 Window Guard

Acorn Wire Mesh Window Guards

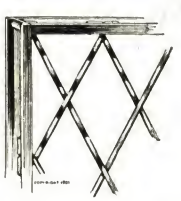
They protect glass against breakage and prevent entrance by stealth. They also prevent dishonest employees from passing valuable tools, etc., through the windows to confederates outside. They permit the windows to be opened for ventilation with safety. Send for catalogue.

Material Specifications—Made of three principal specifications: 1¼-in. mesh, No. 12 wire; 1½-in. mesh, No. 10 wire, and 2-in. mesh, No. 8 wire. No. 10 wire, 1½-in. mesh is most used, being the meeting point between burglary and glass protection. Guards can be furnished in any wire desired.

H-5 hinges and H-6 hasps, of malleable iron, are recommended. They afford an excellent means of fastening and are adaptable to any style window frame by reversing same where necessary. Hinges are fastened to window by lag screws making it difficult to remove from outside. Hasps are locked to a heavy screw-eye which can not be removed when padlock is in place.

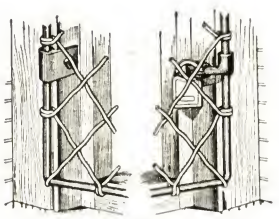
Methods of Installing—Where guards are used principally for burglar protection, hinged Type "A" is recommended. The hinges are fastened to window frame by means of lag screws, making it difficult to remove from outside.

When burglar protection is not an important factor, and when it is desirable to attach the guards from outside, hinged Type "B" is recommended. In this case the lag screws are exposed to the outside.

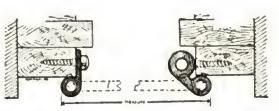


No. 122 Window Guard

Channel frame varying from ¾ to 1 in. wide. These are satisfactory when designed to fit into opening, but are not recommended when outer grooved edge is exposed to view



H5 Hinge
H6 Hasp



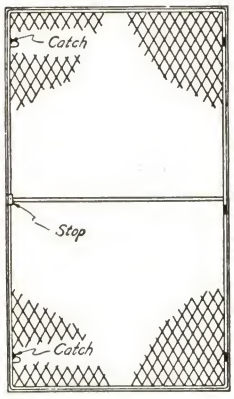
No. 121 Window Guard Hinged, Type A

Round steel frame of $\frac{5}{16}$ or ⅜-in. diameter according to size of guard. Also made in stationary type

GYMNASIUM WINDOW GUARDS

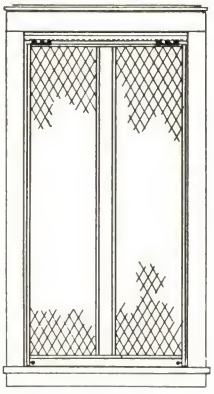
While the several types of gymnasium window guards shown are recommended because of their simplicity in operation, many other types can be furnished when desired.

Send for catalogue if interested.



No. 121-2

Carries ⅜-in. round rod frame. *See details below.* These guards have won favor with gymnasium directors because of their utility and efficiency. They are easily operated and fitted with self-locking fasteners. Quotations gladly furnished on request



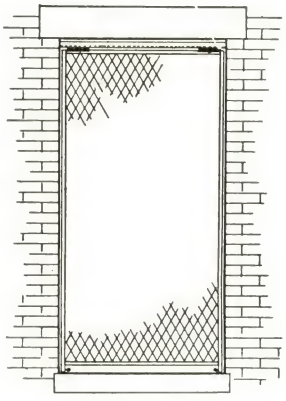
No. 127

No. 127—Carrying channel frame and is hinged at top with slot for window pole and suitable catches at bottom. This arrangement is very desirable because windows may be opened without swinging guard

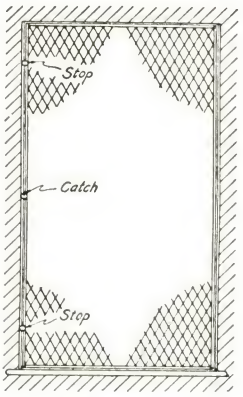
No. 128—Hinged at top and suitable catches at bottom. Windows readily accessible for opening or washing

Note

No. 10 wire, 1½-in. diamond mesh is recommended for gymnasium window guards. Finished in green or black enamel. Specify by number and state whether fastened to brick or wood



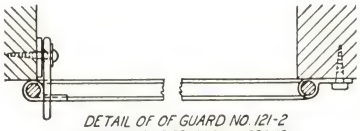
No. 128

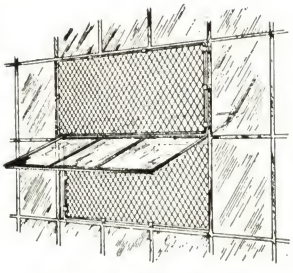


No. 122-6

Carries 1-in. channel frame. No. 122-6 Guard is recommended because of its greater rigidity but, where an inexpensive guard is required, the No. 121-2 will be found thoroughly satisfactory.

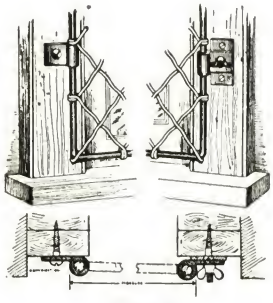
Quotations gladly furnished on request





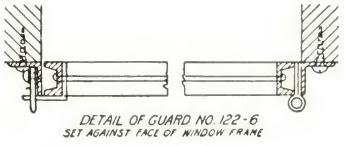
Type No. 126, Fig. B

Type No. 126, Fig. B—An excellent arrangement for guarding pivot sash windows. Where protection against entrance is desired, the guard for the upper opening is placed on outside and guard for lower on inside.



Type K

Type K—A very popular method of fastening on inside of windows. Usually H-5 hinges are screwed to the window frame on one side, and held in place with "K" fittings on the other, permitting guard to swing for cleaning windows, etc.



COLLAPSIBLE FOLDING GATES FOR EVERY PURPOSE

Collapsible folding gates serve many purposes. They afford excellent protection without interfering with light or air. Every type of industrial, commercial or public building has a use for them.

The four designs *shown at the left* are most commonly used and will meet every requirement.

Acorn Collapsible Folding Gates are usually made of ¾ x ⅜-in. open hearth steel channels and, unless ordered to the contrary, are finished in black enamel. When required gates can be furnished in bronze, aluminum, white metal or any other non-ferrous metal.

Any type of gate can be furnished in any of the arrangements shown and when writing for prices, state design of gate, also the figure number to show the arrangement desired.

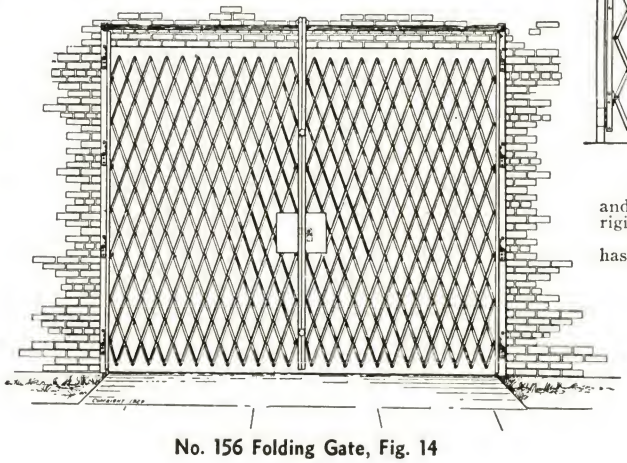
Quotations gladly furnished on request.

No. 156

No. 156A

No. 157

No. 157A



No. 156 Folding Gate, Fig. 14

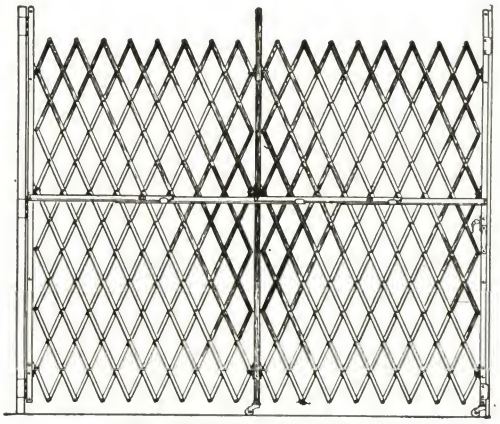
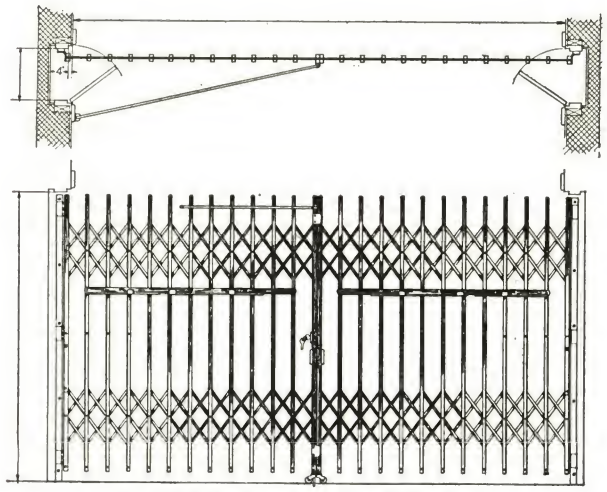


Fig. 156 Folding Gate, Fig. 15

A single type gate with vertical reinforcing post and jack-knife brace. This gate is recommended where rigidity and ease of operation are essential.

Specify by number—*156, Fig. 15,* and state whether hasp or cylinder lock is required

No. 156, Fig. 14 *shown at the left* is an excellent arrangement where gates are required to withstand considerable resistance. By notching the track overhead, gates may be swung around, out of the way, when not in use. May be used with safety where doors are required to remain open overnight. Specify by number *—156, Fig. 14* and state whether hasp of cylinder lock is wanted.

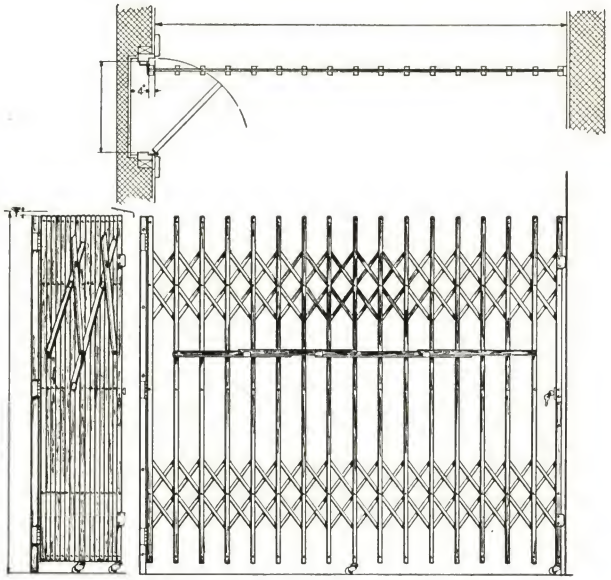


No. 157 Folding Gate, Fig. 16 Double Type

All school boards are now giving serious thought to closing off corridors to prevent the free run of school buildings while the auditorium is in use.

The above is an excellent arrangement which permits the folding of gates into a cabinet when not in use. Can be used without cabinet when necessary. Either Type No. 156 or No. 157 can be used in this arrangement.

If this type is desired, specify by number—*157, Fig. 16,* and state whether hasp or cylinder lock is required

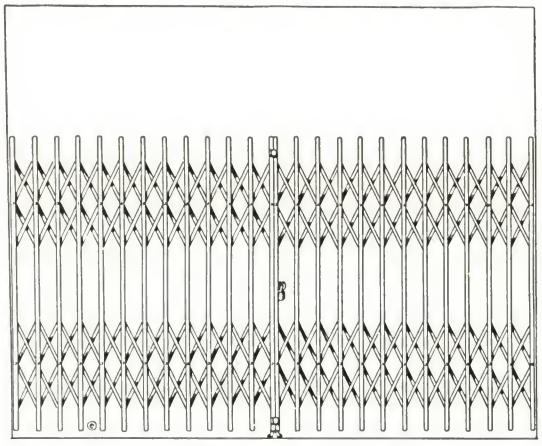


No. 157 Folding Gate, Fig. 18 Single Type

Showing popular arrangement used extensively for closing off corridors in schools. It is rigid, easily operated, and when not in use, is folded inconspicuously out of the way.

Cabinets are usually built about 4 in. deep. Width of cabinet will be furnished upon receipt of measurements showing width of corridor. This view shows open and closed position of gate with jack-knife brace.

Specify by number—*157, Fig. 18,* and state whether hasp or cylinder lock is required



No. 157 Folding Gate Fig. 11

Left:

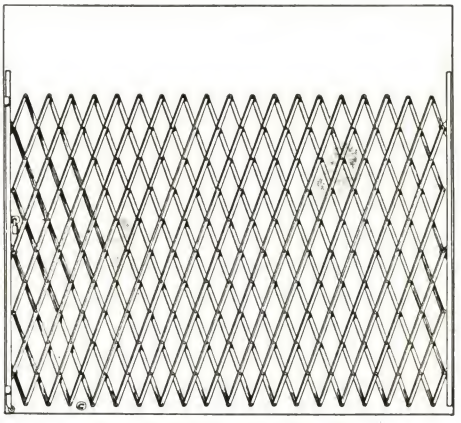
No. 157 Folding Gate, Fig. 11 may be used in corridors of schools, banks, office buildings, or public institutions. Can be used with or without cabinet.

Ordinarily, rigidity is not entirely necessary and, therefore, a track is not essential but whenever it is to withstand abuse, an overhead track or brace should be included.

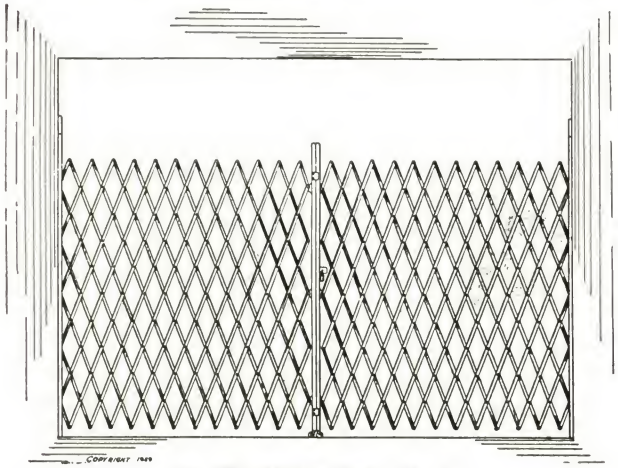
Specify by number — *157, Fig. 11,* and state whether hasp or cylinder lock is required

Right:

No. 156 Fold Gate, Fig. 10 is frequently used for large doors of factory buildings, warehouses, garages, display windows or anywhere requiring protection without shutting off light or air. Specify by number—*156, Fig. 10,* and state whether hasp or cylinder lock is wanted



No. 156 Folding Gate Fig. 10



No. 156 Folding Gate, Fig. 17

This type is frequently used for schools, factory buildings, warehouses, garages, display windows, or anywhere requiring protection without shutting off light or air.

Specify by number—*156, Fig. 17,* and state whether hasp or cylinder lock is required

Indestructo Lock

(Patent applied for)

The Acorn Indestructo Folding Gate Lock is an added safety feature which can now be obtained with Acorn Collapsible Folding Gates. It does away with the necessity of a padlock, eliminating the last undesirable feature. This lock is safe, practical and economical. It is accessible by key from either side and is unbreakable

BADGER WIRE & IRON WORKS

2930 West Cleveland Avenue
MILWAUKEE, WIS.

Above:
Ornamental Metal Entrance and Lanterns, Also Series of Six Store Fronts, Lowry Medical Arts Building, St. Paul, Minn.
CLARENCE H. JOHNSTON, Architect
F. J. ROMER CONSTRUCTION CO., Contractors

Products

ORNAMENTAL IRON, BRONZE & WIRE WORK, including Store Fronts, Stairs, Entrances, Elevator Enclosures, Bronze Tablets, Fire Escapes, Grilles, Balcony Railings, Gratings, Sidewalk Doors, Marquises, Fences, Gates, Flagpoles, Folding Gates, Wire Window Guards, Partitions, Railings, Toolroom Enclosures, Wire Signs, Skylight Guards.

References

Among recent installations are the following:

North Western Mutual Life Insurance Company Building, Milwaukee, Wis., Holabird & Root, Architects; W. W. Oeflein, Inc., Contractors.

Lowry Medical Arts Building, St. Paul, Minn., Clarence H. Johnston, Architect; F. J. Romer Construction Co., Contractors.

Warner Theatre and Office Building, Milwaukee, Wis., Rapp & Rapp, Architects; Geo. A. Fuller Co., Contractors.

Mechanical Engineering Building, Madison, Wis., Arthur Peabody, State Architect; J. H. Findorff & Son, Contractors.

State Office Building, Madison, Wis., Arthur Peabody, State Architect; J. H. Findorff & Son, Contractors.

Washington Hospital, Washington, Pa., R. E. Schmidt, Garden & Erikson, Architects; Hutter Construction Co., Contractors.

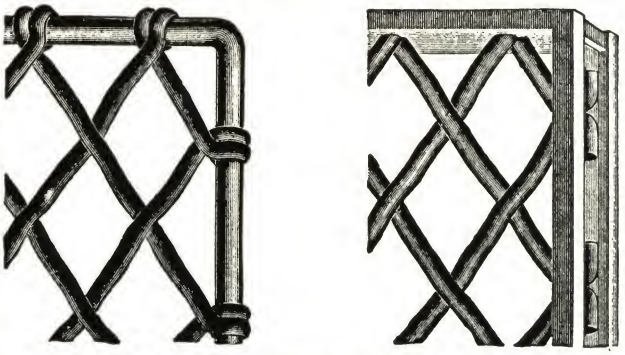
Right:
Ornamental Stair Railing and Steel Substructure for Stair Main Lobby, Warner Theatre Building, Milwaukee, Wis.
RAPP & RAPP, Architects
GEO. A. FULLER CO., Contractors

Steel Stair and Railing, Berger Furniture Company Building, Milwaukee, Wis.
KIRCHHOFF & ROSE, Architects
FOSTER CONSTRUCTION CO., Contractors

Bronze Lamp Standard, Wisconsin General Hospital, Madison, Wis.
ARTHUR PEABODY, State Architect
IMMEL CONSTRUCTION CO., Contractors

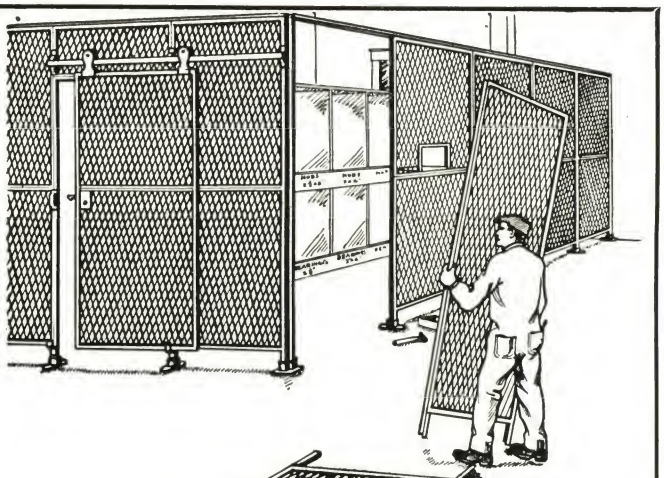
Wrought Iron Railings and Lamps, Robe Bird Residence, Milwaukee, Wis.
AUG. BOEHNKE, Architect

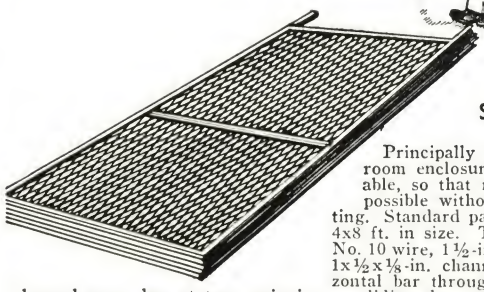
Steel Doors and Grille, Prange Residence, Sheboygan, Wis.
W. C. WEEKS, Architect



Wire Window Guards

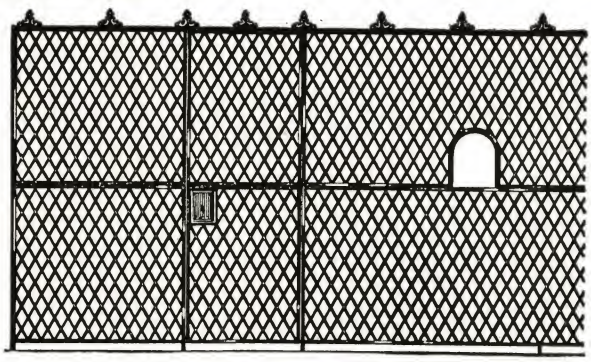
A particular specialty is made of the manufacture of wire window guards and these can be furnished at minimum prices. Inquiries should specify quantities and sizes, as well as gauge of wire, size of mesh and style of frame





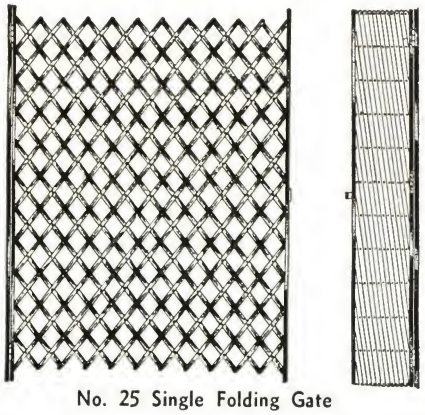
Standard Sectional Wire Partitions

Principally for tool and stock room enclosures. Interchangeable, so that re-arrangement is possible without drilling or fitting. Standard partitions are made 4x8 ft. in size. They are made of No. 10 wire, 1½-in. diamond mesh, 1x½x⅛-in. channel frames, horizontal bar through center, 1½-in. channel cover bar at top; swinging or sliding doors; also service windows, equipped with necessary hardware

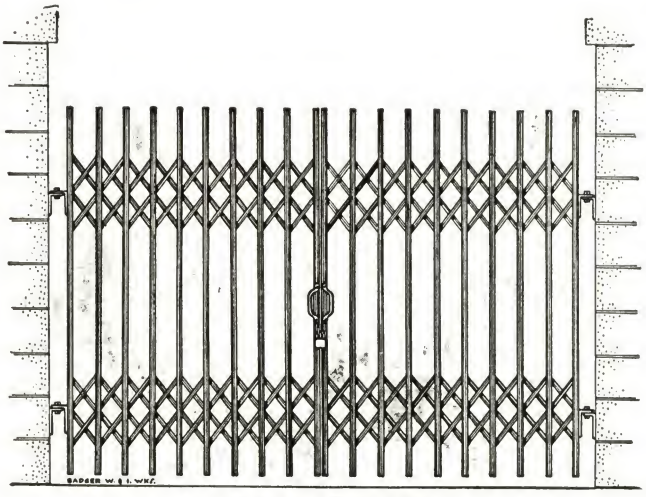


Wire Partition

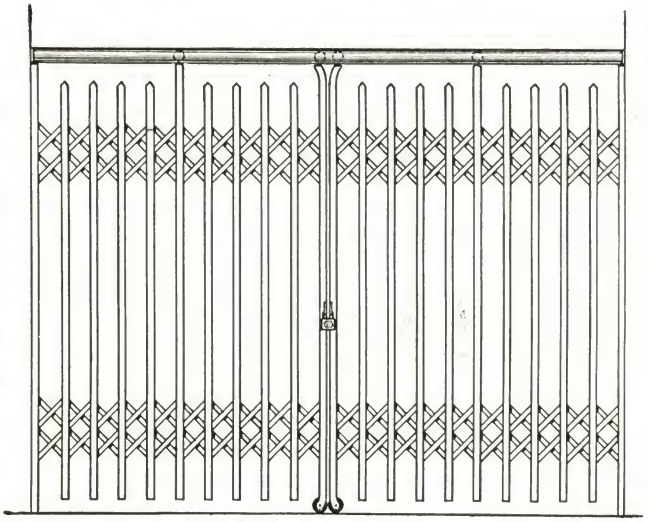
Iron Gate and Fence



No. 25 Single Folding Gate



No. 27 Double Folding Gate



No. 28 Double Folding Gate with Overhead Track

EXAMPLES OF BADGER WIRE AND IRON WORK

THE CONSOLIDATED EXPANDED METAL COMPANIES

Steelcrete Diamond Mesh Window Guards and Partitions

Steelcrete Building, WHEELING, W. VA.

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FOREIGN SALES OFFICE, 152 West 42nd Street, NEW YORK, N. Y.

For Steelcrete Concrete Reinforcing Mesh and Steelcrete Bank Vaults, see Manufacturers' Index

Manufacture and Erection of finished Steelcrete Guards and Partitions is handled by responsible Steelcrete Shops in:

ARKANSAS
Little Rock
ALABAMA
Birmingham
Ensley
CALIFORNIA
Oakland
Petaluma
Sacramento
San Francisco
CONNECTICUT
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Hartford
Waterbury
GEORGIA
Atlanta
HAWAIIAN ISLANDS
Honolulu
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Richmond
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VENEZUELA
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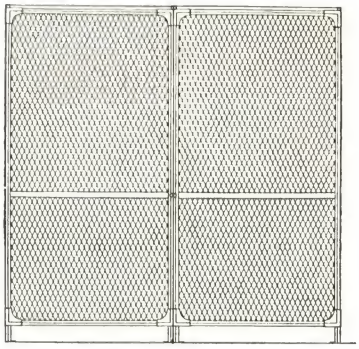
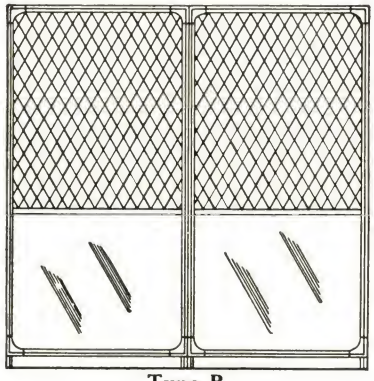
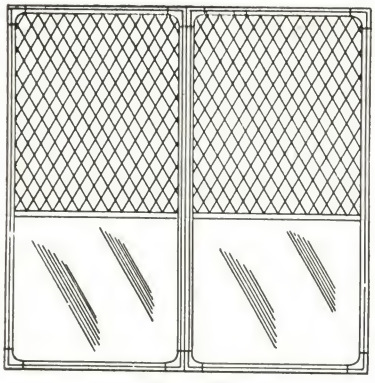


Type A



Type B



Type D

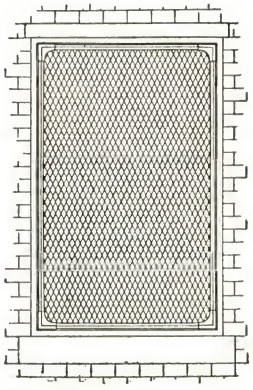
Steelcrete

Partitions

Architects specializing in apartment building construction will be interested in the basement storage enclosures which can be fabricated and erected using Steelcrete Mesh framed with partition bar, at low cost. These enclosures allow a free passage of air and light and are strictly modern in every respect. In industrial plants Steelcrete open mesh tool and stock room enclosures provide visibility as well as security.

Window Guards

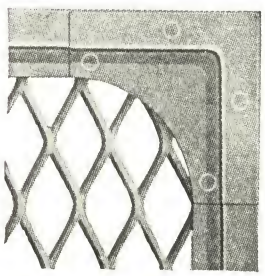
Attractive window guards are fabricated using Steelcrete Mesh and Frame Bar. The mesh is secured in the bulb shaped bar and the corner pieces riveted in place, making a finished panel of unusual strength. Accessories include hinges, clips and every necessary part for a well constructed guard properly erected in the building.



Window Guard

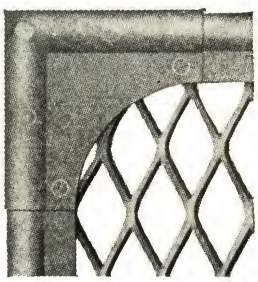
Specifications for Diamond Mesh Partitions—Open mesh partitions, where specified, shall be constructed using Steelcrete Mesh and Partition Bar, as manufactured by THE CONSOLIDATED EXPANDED METAL COMPANIES, Wheeling, West Virginia, and all connections, corners and attachments shall be made in accordance with manufacturer's recommended details.

Size and type of mesh: (¾-in. No. 13 or 1½-in. No. 10). Partitions to be: (Painted or galvanized).



Corner Assembly of the Steelcrete Industrial Mesh and Steelcrete Partition Bar and Corner

Specifications for Window Guards—Protective guards where specified shall be of the Steelcrete Frame Bar type as manufactured by THE CONSOLIDATED EXPANDED METAL COMPANIES, Wheeling, West Virginia; hinged, hung or fastened as per detail, type No. .., Mesh Style No. ... Details to be submitted to the architect for approval. Guards shall be galvanized or painted.



Corner Assembly of Steelcrete Industrial Mesh and Steelcrete Frame Bar and Corner

Booklets

Steelcrete Partition and Window Guard Catalogue No. 127. Complete information including illustrations, details and specifications for window and door guards and partitions. Let us put you in touch with the Steelcrete Shop in or near your city.

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Fabricators and Erectors of Architectural Iron and Wire Work

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Manufacturers of Ornamental Iron Work, Wire Mesh Work, Builders' Iron, including:

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Railings, Gates, Grilles, etc., in Antique, Swedish, and Rustproof Finishes.

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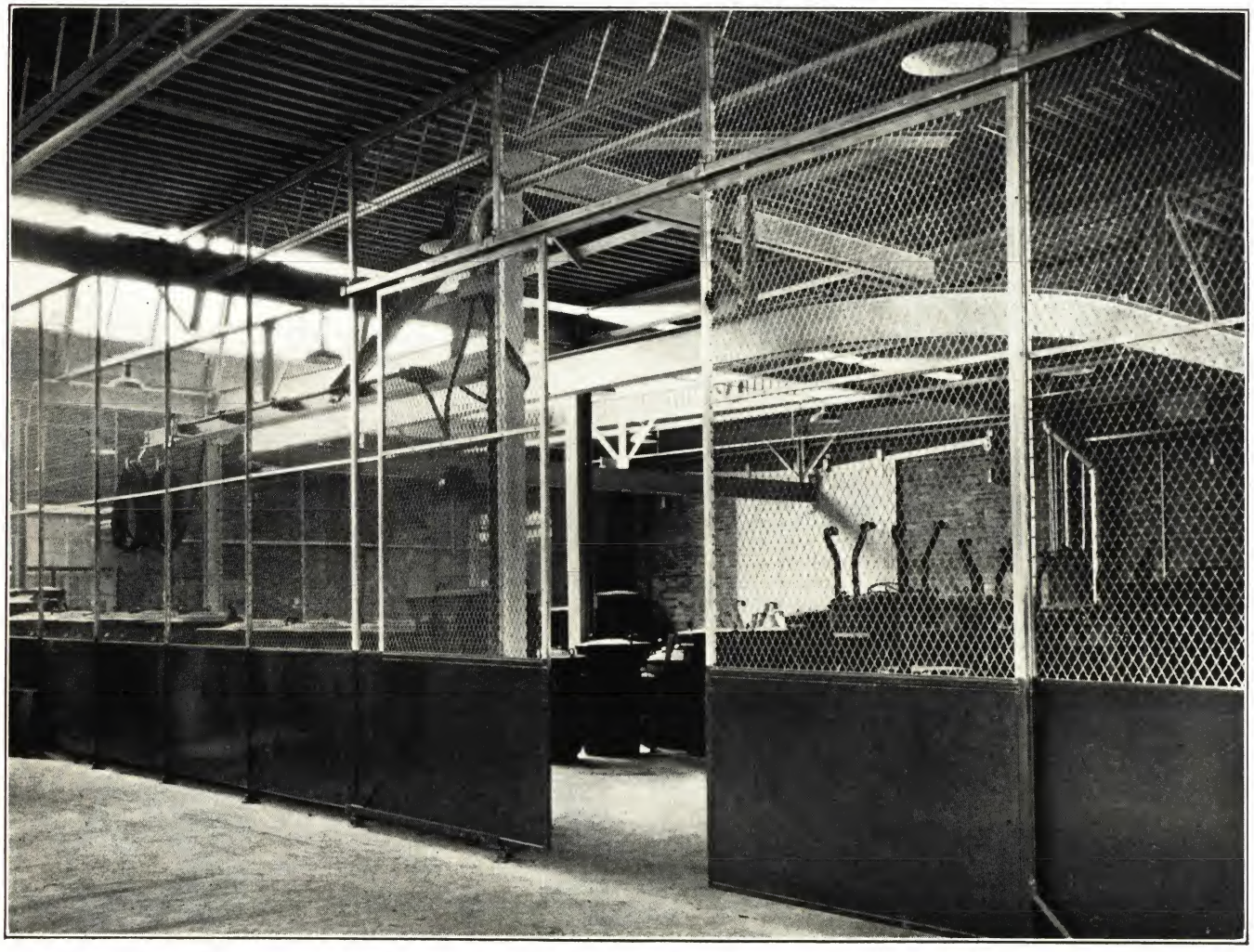
Complete departments for Designing, Draughting and Estimating are at the service of architects, for all of our products. Details, specifications and estimates will be gladly furnished on request.

Facilities

Our plant is one of the best equipped in this section, and contains all the most modern types of machinery and tools, and enables this organization to meet promptly and efficiently all demands for its products.

A FEW TYPICAL INSTALLATIONS OF MISCELLANEOUS IRON AND WIRE WORK

Project	Architect
Substation, Adams and Tabor Avenues, Philadelphia, Pa. (Philadelphia Electric Co.)	John T. Windrim
Freight Station, 32nd and Chestnut Streets, Philadelphia, Pa. (Pennsylvania R. R.)	United Engineers and Constructors, Inc.
Passenger Station, Jenkintown, Pa. (Reading Co.)	Horace Trumbauer
Heating Plant, 30th and Race Streets, Philadelphia, Pa. (Pennsylvania R. R.)	United Engineers, Inc.
St. Augustine's R. C. Church, Ocean City, N. J.	Emile G. Perrot
St. Ann's Auditorium, Wildwood, N. J.	Emile G. Perrot
Power Plant, 7th and Filbert Streets, Philadelphia, Pa. (Lit Brothers)	Simon & Simon
Grade School Building, Delaware City, Del. (Delaware Foundation)	Guilbert & Bettele
Industrial School, Bordentown, N. J.	Guilbert & Bettele
Treatment Building, N. J. State Village, Skillman, N. J. (State of New Jersey)	Dept. of Architecture
Occupational Therapy Building, Greystone Park, N. J. (State of New Jersey)	Dept. of Architecture
St. Matthew's Parochial School, Conshohocken, Pa.	Geo. I. Lovatt



"Standard" Mesh and Sheet Metal Partition, Philadelphia Electric Co., Philadelphia, Pa.

OLNEY J. DEAN & CO.

Manufacturers of Scuppers and Concrete Inserts

The Builders Building—Wacker Drive at La Salle

CHICAGO, ILL.

TELEPHONE
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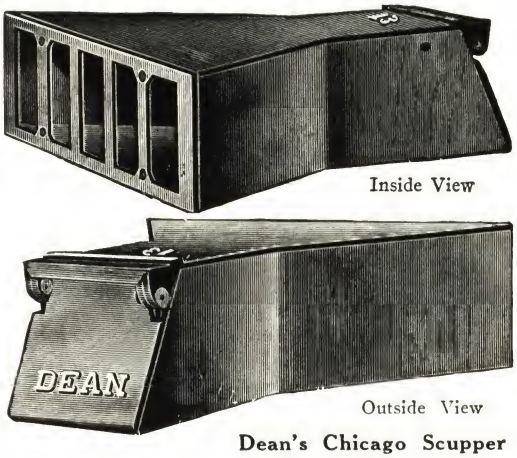
DEAN'S CHICAGO SCUPPERS

Advantages—Windproof and rainproof, designed to meet the requirements of the National Board of Fire Underwriters. Reduce insurance rates 3 to 5 per cent. Initial cost low in comparison to this annual saving. Reduce water losses and interruption to business in case of fire by draining the water directly to the outside of the building. Protect goods on the floor in case of breaks in water or sprinkler system. Protect wood floors from standing water.

Therefore use scuppers in every building.



Inside View

Outside View

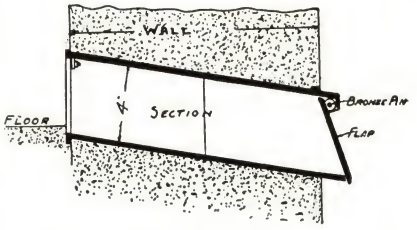
Dean's Chicago Scupper

Construction—Our Chicago scupper has 48-sq. in. capacity at the inlet and 16-sq. in. capacity at the outlet.

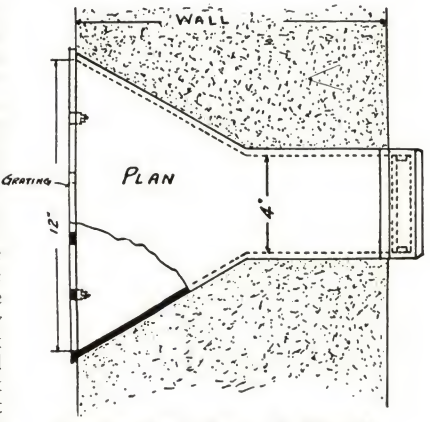
Its large tapered inlet increases the water carrying capacity of the scupper. The outside flap is hung on bronze pins and balanced at such an angle that its weight holds it snug against the walls of the scupper, making it watertight and windtight, although a very small flow of water from within will open it. The hinges and valve are covered and protected from clogging with mortar, dirt, or ice by a shelf projecting from the outside of the scupper. The removable grating on its inside face, which is flush with the wall, prevents clogging from the inside of the building and allows a clear inspection of the interior of the scupper at all times.

Check Valve—While the careful fitting of the outer flap makes the Chicago scupper windproof, we can, if desired, insert an additional check valve in the box.

Installation—The National Fire Protection Association recommends under ordinary conditions, one scupper having an outlet area of 16 sq. in. to every 1000 sq. ft. of floor, or, in a building equipped with a sprinkler system, one to every 500 sq. ft. of floor. The Dean Chicago Type Scupper complies fully with this recommendation.



Specification—The mason contractor shall furnish and set one Dean Chicago Type Scupper in each bay of the exterior wall as shown on plans. The scuppers shall comply with the recommendations of the National Board of Fire Underwriters, having well fitted and non-clogging outside flaps hung on bronze pins and removable inside gratings. They shall have inlets at least 12 in. wide and outlet areas of at least 16 sq. in. Care must be taken in setting the scuppers to see that the pitch is not less than 2 in. in 12 in., that the lower inside edges of scuppers are set 1 in. below finished floor line, and that scuppers are set true to wall lines and are not sprung or broken during construction work.



Section and Plan of Dean's Chicago Scupper

On completion of the job, flaps must be cleaned and left in perfect working order and all exposed parts of scuppers are to be cleaned and given a heavy coat of paint.

DEAN'S CONCRETE INSERTS—SLOTTED AND THREADED

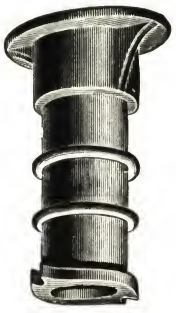
Slotted or Adjustable

Uses—*Slotted Inserts*—The only substantial means of supporting machinery, shafting, overhead trolleys, and sprinkler systems on the floors, columns, walls or ceilings of concrete structures.

Threaded Inserts—Recommended for the suspension of piping and securing of trim, sash and doors where great loads will not be experienced and a perfect alignment is not required.

Special Inserts — We are equipped to make up continuous inserts or other special types at short notice. Our $\frac{5}{16}$-in. threaded insert is well adapted for use in installing insulating materials or metal lath.

Material—Dean Inserts are made of high grade malleable iron.



Threaded

Installation—Inserts are fastened to the form of the slab, beam or column by driving nails through the notched lugs on either side. They are thus held securely in position while the concrete is poured.

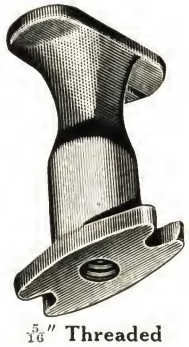
When the forms are removed, the slotted face of the insert is exposed flush with the concrete.

DEAN'S CONCRETE INSERTS

The following sizes are stocked in Chicago warehouse for immediate shipment

Size bolt, in.	Allowable load, lb.	Height out to out, in.	Shipping wt. per 100, lb.
Slotted or Adjustable Inserts			
$\frac{3}{8}$	800	2	30
$\frac{1}{2}$	1500	$2\frac{1}{2}$	47.5
$\frac{5}{8}$	2400	$3\frac{1}{2}$	84
$\frac{3}{4}$	3600	$4\frac{1}{4}$	130
$\frac{7}{8}$	5000	$4\frac{1}{4}$	190
Threaded Inserts			
$\frac{5}{8}$	1200	$3\frac{3}{8}$	75
$\frac{3}{4}$	1800	$3\frac{3}{8}$	75

We are also prepared to manufacture, on short notice, special inserts to fill unusual requirements.



$\frac{5}{16}$" **Threaded**

WATERTITE DRAIN & SCUPPER CO., INC.

Windproof Hooded Scuppers

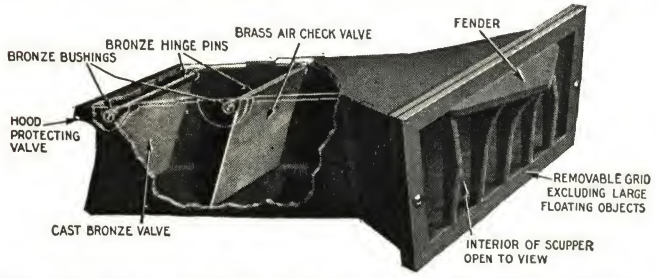
229 East 37th Street, NEW YORK, N. Y.

AGENTS IN MANY CITIES

Purpose of Scuppers

It is a well-known fact that water damage often exceeds the fire damage and also causes large losses through disruption of business. A small fire on an upper floor may cause enormous damage to goods, machinery, etc., by flooding the floors below. Scuppers allow this water to escape outside the building and save this enormous and unnecessary loss.

Underwriters recommend the use of scuppers (especially in sprinklered buildings) and the insurance rate for both owner and tenants is favorably affected by their use.



Type R Windproof Hooded Scupper with Double Air Check, Removable Grid and Fender

Underwriters' Approval Is Your Guarantee

Our scuppers have been tested, approved and listed as standard by the Chicago Laboratories of the National Board of Fire Underwriters. This secures their acceptance by all local exchanges and the maximum allowance in the rate.

The Factory Mutual Laboratories have also approved our scupper when provided with a large hood enclosing the valve on the three sides ("complete hood").

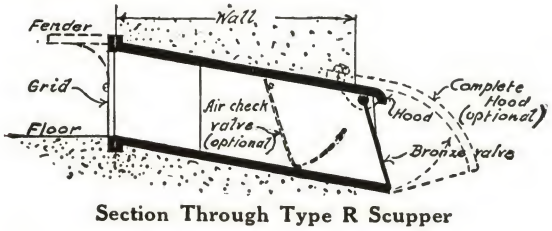
Construction of Type R Scupper

Windproof Valve—Box of cast iron, outlet 4x4 in., inlet 12 in. wide. To exclude cold air, a heavy cast bronze valve is hung in bronze bushings overlapping the outer end of the scupper.

The locating of the valve in this manner provides for its free action, which cannot be expected from a valve recessed in the scupper mouth subject to clogging by incrustations of dirt or sealing by ice or sleet. As the scupper is an emergency device it must be ready to function always, else it is useless.

The inner air check valve is not a necessity, as our outer valve is well fitted and effectively excludes cold air.

Hood—A small hood protects the valve from being clogged by mortar during construction, and from dirt and ice. If desired, we can furnish the "complete hood," enclosing the valve on three sides. This form is favored by New England Underwriters, as giving greater protection to the valve.



Section Through Type R Scupper

Grid—The grid protecting the inlet is removable, being secured by two brass setscrews.

Fender—The fender projecting 1½ in. into the room is designed to prevent storing goods against the inlet of the scupper. Fender can be omitted, if desired.

Pitch—Our scupper has a downward pitch of 2 in. to the foot, providing a good head of water to open the valve.

Discharge Capacity—Tests made by Underwriters' Laboratories developed that our scupper will discharge 60 gallons per minute under 1-in. head of water on the floor and 100 gallons per minute under 3-in. head.

Necessity of Bronze Fittings—As the scuppers may not be called into use until years after they have been installed it is necessary that the valve be of a material not subject to rust—our valve is of bronze hung in bronze bushings.

For Wood Floors on Cement

A special scupper is made for wood floors laid on sleepers bedded in the cement slab. The inlet is 7 in. high and the bottom of the scupper is set flush with the cement floor to take off any water that might seep through the wood floor.

Number Required

In sprinklered buildings, provide one scupper to every 500 sq. ft. of floor surface. In unsprinklered buildings one to every 1000 sq. ft. Scuppers are usually placed in the curtain walls below the windows.

Sizes and Prices

The scuppers are made for any thickness of wall and prices will be quoted on application. State thickness of wall and type of scupper required, also quantity.

Specification for Type R (Approved) Scuppers

Furnish and set in exterior walls, where indicated, cast iron scuppers with inlet not less than 12 in. wide, outlet to have an area of not less than 16 sq. in.; outlet to have a cast bronze gravity valve overlapping the end of the scupper (not recessed). Valve shall be hung in bronze or brass bushings. Above the inlet there shall be a cast iron fender extending 1½ in. into the room (can be omitted if floors are not for storage purposes). All iron parts shall have one coat protective paint (or be galvanized) before shipping. Scuppers shall have the approval of the National Board of Fire Underwriters and be included in their list of Approved Mechanical Devices. All as manufactured by the WATERTITE DRAIN & SCUPPER CO., INC., 229 East 37th Street, New York, N. Y.

Set the scuppers about 1 in. below the finished floor line. Grade a channel to it in the cement finish of the floor.

A Partial List of Recent Installations

Kelly Springfield Tire Co., Cumberland, Md.
American Can Co., Honolulu, T. H.
Studebaker Body Co., South Bend, Ind.
Stanley Works, New Britain, Conn.
James Butler Warehouse, Long Island City, N. Y.
Eastman Kodak Co., Rochester, N. Y.
U. S. Army Supply Base, Brooklyn, N. Y.
U. S. Army Supply Depot, New Orleans, La.
Winchester Repeating Arms Co., New Haven, Conn.
B. F. Goodrich Rubber Co., Akron, Ohio
R. H. Macy Co. Warehouse, New York, N. Y.
Illuminating Building, Cleveland, Ohio
Westinghouse Air Brake Co., Wilmerding, Pa.
American Thread Co., Dalton, Ga.
General Electric Building, Cincinnati, Ohio
Great Atlantic & Pacific Tea Co., Philadelphia, Pa.

WINDSHIELD SCUPPER COMPANY

Sole Manufacturers of Windshield Scuppers

16 Warren Street, NEW YORK, N. Y.

SALES REPRESENTATIVES

BOSTON, MASS., E. A. Simpson, 141 Milk Street
CHICAGO, ILL., Harrison-Weise Co., 228 No. La Salle Street
CLEVELAND, OHIO, Duplex Hanger Co., 1270 East 53rd Street
DETROIT, MICH., Theo. H. Ollesheimer, Insurance Exchange Building
KANSAS CITY, MO., C. A. Brockett Cement Co., 2035 East 19th Street
LOS ANGELES, CAL., E. R. Kuns Co., Inc., 1221 West 11th Street
MILWAUKEE, WIS., Gross Hardware & Supply Co., 216 Third Street
PHILADELPHIA, PA., Harry Kahn, 2216 West Columbia Avenue
PITTSBURGH, PA., Fort Pitt Hardware Co., 807 Liberty Avenue
ST. LOUIS, MO., F. A. Cammann Builders Service Co., 927 Century Building
SAN FRANCISCO, CAL., M. E. Hammond, Pacific Building

Sales Representatives in Other Important Cities Registered at Local Office of F. W. Dodge Corporation

Windshield Scuppers

Purpose—In the average fire, far more damage is caused by water. It is the purpose of Windshield Scuppers to reduce this to a minimum by providing a quick escape for excess water on floors. They have also proven invaluable in cases of accidental discharge of sprinklers and bursting pipes.

Underwriters' Approval—Windshield Scuppers have been tested and approved by the National Board of Fire Underwriters. Yearly re-examinations are made to assure the purchaser that no changes have been made without their sanction. This approval guarantees the full allowance in rates by all local insurance exchanges throughout the country. They also bear the approval of the Associated Factory Mutual Companies.

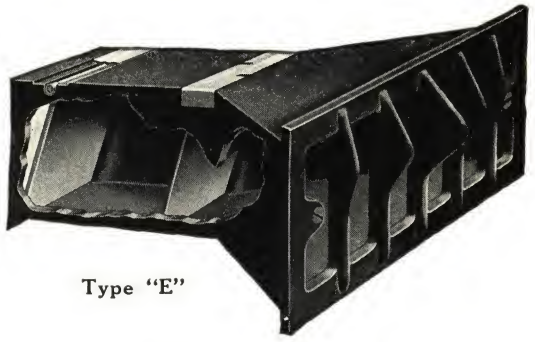
Exclusive Advantages of Windshield Scuppers—All Windshield Scuppers are cast in one piece, insuring proper setting in the same condition as when they leave the factory. Each is provided with a drip under the outlet to prevent staining face of building. All valves are provided with seats to permit a draftproof fit without binding.

Additional Features of Standard Heavy Type Windshield Scupper—This type costs more to manufacture, but possesses these additional advantages: 50% heavier and the Windshield is hung directly at the inlet, where it not only is readily subject to inspection, but can be renewed with ease during the life of the building. In case of fire in an adjacent building, the windshield acts as a fire retardant, as it is sufficiently spaced from the outer valve to act as a damper when the exterior valve has melted or fused without itself being exposed to the extreme heat.

Specification for Standard Type

Provide and install, where shown in plans Standard Type (*SG, S, KG or K*) Windshield Scupper, of proper size for wall thickness shown. Body to be cast in one piece, ⅜ in. thick, with bronze exterior weather valve, hung with bronze hinge pins and bronze bushings. To have improved, detachable (*polished brass or galvanized iron*) windshield hung on brass hinge pin, attached to grate or frame at entrance so that it can be replaced (*and with Underwriters' Approved Projecting Grate to prevent blocking.*)

(Italics denote optional features, which should conform to type selected. See Specification Data in next column.)



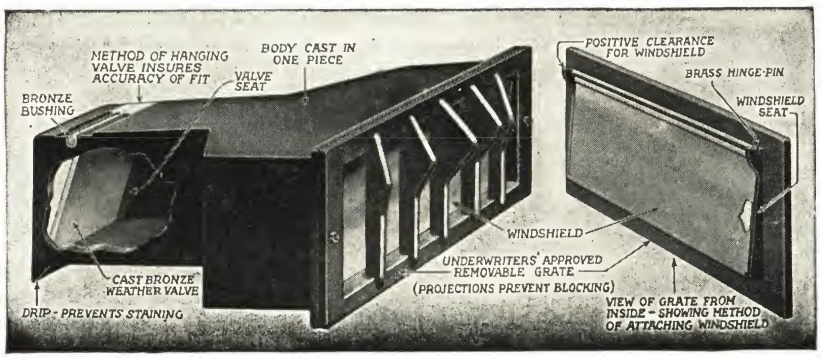
Type "E"

SPECIFICATION DATA

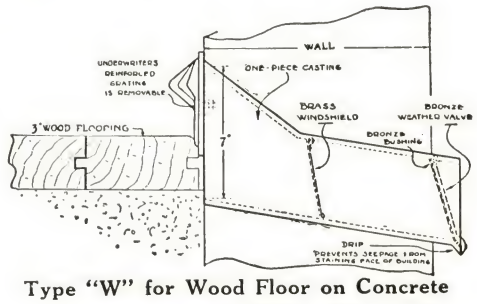
Symbol		Description
Standard Type, Heavy ⅜ in.		
"SG" "S"	With grate Without grate	Polished, lacquered brass windshield
"KG" "K"	With grate Without grate	Galvanized windshield
Special Type ¼ in.		
"E" "M"	With grate With grate	Double valve Single valve

Some Well Known Users

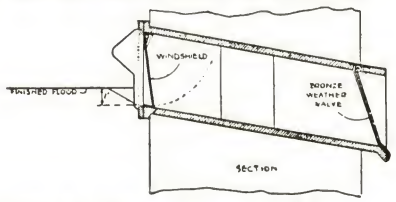
American Can Company
J. C. Penney Company
Standard Oil Company
Baltimore & Ohio R. R. Co.
Fisher Body Corp.
Real Silk Hosiery Co.
Cooper Dry Goods Co.
Westinghouse Electric & Mfg. Co.
International Shoe Co.
General Electric Co.
Studebaker Buildings
Victor Talking Machine Co.
Packard Motor Co.
Otis Elevator Co.
Liggett & Myers Tobacco Co.
Sears Roebuck & Co.
Canadian Rail & Harbor Terminal
Eli Lilly Company
Southern Bell Telephone & Telegraph Co.
R. H. Macy & Company
American Optical Co.
Delaware, Lackawanna & Western R. R. Co.
R. R. Donnelley & Sons
Montreal Rail & Water Terminal
New York Central R. R. Co.



Type "S-G" or "K-G" Windshield Scupper with Underwriters' Grate, Showing How Windshield Can Be Renewed
(Patented July 28, 1914 and March 27, 1928)



Type "W" for Wood Floor on Concrete



Showing Standard Type in Wall

A1149

ORNAMENTAL METAL WORK AND METALS IN GENERAL

ALUMINUM RESEARCH INSTITUTE

An Association Composed of Smelters and Refiners of
Secondary Aluminum and its Alloys.

308 West Washington Street
CHICAGO, ILL.

Products

Ingot Aluminum for all exterior and interior architectural and ornamental purposes.

Color and Finishes

Secondary architectural aluminum is handled in the foundry and the plating room just like any other aluminum alloy. It lends itself unusually well to the standard deplated, hi-lited, sand blasted, wire brushed, and polished finishes. Combinations of these finishes, as well as colored and anodic oxidation, may be applied.

All architectural aluminum sold by members of this Institute is produced in the United States. Since freedom from corrosion is the most important factor, this aluminum is held to more rigid specifications than are ordinarily written. At the same time, there is usually a decided saving in metal cost.

Rustless and Stainless

When the chemical composition is held to the limits specified below, secondary architectural aluminum will not rust or stain. This makes it particularly advantageous for use on the exterior of buildings as there is no danger of discoloration to adjacent material due to rust or colored salts.

Light Weight

Since aluminum is one-third the weight of the other metals commonly used for architectural purposes, there is a material saving in weight which is distinctly advantageous both from the standpoint of erection and the size of the main structural work.

Readily Cast

Aluminum of the specified composition can be readily and hence cheaply cast. Such castings are characterized by the sharp definition of every detail of the decorative design. The castings will have a pleasing color free from imperfections and defects.

Cost of Upkeep

Since aluminum needs no protective coating, there is an initial saving in erecting cost. More important than this initial saving, is the fact that it is not necessary to refinish the original aluminum surfaces, hence no cost of upkeep.

Production Facilities

One of the reasons why the use of secondary architectural aluminum ingot shows a saving in cost, is because of the modern, large capacity plants in which it is produced. This aluminum is made in large open hearth furnaces of ten to fifteen tons capacity to insure a uniform product. Every step in the manufacture of this aluminum is under the direction of highly skilled chemists and metallurgists who are specialists in the production of high grade aluminum alloys.

Specifications

Architectural aluminum ingot shall comply with these minimum chemical specifications.

CHEMICAL COMPOSITION

Silicon 4½ to 6%
Copper .30 maximum.
Iron .50 maximum.
Manganese .20 maximum.

Metal of this composition will have the maximum resistance to corrosion. These chemical specifications will be maintained as a minimum. Any deviation from this analysis will be in the direction of improving the corrosion resistance of the alloy.

PHYSICAL PROPERTIES

Tensile strength—17,000 to 21,000 lbs.
Elongation —4% to 6% in 2 inches.
Test bars made in accordance with A.S.T.M. standards.

To be sure of obtaining architectural aluminum to the above exacting specifications, send your inquiries to Aluminum Research Institute, 308 W. Washington St., Chicago, Ill.

ALUMINUM COMPANY OF AMERICA

Member of The Producers' Council

Manufacturers of Alcoa Aluminum and Its Alloys

PITTSBURGH, PA.

SALES OFFICES

ALBANY, N. Y., 90 State Street
ATLANTA, GA., 1818 Rhodes-Haverty Building
BIRMINGHAM, ALA., 1112 Martin Building
BOSTON, MASS., 20 Providence Street, Park Square
BUFFALO, N. Y., 1880 Elmwood Avenue
CHICAGO, ILL., 360 No. Michigan Boulevard
CINCINNATI, OHIO, 903 Dixie Terminal Building
CLEVELAND, OHIO, 910 Hanna Building
DALLAS, TEX., 1810 Allen Building
DETROIT, MICH., 3311 Dunn Road
FAIRFIELD, CONN., Boston Post Road
HOUSTON, TEX., 508 West Building
INDIANAPOLIS, IND., 714 Merchant's Bank Building
KANSAS CITY, MO., 804 Land Bank Building
LOS ANGELES, CALIF., 1031 South Broadway
MILWAUKEE, WIS., 735 North Water Street
MINNEAPOLIS, MINN., 1345 Northwestern Bank Building
NEWARK, N. J., 1111 Academy Building
NEW YORK, N. Y., 230 Park Avenue
PHILADELPHIA, PA., Fidelity-Philadelphia Trust Building
PITTSBURGH, PA., 2444 Oliver Building
ST. LOUIS, MO., 1825 Boatmen's Bank Building
SAN FRANCISCO, CALIF., 709 Rialto Building
TOLEDO, OHIO, 1325 Ohio Bank Building
WASHINGTON, D. C., 605-11 Southern Building

Products

ALCOA ALUMINUM and ALCOA ALUMINUM ALLOYS for all architectural and ornamental metal work for exterior and interior purposes—Wrought, Cast, Extruded, Rolled, Drawn, etc.

For our pages on Aluminum Roofing and Aluminum Paint, see Manufacturers' Index.

Alcoa Aluminum and Its Alloys

Aluminum and its various alloys have been used for nearly half a century by architects and engineers in the building field. In the past decade the use of aluminum has increased tremendously, due to the fact that architects are coming to appreciate the many unusual characteristics and valuable properties of aluminum and because the forms in which these alloys are available have had a recent marked increase. Furthermore the cost has been materially decreased. Designers and builders in all fields are continually finding new uses for aluminum alloys for structural and decorative purposes. In the construction of airplanes and dirigibles, where strength and lightness are essential, the light strong alloys of Alcoa Aluminum are employed extensively for frame members, for pistons, crankcases, and many other motor parts. These alloys are used to reduce the weight of trucks, buses, railroad and street railway cars. Engineers have also made use of them for the reciprocating parts on locomotives. Finally, in the building trade the alloys of Alcoa Aluminum are used because of their resistance to corrosion, because of their decorative possibilities, and because they reduce weight and erection costs.

Aluminum Foil is being used to replace paint and other materials for interior decoration.

Will Not Rust—The fact that aluminum will not rust and has excellent resistance to the action of the elements is well demonstrated by the Pyramid on the Washington Monument in Washington, D. C. This casting has been in place since 1884 and still retains its satisfactory appearance. Other architectural aluminum castings, that have been exposed for years to the most unfavorable climatic conditions, show no appreciable deterioration when subjected to metallographic examination.

Cast Aluminum Ornaments with Deplated and High-lighted Finishes

This Spandrel Illustrates the Minuteness of Detail and Clean-cut Lines Possible in Castings of Alcoa Aluminum—Finish Is "As Cast"

Will Not Discolor Adjoining Materials—Alcoa Aluminum overcomes one of the most important difficulties attending the use of metals for exterior construction—namely, the danger of discoloration to surrounding materials due to rust and colored salts washing onto the brick or stone work.

Alcoa Aluminum and its alloys will not rust and their salts are colorless.

Workability—The ductility of Alcoa Aluminum makes erection easier. It eliminates a number of difficulties encountered in working with ornamental pieces made of other metals. Alcoa Aluminum spandrels, for example, are easily fitted into the little irregularities in stone work, whereas more brittle metals are apt to crack or break.

Strength—The strength of the light strong alloys of Alcoa Aluminum may not be fully appreciated by every one.

Some may, therefore, be surprised to learn that a wide variety in strength, elongation, and hardness for particular uses may be obtained.

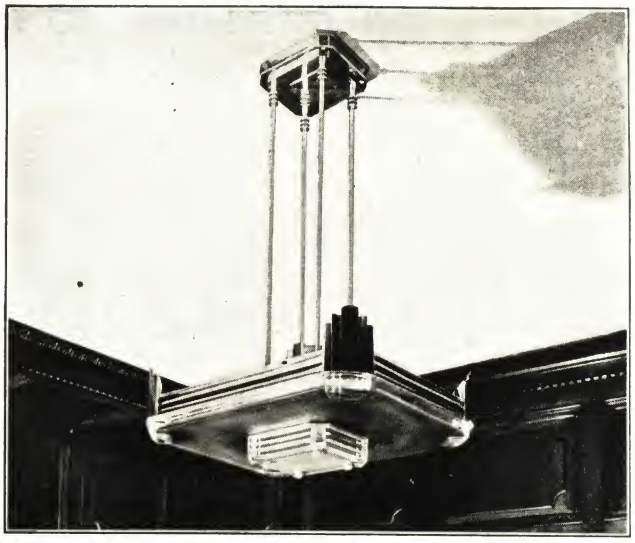
Fully annealed pure Alcoa Aluminum known as 2SO and, which is ordinarily used for stamped cooking utensils, has a tensile strength of 12,000 lb. per sq. in., 25% elongation in 2 in., and a Brinell hardness of 22.

The other extreme is Alcoa Alloys 17ST and 25ST which have a tensile strength of 58,000 lb. per sq. in., 20% elongation in 2 in., and a Brinell hardness of 100.

It should be noted, however, that while a wide variety of characteristics are available for specifications, the material as furnished is always uniformly as specified because of the strict technical control exercised over its manufacture.

Wrought Aluminum Gates

Work of this kind done in aluminum may be used for both interior and exterior purposes



An Interior Lighting Fixture of Fabricated Alcoa Aluminum, Highly Polished

Light Weight—Probably the best known characteristic of Alcoa Aluminum and its alloys is their lightness.

Pure aluminum has a specific gravity of approximately 2.7. This is about one-third the weight of other metals commonly used in building construction. The builder will readily appreciate the erection economies possible where aluminum is used. Aluminum is cheaper to haul and is easier to handle on the job than most architectural metals. Also, because of its lightness, it is quite often possible to use larger castings which eliminate troublesome joints and seams that must be waterproofed.

Two men can handle, without difficulty, a 5x6-ft. aluminum cast spandrel, whereas an identical spandrel cast in other metals would necessitate additional men and hoisting rigging.

The saving in weight becomes even more valuable in the construction of drawbridges, elevator cages, and for all moving structures in which metals are used. An interesting example is that of the bascule span of the Arlington Memorial Bridge on which the use of Alcoa Aluminum saved approximately 100,000 lb. of dead weight.

Furthermore, the use of aluminum on buildings of certain designs may possibly reduce the size required for supporting members.

Uses of Alcoa Aluminum

The many forms in which Alcoa Aluminum and its alloys are offered to the building field make possible an infinite number of uses.

This metal may be cast in sand, in permanent moulds or in dies.

It may be rolled, extruded, drawn, or fabricated from sheet strictly in accordance with the architect's designs and specifications.

Wrought aluminum is being used more and more for grilles, gates, fixtures, and wherever beautiful handmade effects are desired.

Today a large number of leading manufacturers regularly fabricate Alcoa Aluminum building products and specialties. The following list gives an idea of the

A Street Lighting Fixture Made of Cast and Spun Alcoa Aluminum

many uses to which this metal has been put in the building trade:

Balustrades	Grille work	Saddles
Columns	Gratings	Sash
Conduit	Lamp standards	Screens
Coping tiles	Lighting fixtures	Scuppers
Cornices	Mail chutes	Sheet roofing
Cresting	Marquises	Shingles
Doors	Newels	Sills
Door hardware	Ornamental fences	Skylight frames
Down spouts	Panels	Spandrels
Gutters	Partitions	Stair railings
Entrances	Pilasters	Statuary
Window frames	Radiators	Store front work
Fasciæ	Radiator covers	Store facing
Frames	Risers	Ventilators
Pendants	Treads	Weatherstrip

Color and Finishes

Every one is familiar with the bright metallic color of polished aluminum. Special finishes, however, have been developed which at first glance seem to have little relation to the common polished aluminum surface.

Deplated—A very dark bluish-gray matte finish, produced by an electro-chemical process, which is both decorative and protective. It is extensively used on spandrels.

Sand Blasted—A light gray coarse matte finish. This may also have a sparkling effect.

As Cast—The finish of the casting just as it comes from the mould. It is light gray in color, has somewhat of a matte appearance, but is a bit lighter and brighter than the sand blasted finish.

Wire Brushed—A light gray roughened surface produced by a rotating soft steel wire brush.

Satin Finish—A surface made up of fine parallel scratches produced by a very fine wire brush. The surface has a satiny sheen very "rich" in appearance.

Highly Polished—The well-known mirrorlike finish that is characteristic to aluminum.

Combinations and Etching—By combining two or more of the above finishes on a single piece or design, it is possible to produce exceedingly beautiful effects. For example, deplating and then high-lighting certain portions of a surface, produces a finish resembling the finest of hand craftsmanship.

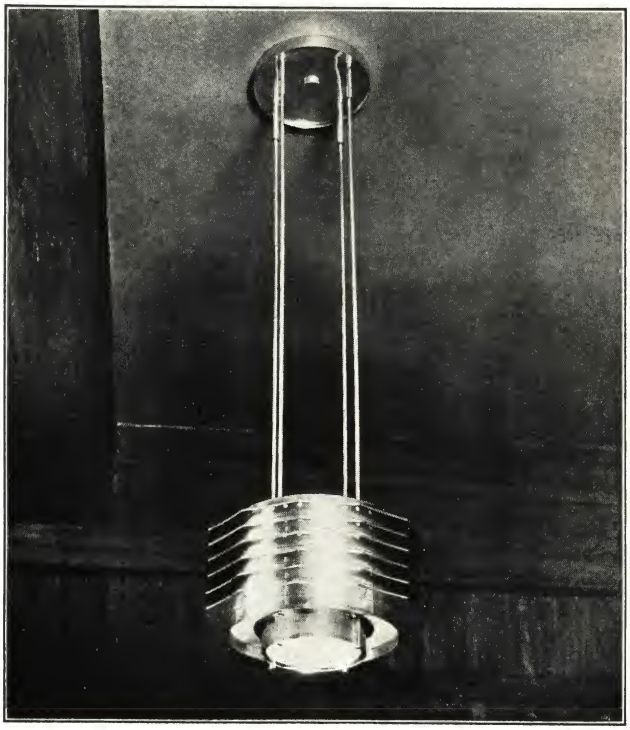
Aluminum surfaces may also be etched with any desired design.

When exposed to the weather or excessive moisture conditions, bright or polished surfaces will not hold their appearance indefinitely and must be kept protected by lacquer, varnish, or other suitable protective coating.

Elaborate Designs

Besides blending into modern architectural color schemes, Alcoa Aluminum is adaptable to all designs, no matter how intricate or elaborate. It is a metal that lends itself admirably to ornamentation. The architect, who searches for practical materials, in which to render his artistic visualization, finds in Alcoa Aluminum the metal that meets his needs. The ductility of aluminum makes it ideal for handwork—grilles, railings—and other decorative work of the most intricate design.

For Best Results, Right Alloy Must Be Specified—The importance of specifying the correct alloy



Lighting Fixture That Illustrates the Adaptability of Alcoa Aluminum to Modern Designs

cannot be overemphasized. Much research and experimentation preceded the adoption of the two alloys below.

The technical staff of ALUMINUM COMPANY OF AMERICA exercises the most rigid scientific control over every process in the production of Alcoa Aluminum and its alloys—from the mining of bauxite ore in the company's own mines to the production of strong alloys and fabricated shapes. Because of this, "Alcoa" has come to be the symbol of the highest metallurgical excellence.

The services of the company's technical staff are at all times available to architects for determining the right alloy for any particular set of conditions. The assistance of these experts may be obtained through any of our sales offices or by addressing the home office.

Alcoa Aluminum Alloy No. 43—In order to meet architectural casting requirements, Alcoa No. 43 Alloy was developed. This has a silicon content of 5%, an average tensile strength of 19,000 lb. per sq. in., 5% elongation in 2 in., and a Brinell hardness of 40. This alloy has an exceedingly good resistance to corrosion and may be cast accurately with fine detail.

Alcoa Aluminum Alloy No. 195-4—For castings where higher strength is required, Alcoa No. 195-4 Alloy is recommended. This has a tensile strength of 31,000 lb. per sq. in., 8% elongation in 2 in., and a Brinell hardness of 65. This alloy also has high resistance to corrosion.

Comparative Cost of Alcoa Aluminum

The cost of Alcoa Aluminum castings and other architectural products compares most favorably with that of any other high grade material. As an additional factor the light weight of Alcoa Aluminum alloys, with the resulting reduction in erection costs and in the size and cost of supporting members, should be given due consideration.

Since the weight of aluminum is approximately one-third that of other metals commonly used, when taken in equal volume, the actual cost of aluminum is divisible by three when comparative costs by weight are being figured.

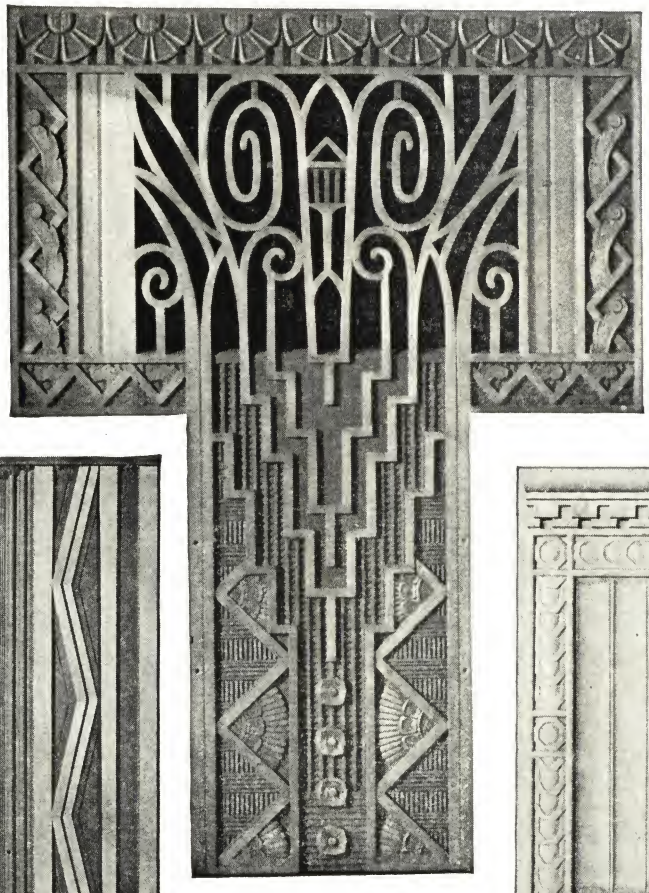
Alcoa Aluminum Spandrels

Perhaps a greater tonnage of Alcoa Aluminum is used for spandrels than for any other one building product or specialty. Hundreds of thousands of pounds of this non-rusting, light-weight metal are now being used annually for this purpose. Sand-cast Alcoa Aluminum spandrels adorn buildings that rank among the world's largest and tallest. Their beauty, economy, durability, and ease of handling appeal to the architects of metropolitan buildings as well as to architects who appreciate good design in buildings of lesser size.

Save Painting Costs—It is not uncommon for large buildings to require a budget of several thousand dollars per year for painting and protecting metal spandrels. This money is saved through the use of Alcoa Aluminum spandrels.

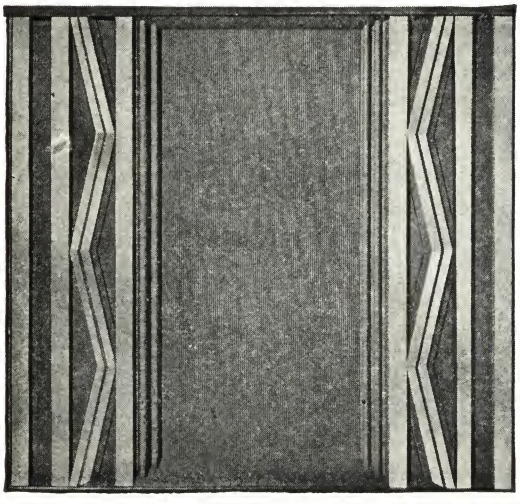
Will Not Stain—Besides having a high resistance to corrosion and needing no protection, Alcoa Aluminum spandrels will not stain adjoining surfaces because they form no colored salts with smoke, rain, or gases that might be found in the atmosphere, even in industrial districts.

Erection Easier and Costs Less—Alcoa Aluminum spandrels are very ductile and are readily fitted into the little irregularities of construction. Their light



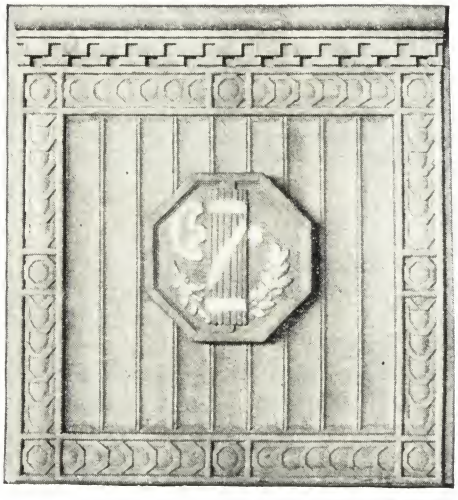
Center:

This spandrel and grille 6 ft. 11 in., 4 ft. 11¾ in. wide at the top was beautifully finished by sand blasting, deplating, wire brushing, and high-lighting. See preceding pages for explanation of these finishes



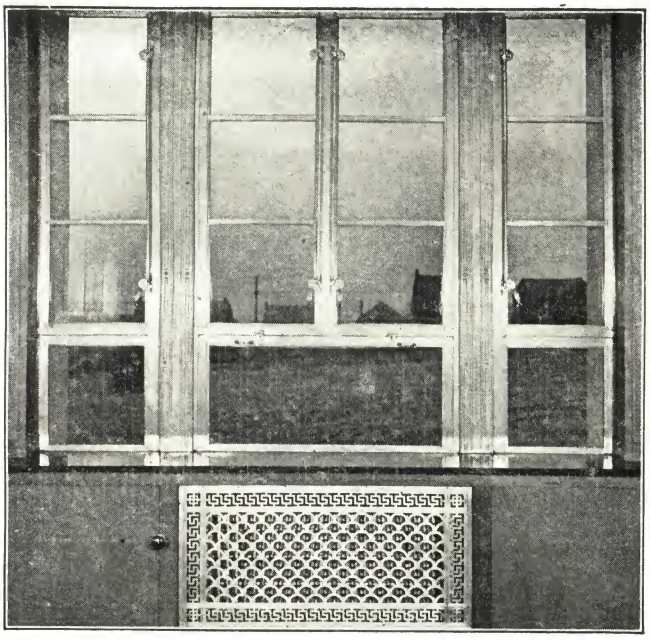
Lower left:

This sand cast aluminum spandrel, 4 ft. 4 in. wide, 4 ft. 8 in. high was finished by deplating and high-lighting

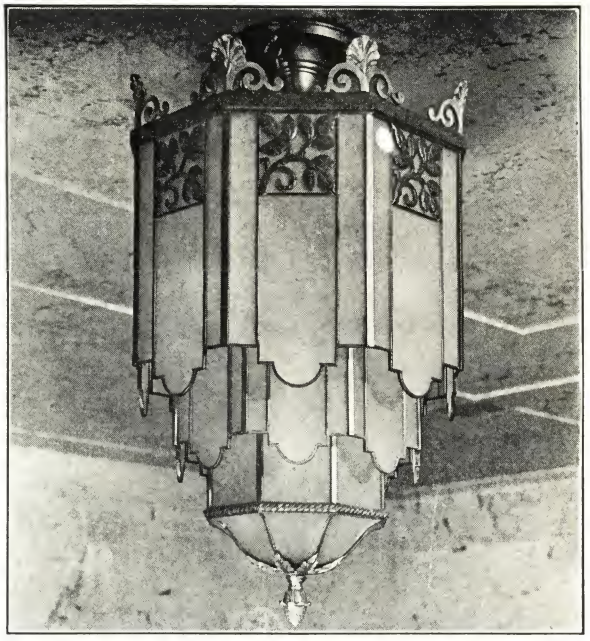


Lower right:

A vent in the center of this sand cast aluminum spandrel was hidden by a cast aluminum ornament which was deplated and high-lighted



Windows, Frames and Fittings Made of Extruded and Fabricated Alcoa Aluminum—Radiator Grille Is Cast Alcoa Aluminum



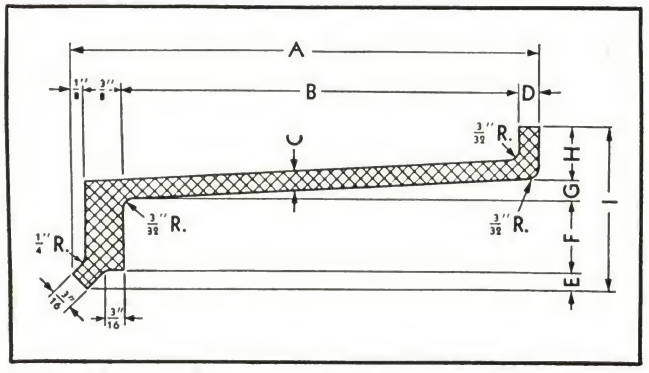
A Lobby Lighting Fixture in which All of the Metal Parts are Alcoa Aluminum

weight makes possible easier handling and lowers the costs of erection, as well as the cost of hauling.

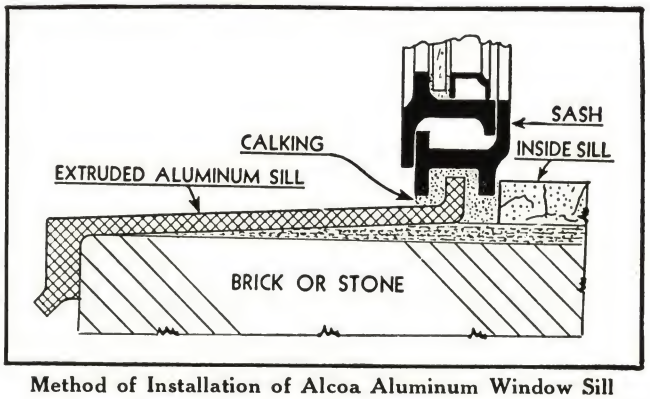
Ordinary size Alcoa Aluminum spandrels are generally handled readily by two men, which eliminates the necessity of rigging.

Elaborate Designs Possible—As shown by the illustrations, there is practically no limit to the designs possible for Alcoa Aluminum spandrels. Beautiful effects are obtained by combining various finishes, as suggested under the heading "Finishes."

Alcoa Aluminum Window Sills



Cross Section of Standard Alcoa Aluminum Window Sill



Method of Installation of Alcoa Aluminum Window Sill

Like other building materials made of aluminum, Alcoa Aluminum window sills will not streak adjoining surfaces and need not be painted because they are resistant to corrosion. They fit readily into practically any type of masonry, and because of their workability, are readily made waterproof at the joints. Because of their thinness, they occupy no more space than a masonry joint which permits a lug on either end to pass into masonry jamb. Their extreme lightness permits easy handling. They can be fully bedded-in by the bricklayer prior to setting of window frame.

Alcoa Aluminum window sills are furnished in any desired length. This eliminates troublesome vertical joints and speeds up erection. Finally, the price of these sills, extruded or cast, is generally lower than sills of other material offered to the building industry.

For the Specifications Writer—*Extruded Sill*—Window Sills shall be extruded from Alcoa No. 43S Alloy by ALUMINUM COMPANY OF AMERICA. (Note: If a size not shown here is desired, specify any width up to 9 in.) The average tensile strength shall be 19,000 lb. per sq. in. and the average elongation in 2 in. 20%. Weight shall not exceed 0.097 lb. per cu. in. Surface shall be free from imperfections and in all respects equal to sample submitted.

Cast Sill—Window sills shall be cast of Alcoa No. 43 Alloy having a silicon content of 5%. The average tensile strength shall be 19,000 lb. per sq. in. and the average elongation in 2 in., 5%. The weight shall not exceed 0.097 lb. per cu. in. The surface shall be free from imperfections and in all respects equal to sample submitted.

DIMENSIONS (INCHES) ALCOA ALUMINUM WINDOW SILLS

Dimensions	Die Numbers							
	K-2013	K-1538	K-2826	K-2231	K-2829	K-2827	K-2475*	K-2828*
A	3 5/8	4 11/16	5 1/8	5 3/4	6 3/4	8 7/8	5 3/16	5 7/8
B	2 15/16	4	4 7/16	5 1/16	6 9/32	8	.....	.....
C	3/16	3/16	3/16	3/16	3/16	1/4	.....	.....
D	3/16	3/16	3/16	3/16	3/16	1/4	.....	.....
E	3/16	3/16	3/16	3/16	5/32	3/16	.....	.....
F	11/16	11/16	11/16	11/16	27/16	11/16	.....	.....
G	3/16	3/16	5/16	3/16	11/64	5/16	.....	.....
H	1/2	1/2	1/2	1/2	5/8	1/2	.....	.....
I	1 9/16	1 9/16	1 11/16	1 9/16	3 25/64	1 11/16	1 5/8	3 17/32
Est. area, sq. in.	1.000	1.169	1.287	1.460	2.170	2.507	.....	.....
Est. wt. per ft.	1.200	1.403	1.540	1.750	2.610	3.008	.....	.....

*Specially designed sills. Drawings furnished on request.

THE AMERICAN BRASS COMPANY

Manufacturers of Extruded Bronze, Brass, Copper and Nickel Silver for Ornamental and Structural Purposes; Wire, Rods and Tubes

GENERAL OFFICES
WATERBURY, CONNECTICUT

MANUFACTURING PLANTS

ANSONIA, CONNECTICUT
BUFFALO, NEW YORK
TORRINGTON, CONNECTICUT
DETROIT, MICHIGAN
WATERBURY, CONNECTICUT
KENOSHA, WISCONSIN

CANADIAN PLANT: ANACONDA AMERICAN BRASS LIMITED, NEW TORONTO, ONT.

Products

ANACONDA from mine to consumer REG. U.S. PAT. OFF.

ANACONDA ARCHITECTURAL BRONZE, BRASS, COPPER and NICKEL SILVER for ornamental and structural purposes, in Extruded Shapes and Drawn Shapes, Sheets, Rods and Tubes for leading fabricators of ornamental and structural metal work, including Cornices, Pilasters, Grilles, Wickets, Counters, Door and Window Trim, Screens, Hand Rails, etc.

For pages on Anaconda Sheet, Roll and Strip Copper, Brass and Copper Pipe and Deoxidized Copper Tubes, and Everdur Metal, see Manufacturers' Index.

Extruded Architectural Shapes

Copper alloys which can be hot worked are successfully wrought into finished shapes by the extrusion process. This consists of forcing a bar of metal by hydraulic pressure through a hardened steel die of the proper cross-section. The resulting product is of a homogeneous texture, strong and durable, and in every way superior to castings. Extruded shapes are characterized by their dense structure and unusually smooth surface. They are entirely free from the pocked surfaces and porosities found in sand castings. The edges are sharp and clean, making possible detailed execution of the original design.

Strength — The tensile strength of Anaconda Extruded Architectural Bronze is at least 45,000 lb. per sq. in.

Dies—A large number of dies, made up during the past twenty-seven years for the production of extruded bronze shapes from designs by many leading American architects, have been released for general use. The availability of these dies often eliminates the expense of special die-making, reducing the cost of the finished metal work.

An example of the design possibilities that lie in the use of Anaconda Shapes extruded from these standard dies is illustrated on the following page.

Available Shapes

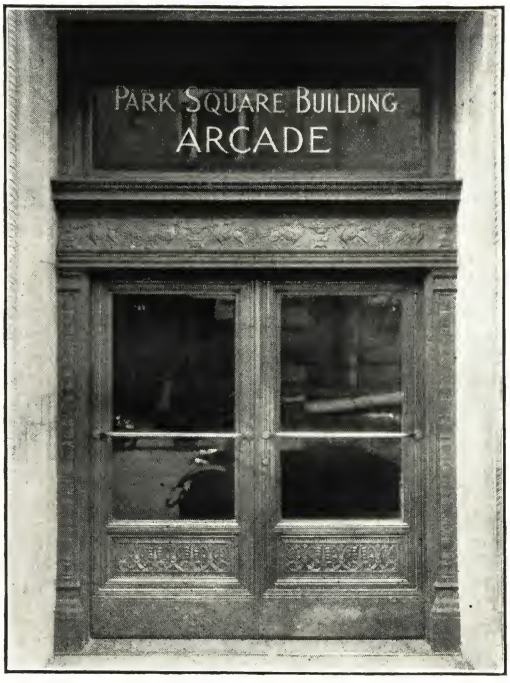
The catalogue, "Anaconda Architectural Bronze Extruded Shapes," illustrating full-size cross-sections of the several thousand shapes for which dies are available, will be sent upon request. The book is supplemented with a set of plates in full color, one of which is reproduced at the right. Complete sets of these plates may be had for the asking.

Color of Extruded Bronze

Anaconda Architectural Extruded Bronze Shapes possess a natural golden color. After exposure the metal darkens and assumes the characteristic color of bronze. For interior use, the metal can be artificially colored to obtain any desired effect. Extruded bronze is successfully matched in color with bronze sheets and castings.

Production Facilities

THE AMERICAN BRASS COMPANY is equipped for extensive production of Anaconda Architectural Extruded Shapes. The Company has complete facilities for serving the East from its plant at Ansonia, Conn., and the West from its plant at Kenosha, Wis. and in Canada from the plant of Anaconda American Brass Ltd., New Toronto, Ont. Inquiries or orders should be sent to the nearest mill.



Entrance of Park Square Building, Boston, Mass.
DENSMORE, MCCLEAR & ROBBINS, Architects
Bronze castings used in conjunction with Anaconda Extruded Bronze Shapes

Cold Drawn Architectural Shapes

When light mouldings and shapes are required with walls ⅛ in. or less in thickness, the drawn process is used to produce Anaconda Architectural Bronze, Copper and Nickel Silver Shapes.

A wide range of alloys can be worked by this method, offering color combinations not possible with extruded shapes.

These cold drawn shapes are used for numerous architectural purposes, such as interior trim, window frames, showcases, store fronts, etc.

A catalogue illustrating the dimensional cross-sections of the thousands of cold drawn shapes for which dies are available, is offered to architects and draftsmen.

ANACONDA
ARCHITECTURAL
DRAWN & EXTRUDED SHAPES
PLATE 30

STANDARD ANACONDA ARCHITECTURAL DRAWN AND EXTRUDED SHAPES ARE EFFECTIVELY COMBINED IN THE EXECUTION OF A RECESSED STORE ENTRANCE, DECORATIVE CORNICE AND LIGHTING FIXTURE, FOR THE LOBBY OF AN OFFICE BUILDING.

THE AMERICAN BRASS COMPANY
GENERAL OFFICES · WATERBURY, CONN.

Anaconda Forging Bronze

Anaconda Forging Bronze possesses a permanent richness of appearance comparable to that of statuary bronze. In this metal the craftsman finds excellent working properties that permit reduction to the thinnest section without cracking. Anaconda Forging Bronze is well suited to the execution of the most simple or most intricate designs, as the metal is equally well adapted to heavy bar work and to the delicate work in flowers, leaves, rosettes and other ornaments hammered from sheet.

The illustration at the foot of this page is a photographic reproduction of a section of a radiator grille fabricated in Anaconda Forging Bronze from designs by Graham, Anderson, Probst & White, Architects. In this instance no finish was applied to the grilles. They were installed just as they came from the fire.

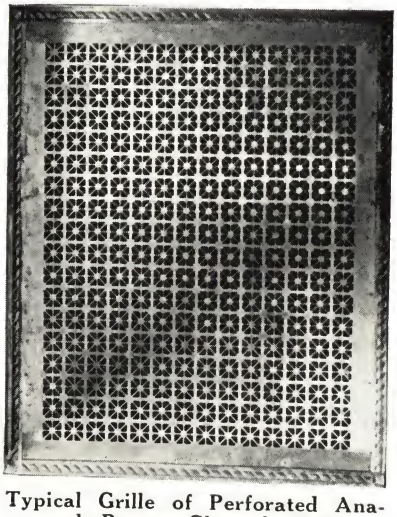
White Forging Metal

Ambrac Metal is successfully hot forged in the same manner as is iron and steel. This alloy, composed principally of copper and nickel, is white clear through and combines great strength with unusually high resistance to corrosion. Unlike other high strength white metals, Ambrac is not refractory, but can be worked almost as easily as brass.

Metal Grilles

Fabricators are producing Anaconda Brass, Bronze and Nickel Silver grilles of all types, in both cast and perforated form. The use of the perforated grille, stamped from a heavy sheet of metal, has increased greatly, since this type of grille has an attractive appearance and is produced at considerably lower cost. The products of leading grille manufacturers are available in Anaconda Brass, Bronze and Nickel Silver, the basic materials being supplied by THE AMERICAN BRASS COMPANY in ingot and sheet form. The accompanying illustrations show both the cast and perforated type of grille.

Typical Grille of Cast Bronze, Beresford Apartments, New York, N. Y.
EMERY ROTH, Architect



Typical Grille of Perforated Anaconda Bronze, Chevrolet Building, Flint, Mich.
WRIGHT & NICE, Architects

Terrazzo Dividing Strips

With the increased popularity of terrazzo work, considerable attention has been given the development of strips that would serve well the double function of setting off the terrazzo design and of minimizing the danger of cracking from expansion and contraction. Leading strip manufacturers are fabricating their product from Anaconda Brass and Nickel Silver.

Manufactured Forms

Anaconda Architectural Bronze, Brass and Nickel Silver are produced in the form of rods, bars, sheets, drawn shapes and extruded shapes, and casting ingots, fully meeting the requirements of designers and fabricators of fine ornamental metal work.

Estimates and Co-operative Service

THE AMERICAN BRASS COMPANY offers full co-operation in furnishing estimates and in determining the suitability of Anaconda Metals for various building uses. While estimates can usually be prepared from detailed blue prints and specifications, a representative of THE AMERICAN BRASS COMPANY will be sent at any time to consult with architects or fabricators wherever such consultation is requested.

Architects Samples Corporation Exhibit

The permanent exhibit of THE AMERICAN BRASS COMPANY with the Architects Samples Corporation in New York City consists of Architectural Extruded Shapes, Brass and Bronze Grilles, Anaconda "67" Brass Pipe, and Anaconda "85" Red-Brass Pipe, copper sheet metal work, etc.

Section of Grille of Forged Anaconda Bronze
GRAHAM, ANDERSON, PROBST & WHITE, Architects

AMERICAN BRONZE CO.

Ornamental and Architectural Bronze Work

OFFICE AND FACTORY

1316-1318 West 63rd Street, CHICAGO, ILL.

Products

ORNAMENTAL, ARCHITECTURAL and STATUARY BRONZE WORK, which includes: Monumental Bronze Work; Doors; Memorial and Commercial Tablets; Statuary; Cast Bronze Letters; Numerals and signs for buildings; Stair Rails; Brackets, Grilles and Wickets; Thresholds; Flagpole Bases; Fountains; Clocks; Check Desks, Bronze Inkwell Stands combined with Reflectors; Name Plates, or anything in Ornamental, Architectural and Statuary Bronze.

Illuminated Signs made in cast bronze and drawn metal.

Prices

Quotations submitted promptly upon receipt of specifications.

Catalogues

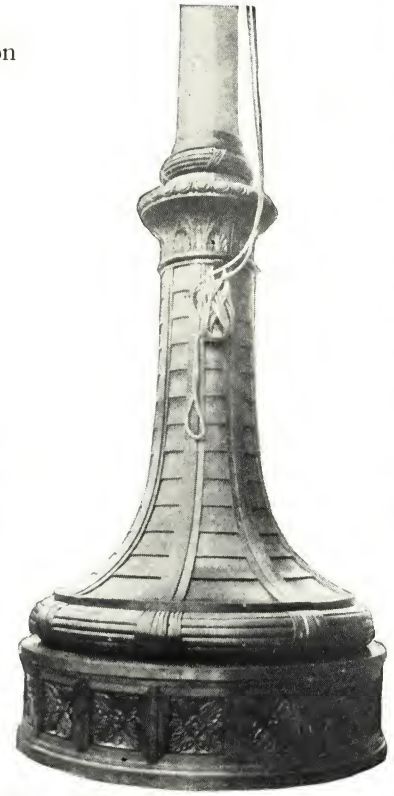
Obtained on application.

Service

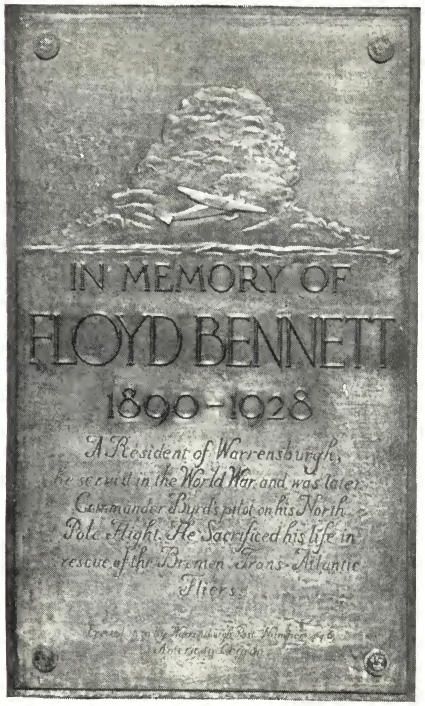
All work is made to order, in any size, or shape. Architects' special designs and ideas will be carefully followed.

Work made and shipped complete, ready for erection, to any part of the country. All workmanship and material is guaranteed to be of the very best.

Statue Erected at City of Aberdeen, Aberdeen, S. D.

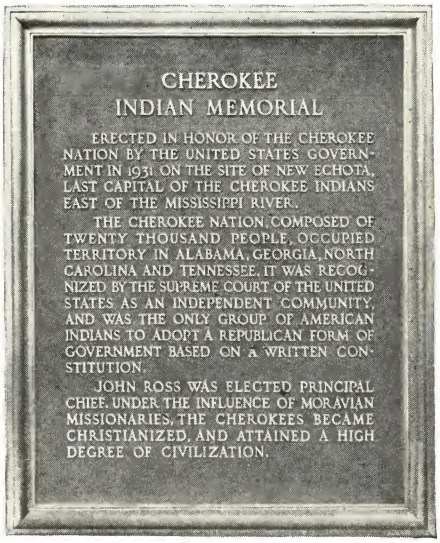


Flagpole Base Erected Internal Revenue Building, Washington, D. C.



Cast Bronze Illuminated Sign with Glass Face

May be had in either ornamental or plain design, and in any size



Cherokee Indian Memorial Tablet

ART METAL CONSTRUCTION COMPANY

Distinctive Architectural and Decorative Bronze and Other Metals

JAMESTOWN, N. Y.

For Branch Offices, see Bank, Office and Library Equipment Section

For Sectional Metal Office Partition, Hollow Metal Doors and Trim, Bank, Office, Library and Hospital Equipment, see Art Metal Construction Company in Manufacturers' Index

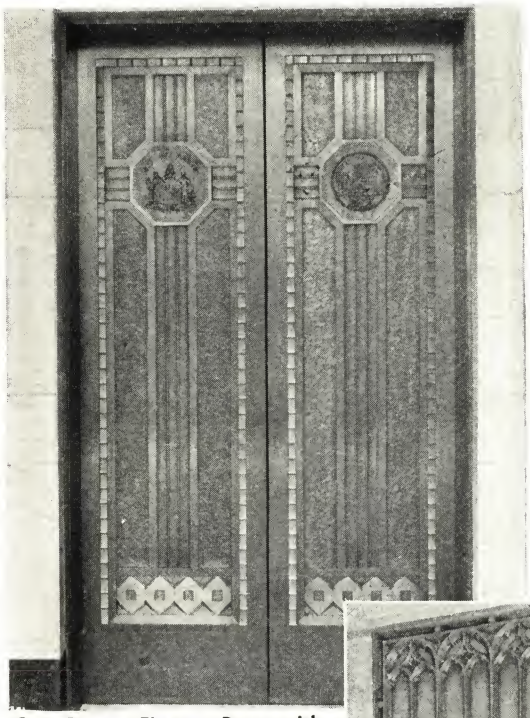
ART METAL CONSTRUCTION COMPANY is equipped to produce bronze work of the highest quality. Skillful artisans faithfully model the architect's details to produce delicately wrought, sharply incised, or crisply undercut effects.

The company is also equipped to meet the present-day vogue for the use of bright metals in architectural treatments, producing beautiful effects in aluminum, stainless steel and other metals.

One example of cast metal spandrel is shown on this page. We are regularly executing work of this nature.

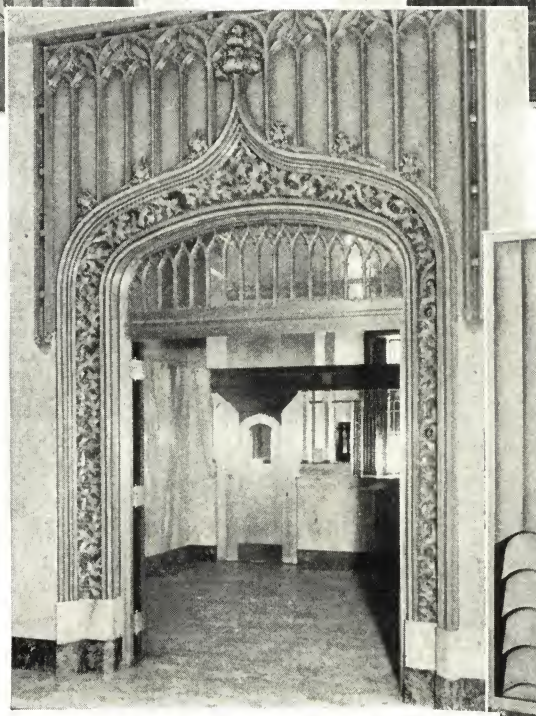
Art Metal
Jamestown, New York
U.S.A.

TRADE-MARK

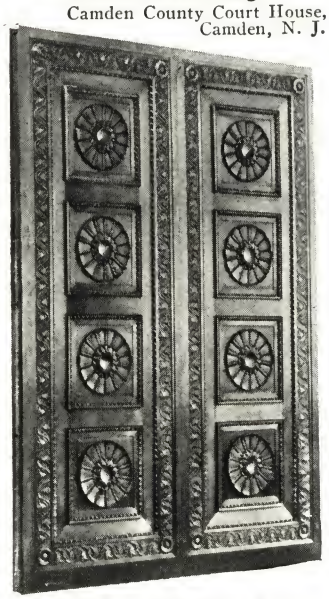


Cast Bronze Elevator Doors with Cast Aluminum Medallions and Chromium Mouldings
Camden County Court House, Camden, N. J.

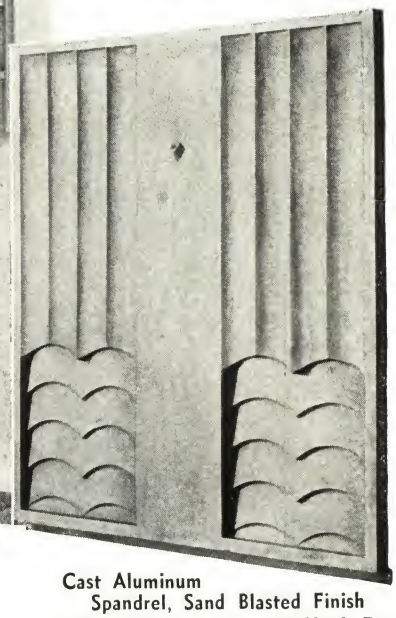
Cast Bronze Entrance Doors
Camden County Courthouse, Camden, N. J.



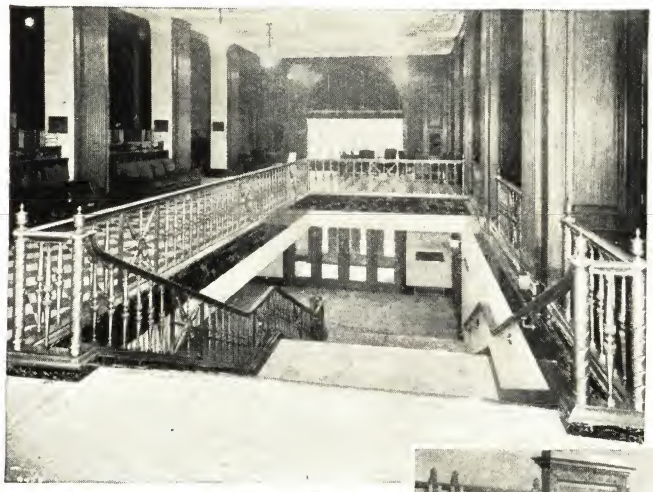
Bronze Wall Panels, Transom, Doors and Frames
City Hall, Atlanta, Ga.
G. LLOYD PREACHER & Co., Architects



Cast Bronze Entrance Doors
Federal Reserve Bank, Richmond, Va.
Weight of each door, 825 lbs.



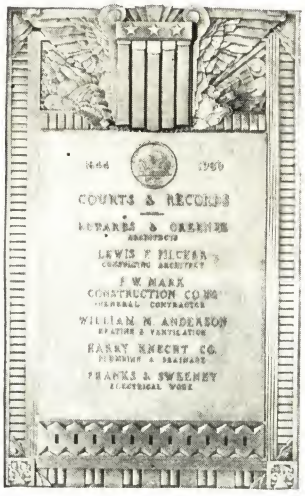
Cast Aluminum Spandrel, Sand Blasted Finish
Odd Fellows' Temple, Bradford, Pa.
THOMAS K. HENDRICKS, Architect



Cast Bronze Balustrade, Counter Screens, Entrance and Vestibule Doors
First National Bank, Atlanta, Ga.

Bronze Screen, Wickets, Pilasters and Office Door
American Building Association, Washington, D. C.

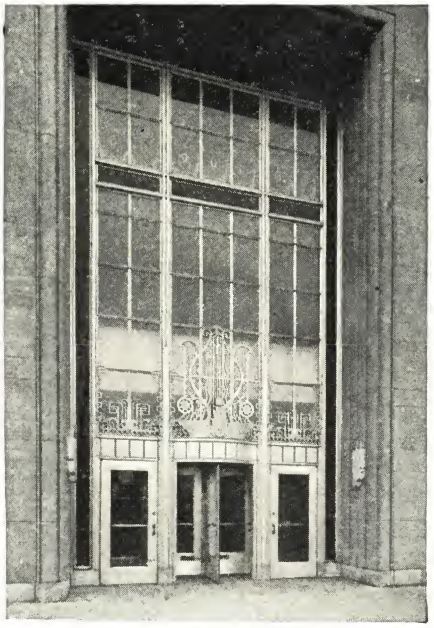
Cast Bronze Check Desk
American Building Association, Washington, D. C.
O. Harvey Miller, Architect



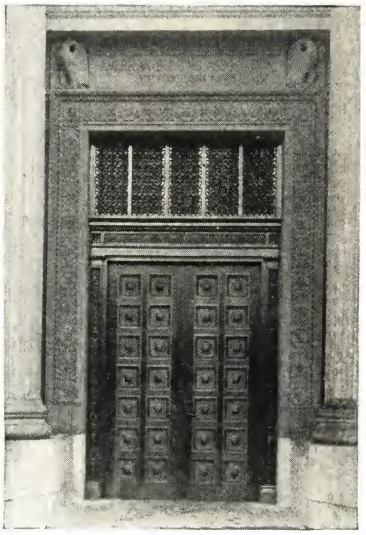
Cast Bronze Tablet
Camden County Courthouse, Camden, N. J.
Edwards & Green, Architects

Cast Bronze Directory Board
Frost & Henderson, Architects

Central Main Entrance in Bronze
City Hall, Atlanta, Ga.
G. Lloyd Preacher & Co., Architects



Complete Aluminum Entrance, Including Revolving Doors and Enclosures, Swing Doors, and Cast Aluminum Ornaments
National Town and Country Club, Cleveland, Ohio
George B. Post & Sons, Architects
Thompson Starrett Co., General Contractors



Cast Bronze Entrance Doors, Frames and Transom Grilles
American Building Association, Washington, D. C.
O. Harvey Miller, Architect

BOHN ALUMINUM & BRASS CORP.

Extruded Architectural Shapes

DETROIT, MICH.

BRANCH OFFICES

NEW YORK, N. Y., 837 Chrysler Building
CLEVELAND, OHIO, 709 Guardian Building
CHICAGO, ILL., Wrigley Building
PITTSBURGH, PA., 1201 Union Trust Building

BOHNALITE AND BOHNOLLOY EXTRUDED SHAPES

Bohnalite and Bohnolloy extruded shapes are manufactured in a wide variety of designs, a few of the many cross-sectional profiles appearing at the bottom of this page.

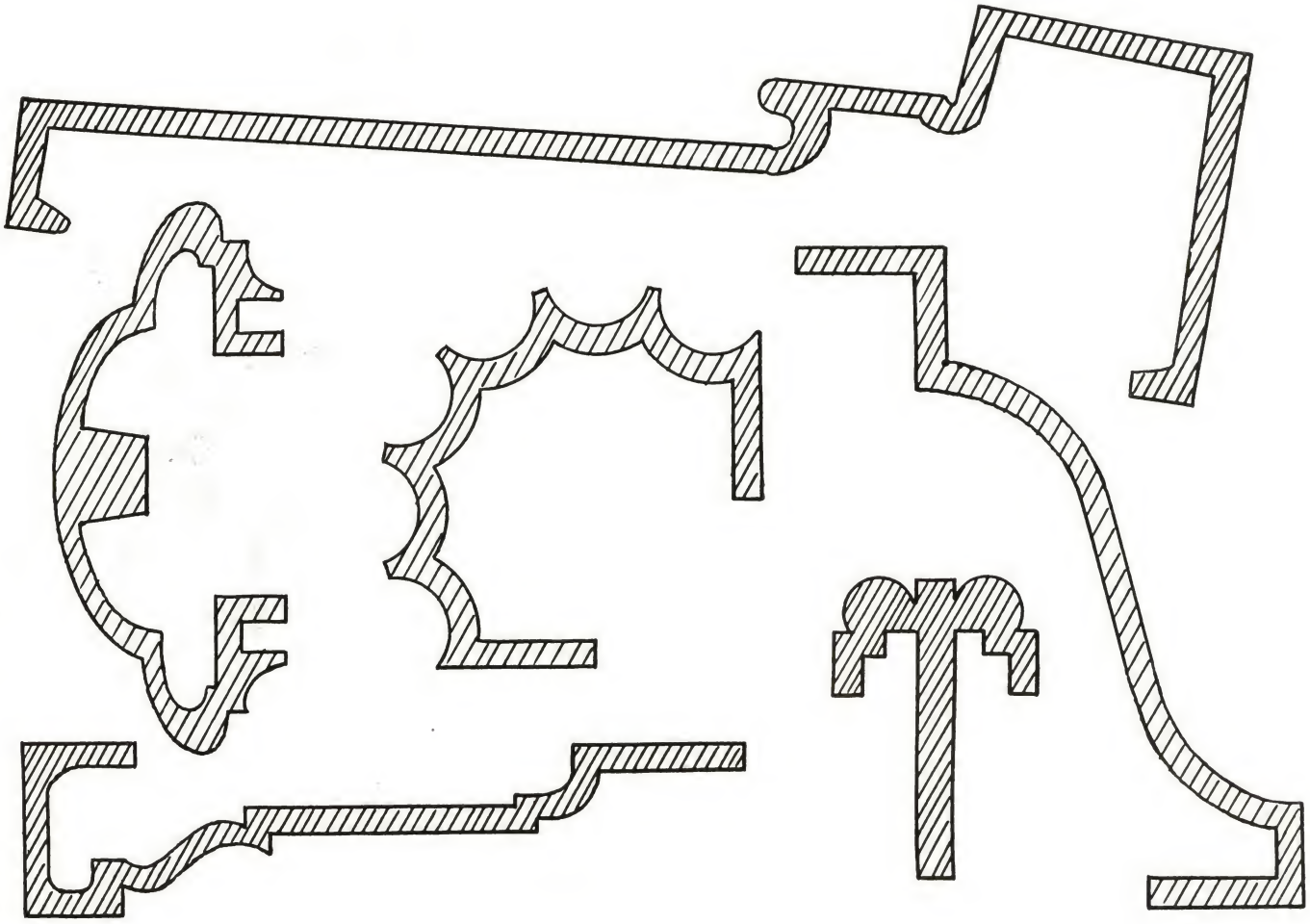
Bohnalite aluminum alloys, covering the entire range recognized for architectural purposes, are manufactured according to the most exacting metallurgical specifications.

Bohnolloy architectural bronzes and nickel-bronzes have a wide application in the decorative and utility branches of modern architecture.

BOHNALITE
BOHNOLLOY

Fabrication of Bohnalite and Bohnolloy metals is accomplished with ease. Punching, drilling, tapping, mitering and welding are made easy for the fabricating shop by close metallurgical supervision and control throughout the process of manufacture. Face contours and profiles are sharp and true to design, and interlocking parts may be assembled with minimum labor cost.

In specifying Bohnalite and Bohnolloy, architects obtain the best expression of their individuality, and also give the owner the best that can be obtained.



BOHNALITE ALUMINUM ARCHITECTURAL CASTINGS

Description

Castings are manufactured with quality, beauty and utility uppermost, and under the rigid specifications necessary to produce a casting capable of enduring throughout the life of your building, and worthy of its adornment.

Bohnalite aluminum castings are furnished in the standard range of finishes.

With anodic treatment, commonly known as "deplating," and high-lighting, very beautiful and striking effects are obtained.

Advantages

From an economical and engineering standpoint, Bohnalite aluminum architectural castings have a distinct advantage over many other metals and materials, having a specific gravity of approximately one-third that of cast iron and bronze. With this weight differential, material costs and fabricating and erecting costs are materially lessened, plus a more favorable "dead-load" factor.

Corrosion Resistance

Bohnalite castings are produced with a dense crystalline structure, of virgin, uncontaminated metal, thus offering the maximum resistance to surface and intercrystalline corrosion.

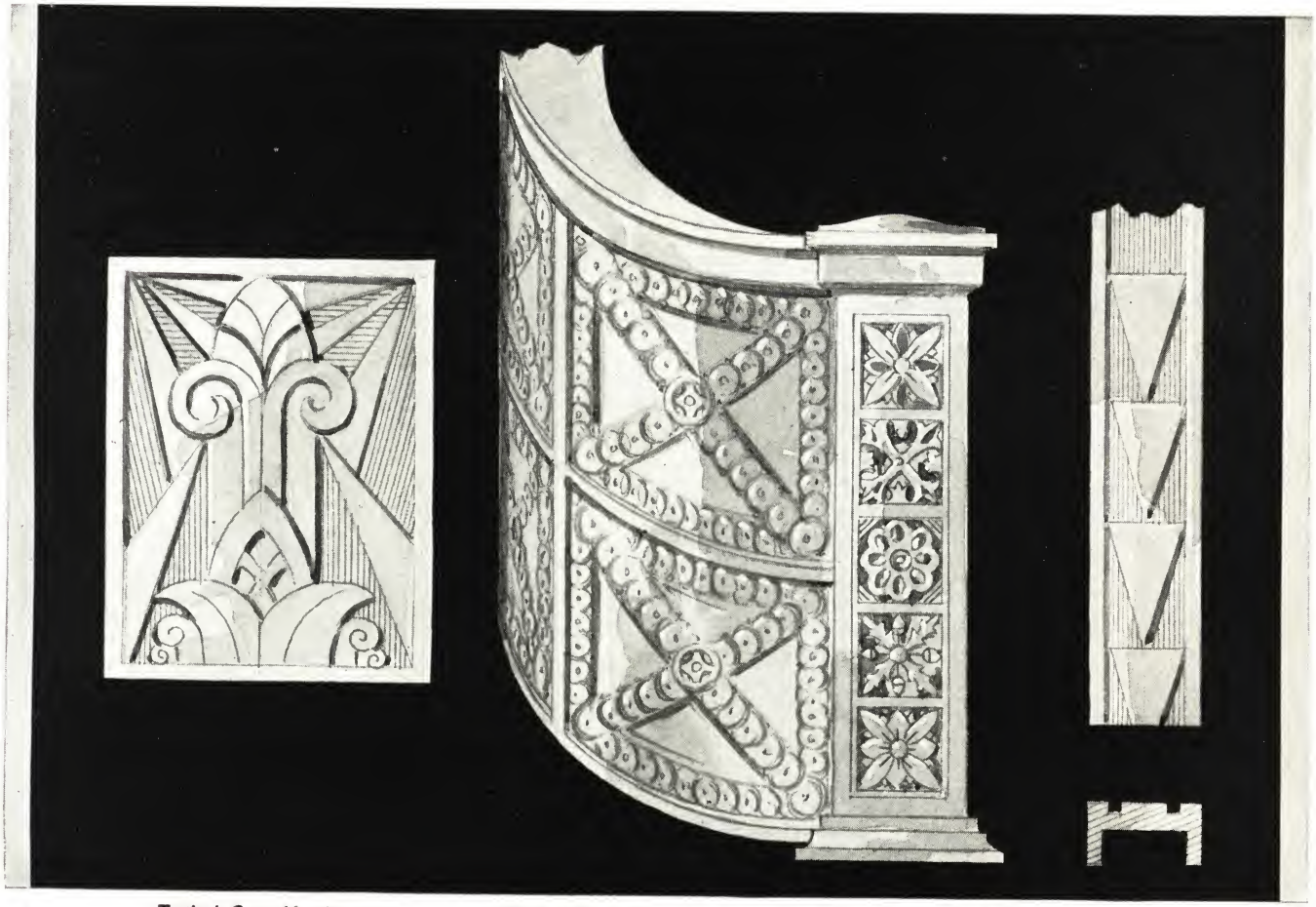
Where Used

Typical examples of the use of Bohnalite castings are found in spandrels, newels, stair rails and panels, mullions, head ornaments, panels and grilles.

Specify Bohnalite

For your project, insist upon Bohnalite specifications, manufactured under well-defined methods and processes. By avoiding the use of substitutes or "seconds," the architect opens a greater scope for his motifs, and the building and its owner obtain quality and endurance combined with the beauty created by his architect.

Our Architectural and Metallurgical Departments are ready to assist or offer suggestions with any problem you may have.



Typical Cast Aluminum Spandrel

Typical Cast Aluminum Newel with Extruded Handrail and Cast Panels

Elevation and Section of Typical Cast Mullion

A. J. BAYER CO., INC.

Ornamental Iron and Bronze

EXECUTIVE OFFICES AND FACTORY

PRIVATE EXCHANGE
LAfayette 2171

Santa Fe and Slauson Avenues, LOS ANGELES, CALIF.

SAN FRANCISCO BRANCH OFFICE: Capitol Art Metal Co., Inc.

BRANCH FACTORIES

SAN DIEGO, CALIF., Bayer-Offenhauser, Inc.

HOUSTON, TEX., Bayer-Voigtlander, Inc.

AGENCIES IN OTHER PRINCIPAL CITIES

For our page on Hollow Metal Doors, see Manufacturers' Index

Experience

This company has served the building industries since 1900 in the manufacture and installation of ornamental metal and hollow metal in monumental and commercial buildings.

Facilities

A complete manufacturing plant and foundry is maintained for the execution of work ranging from miscellaneous iron work to the highest grade of architectural bronze and iron.

Recent Installations and Their Architects

City Hall, Los Angeles, Calif.
Austin, Martin & Parkinson

Hunter-Dulin Building, San Francisco, Calif.
Schultze & Weaver, New York, N. Y.

Breakers Hotel, Palm Beach, Fla.
Schultze & Weaver, New York, N. Y.

National Bank of Commerce, Houston, Tex.
A. C. Finn and Kenneth Franzheim, New York, N. Y.

Smith-Young Tower, San Antonio, Tex.
Atlee B. and Robert Ayres

Bullock's, Los Angeles, Calif.
John and Donald B. Parkinson

Title Insurance & Trust Building, Los Angeles, Calif.
John and Donald B. Parkinson

Publix Theatre, Portland, Ore.
Rapp & Rapp, Chicago, Ill.

Publix Theatre, Seattle, Wash.
Rapp & Rapp, Chicago, Ill.

Biltmore Hotel, Los Angeles, Calif.
Schultze & Weaver, New York, N. Y.

Richfield Oil Building, Los Angeles, Calif.
Morgan, Walls & Clements

Alamo National Bank, San Antonio, Tex.
Anderson, Graham, Probst & White, Chicago, Ill.

Bronze Seat, Bank of America, Los Angeles, Calif.
SCHULTZE & WEAVER, Architects

Cast Bronze Door, Title Insurance and Trust Building, Los Angeles, Calif.
JOHN AND DONALD B. PARKINSON, Architects

ESTABLISHED 1878

C. H. BUCK & CO., INC.

INCORPORATED 1899

Cast Bronze Letters and Tablets

BOSTON, MASS.

Products

STOCK CAST BRONZE LETTERS in Architectural, Gothic and Scotia Styles.

TABLETS, Cast or Fabricated, for banks, churches and memorials.

METAL SIGNS, NAME PLATES and DESK SIGNS.

Cast Bronze Letters

Style "A" is carried in more than 20 sizes, from 1 to 15 inches high and in condensed, regular and extended widths. Included in the various fonts are the long-tail "R" and broad "C," "G," "O" and "Q."

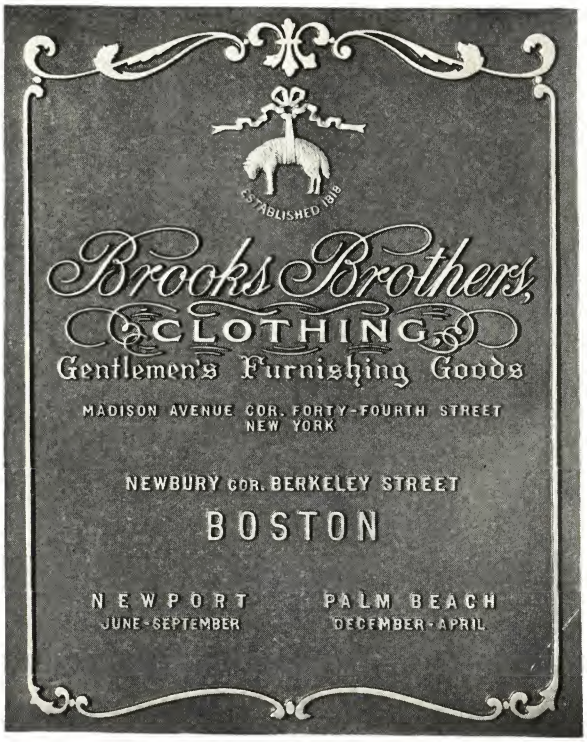
All letters are drilled and tapped on the back, ready for immediate shipment. Face and edges of letters larger than 5 inches are sand finish.

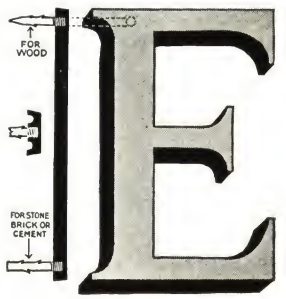
We carry what is probably the largest stock of letters in this country and are in a position to make immediate shipments. All letters are drilled and tapped to receive machine screws or spugs.

Customers

Users of special and stock cast bronze letters and tablets:

Union League Club, San Francisco, Cal.
National Shawmut Bank, Boston, Mass.
Old Colony Trust Company, Boston, Mass.
Atlantic National Bank, Boston, Mass.
Federal National Bank, Boston, Mass.
First National Bank, Boston, Mass.
City Departments, Boston, Mass.
Boston & Maine R. R.
Bethlehem Ship Building Corp.
Besse System Stores, New England and other States
Liggett Drug Co., New England and other States
United Shoe Machinery Corp., New England and other States
Andrew J. Lloyd Co., Boston and Worcester, Mass., and Providence, R. I.
The Outlet Department Store, Providence, R. I.
Hawaiian Trust Co., Honolulu, T. H.
Chase & Sanborn, United States and Canada.
F. W. Woolworth Co., Boston, Mass., and other cities
National Biscuit Co., New York, N. Y., and other cities





ESTABLISHED 1844

THE CINCINNATI MFG. CO.

Architectural and Ornamental Metal Work

MAIN OFFICE, FACTORY AND FOUNDRIES

CINCINNATI, OHIO

Products

ARCHITECTURAL and ORNAMENTAL METAL WORK in Aluminum, Nickel Silver, Bronze, Brass, Iron and other metals:

Vestibules, Entrances, and Doors.

Metal Work for banks, Government and office buildings: Railings; Wickets and Grilles; Check Desks, etc.

Iron and Wire Work.

Memorial Tablets and Bronze Signs.

Mausoleum Doors.

Elevator Cabs, Doors, and Collapsing Gates.

Wire Guards and Partitions.

For our page on Kalamein and Hollow Metal Doors, see Manufacturers' Index.

CINMANCO 1844
TRADE-MARK

The illustrations on this page indicate the scope of CINMANCO's activities—from modest tablets to majestic building entrances.

Fully Meet Government Specifications

CINMANCO specializes in architectural and ornamental metal work for Government and bank buildings.

Our illustrated Bank Catalog No. 50 will be gladly sent upon request.

Estimates, Designs and Co-operation

CINMANCO is prepared to furnish original or stock designs, plans or suggestions, and to co-operate with architects in every way possible.

We welcome an opportunity to submit estimates on your plans and specifications.

Experience

Since 1844 THE CINCINNATI MFG. CO. has pioneered in the art of metal craftsmanship.

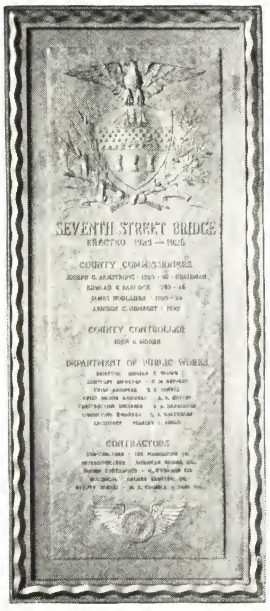
This company was one of the first to work in *nickel silver* and other white metal alloys.

Through this thoroughly trained organization the architect finds precise interpretation of his designs—in Bronze, Nickel Silver, Iron, Aluminum, and other metals. Experience has provided CINMANCO Craftsmen with all the finer points of their art necessary to express strength, exquisite beauty, and the modern spirit in metals.

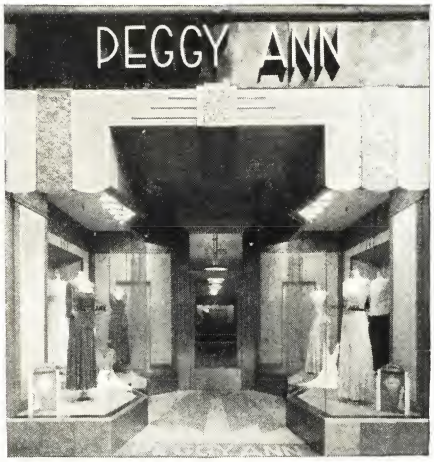
Some Recent Installations

Louisville Trust Co., Louisville, Ky.
Cincinnati Club, Cincinnati, Ohio
Toledo Art Museum, Toledo, Ohio
Southern Bell Telephone Building, Evansville, Ind.
The Fair Store, Fort Worth, Tex.
Union Trust Building, Little Rock, Ark.
Fifth Third Union Trust Building, Cincinnati, Ohio
Calhoun, Cherokee, Vernon Dial Offices, Atlanta, Ga.
Butler Art Institute, Youngstown, Ohio
Warner Bros. Theatre, Youngstown, Ohio

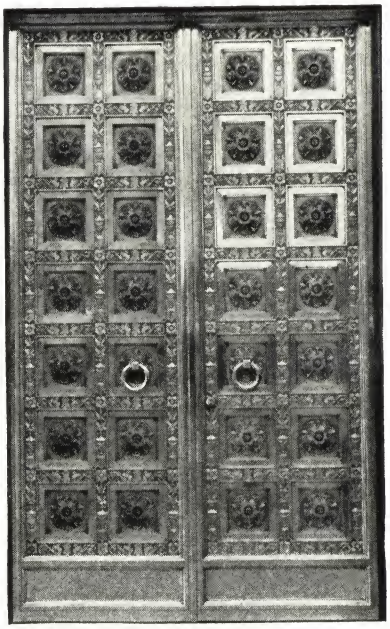
Bronze Check Desk, Morris Plan Bank, Evansville, Ind.



One of Six Bronze Tablets (7 Ft. High), Seventh Street Bridge, Pittsburgh, Pa.



Nickel Silver Store Front, Carew Tower, Cincinnati, Ohio



Bronze Doors, Cincinnati Bank and Trust Co., Cincinnati, Ohio

Ticket Booth and Doors, Warner Bros. Theatre, Youngstown, Ohio

CROWN IRON WORKS COMPANY

Manufacturers of Distinctive Ornamental Metals Since 1878

MINNEAPOLIS, MINN.

Products

Ornamental Iron, Aluminum and Bronze Work of every description for buildings, including Store Fronts, Spandrels and Tablets.

Facilities

Our plant consists of modern equipped shops and departments such as: modeling, pattern shop, foundry, machine and finishing shops.

Territory

We are prepared to furnish and erect our work in the United States and Canada.

Specialties

We specialize in the manufacture of Artistic Bronze, Iron and Aluminum; our excellent cast work is well known.

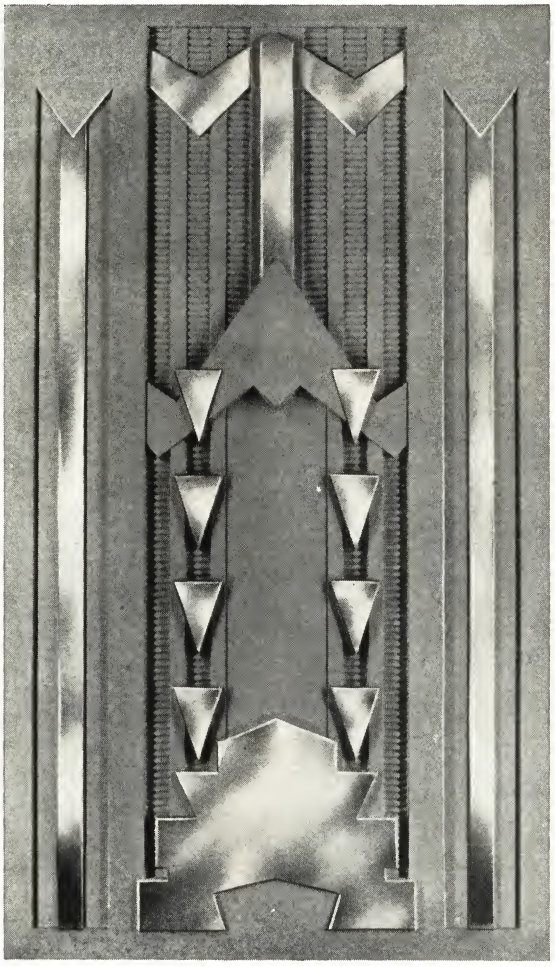
Service

The Engineering and Estimating Departments are always at the service of architects and contractors.

References

Half a century of uninterrupted business progress, with a reputation for fair dealing and high class craftsmanship.

We will be glad to furnish specific references and inform you of our nearest installation for your inspection.



Aluminum Spandrel 6 Ft. 10 Ins. x 4 Ft., Northwestern Bell Telephone Building, Minneapolis, Minn.

A Partial List of Some of Our Most Recent Installations

Building	Location	Architect
Mutual Home and Savings Association Building	Dayton, Ohio	Scheck & Williams
Northwest Bell Telephone Building	Minneapolis, Minn.	Hewitt & Brown
National Bank of Montana	Helena, Mont.	Shanley, Willson & Hugenin
National Park Bank	Livingston, Mont.	Shanley, Willson & Hugenin
World War Memorial Building	Pierre, So. Dak.	Hugill & Blatherwick
Alexander Ramsey Junior High School	Minneapolis, Minn.	Department of Education, Minneapolis
Macomb County Courthouse	Mt. Clemens, Mich.	Geo. J. Haas
U. S. Court and Customs House	Toledo, Ohio	U. S. Treasury Department
Aviation Building Addition	Fort Worth, Tex.	Wyatt C. Hedrick
Holy Angels Academy	Minneapolis, Minn.	John H. Wheeler
U. S. Post Office	Boston, Mass.	U. S. Treasury Department
Southwest Bell Telephone Building	San Antonio, Tex.	Southwest Bell Co.
Dentistry Building, University of Minnesota	Minneapolis, Minn.	C. H. Johnston
Fisher Building	Detroit, Mich.	Albert Kahn
Maccabees Building	Detroit, Mich.	Albert Kahn
Foshay Tower	Minneapolis, Minn.	Magney & Tusler
Medical Arts Building	Minneapolis, Minn.	Long & Thorshov, Inc.
Republic Bank Building	Dallas, Tex.	C. D. Hill Co.
Dallas National Bank	Dallas, Tex.	Smith & Evans
Ford Museum	Dearborn, Mich.	Robert O. Derrick, Inc.

ESTABLISHED 1911

ELLISON BRONZE COMPANY, INC.

Architectural and Decorative Products in Cast and Hollow Bronze and Aluminum

JAMESTOWN, N. Y.

REPRESENTATIVES IN:

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CHICAGO, ILL.
CLEVELAND, OHIO
DALLAS, TEX.
DENVER, COLO.
DETROIT, MICH.
KANSAS CITY, MO.
MINNEAPOLIS, MINN.
NASHVILLE, TENN.
PITTSBURGH, PA.
RICHMOND, VA.
ST. LOUIS, MO.
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SEATTLE, WASH.
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YORK, PA.
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NOWHERE EXCELLED

Products

ORNAMENTAL BRONZE and ALUMINUM WORK, which includes:

Architectural and Decorative Castings.
Bank Screens and Fitments.
Bulletin and Directory Cases.
Check Desks.
Doors and Entrances.
Elevator Fronts.
Grilles and Guards.
Hollow Bronze and Aluminum Doors and Partitions.
Letters and Figures.
Mausoleum Equipment.
Memorial Tablets and Plaques.
Seats.
Signs.
Store Fronts.
Ventilators.
Window Frames and Casements.
Special Hardware.

For our pages on Welded Bronze and Aluminum Doors, Balanced Doors and Louvre Ventilators, see Manufacturers' Index.

Equipment

Our equipment comprises a most complete establishment, devoted exclusively to the manufacture of bronze and aluminum products.

Facilities

These include designing, engineering and drafting departments, modeling and pattern departments for plaster, wood and metal patterns. We have also a completely equipped foundry, machine shop, chasing and finishing departments, and a special hardware department.

This complete organization, covering a lifetime of experience and personal supervision, offers expert engineering and drafting service requiring a minimum of supervision on the part of the architect.

References

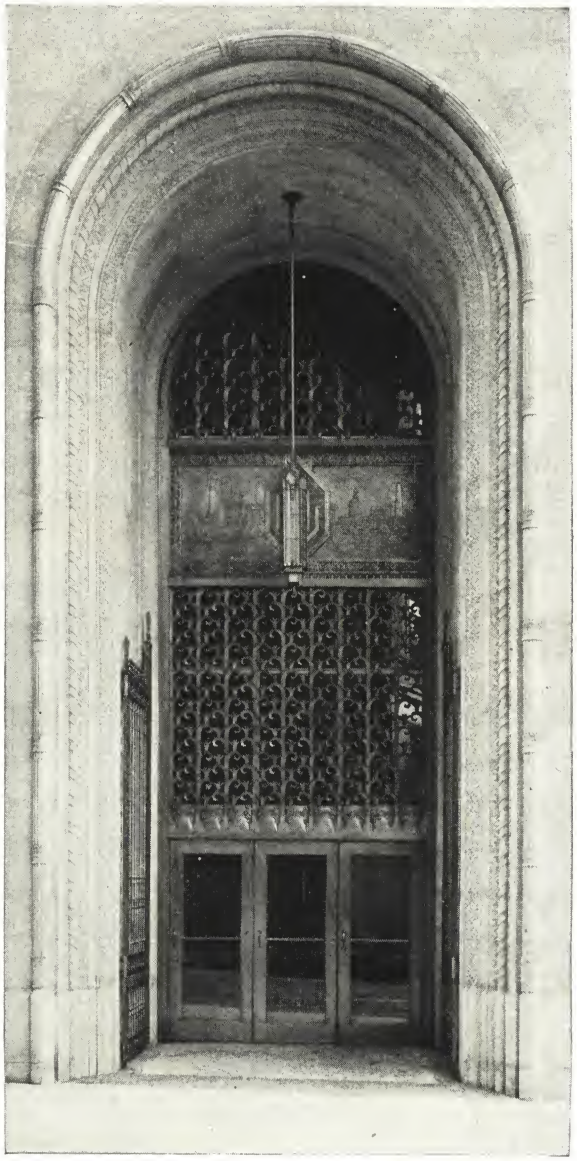
Any bank or banker in Jamestown, N. Y. Dun or Bradstreet Mercantile Agency, New York, N. Y.

Literature

Gladly mailed on application. Send for a list of our installations.

Typical Installation

The ornamental bronze required for the Baltimore Life Insurance Company Building, Baltimore, Md., included fourteen Ellison Welded Bronze Doors, three of which were used for the main entrance shown below.



Main Entrance Baltimore Life Insurance Company's Building, Baltimore, Md.
MOTTU & WHITE, Architects

ETCHED PRODUCTS CORP.

Manufacturers of Etched Panels

Queens Boulevard and 39th Street
LONG ISLAND CITY, N. Y.

BRANCH OFFICE: 1836 Euclid Avenue, CLEVELAND, OHIO

"Masters of the Etching Process"

The Company and Its Services

THE ETCHED PRODUCTS CORP. are manufacturing specialists of etched panels for elevator and corridor doors as well as hollow metal doors.

The Company is completely staffed to handle drawings, photographic work, etching and all finishing, including enameling and toned effects.

Flexibility of Panels

Panels are constructed flat for doors, or can be made satisfactorily to form the entire front by bending after etching. Etching can be done on formed as well as on flat sheets.

Etching

Panels can be etched in one piece in any size, thereby eliminating the old method of joining together several small sections.

Etching done on bronze, brass, Muntz metal, nickel silver, Benedict metal, steel and aluminum.

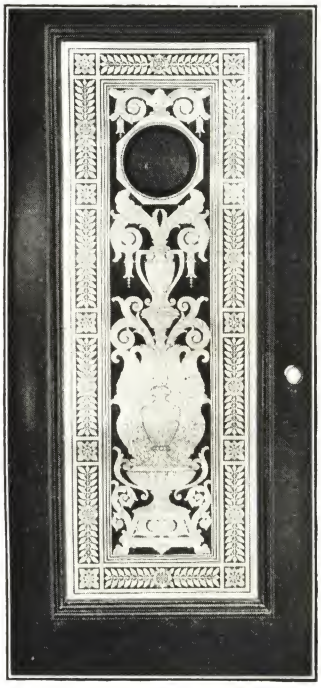
Advantages

Etched panels are outstanding due to their many uses, simplicity of installation and low cost.

The price and decorative effect of etched panel doors compare favorably with alternates.

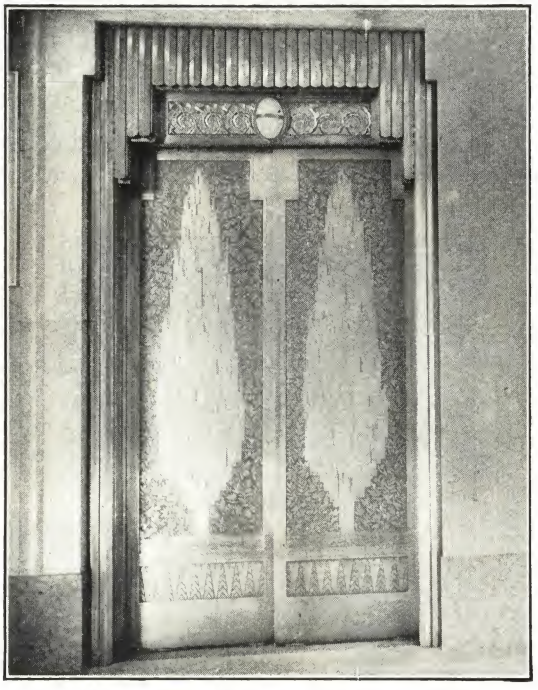
Designs and Samples

Write for complete information regarding stock designs. A miniature etched sample panel gladly furnished on request.



A Popular Stock Design

For apartment house elevators. Made either in oxidized bronze or stainless steel black enameled



No. 1 Cedar Street Building, New York, N. Y.
Three-toned effect on bronze

First National Bank, St. Paul, Minn.

Made of cold rolled steel, oxidized and buffed out to imitate Swedish hammer work

Partial List of Installations

Hollywood Theatre, New York, N. Y.
Montreal Trust Company, Montreal, Can.
1440 Broadway, New York, N. Y.
San Jacinto Hotel, Houston, Tex.
City-County Building, Buffalo, Ohio
Heidelberg Hotel, Jackson, Miss.
American Union Bank, New York, N. Y,
Tomsig Building, Perth Amboy, N. J.
Dallas Light & Power Company, Dallas, Tex.
White Chapel Mausoleum, Detroit, Mich.
United Fruit Piers, New York, N. Y.
Blakeslee Apartments, Detroit, Mich.
Fidelity Bank & Trust Co., Kansas City, Mo.
United Corporation Building, Atlanta, Ga.
Blyn Shoe Store, New York, N. Y.
First National Bank of Saint Paul, Saint Paul, Minn.
Larson Building, Yakima, Wash.
90 John Street Building, New York, N. Y.
Pellisier Building, Los Angeles, Calif.
McGeehee Hotel, Little Rock, Ark.
John & Gold Streets Building, New York, N. Y.
Blackstone Apartments, Milwaukee, Wis.
Mayflower Hotel, Akron, Ohio
Shanghai Power Company, Shanghai, China
444 Madison Avenue Building, New York, N. Y.
Lafayette Hotel, Marietta, Ohio
Moore Building, San Antonio, Tex.
99 Wall Street Building, New York, N. Y.
National Building, Toronto, Can.
Bacardi Building, Havana, Cuba
Worth Building, New York, N. Y.
Administration Building for the Board of Education, Philadelphia, Pa.
Dallas Gas Building, Dallas, Tex.
29 West 47th Street Building, New York, N. Y.
Five Points Building, Birmingham, Ala.
Administration Building, Edmonton, Alberta, Can.
Wm. Rockhill Nelson Gallery of Art and Atkins Museum of Fine Arts, Kansas City, Mo.
Star Building, Montreal, Can.
Beth Shalom Synagogue, Pittsburgh, Pa.
Cranberry & Henry Street Apartments, Brooklyn, N. Y.
Canadian National Railways, Saskatoon, Sask., Can.
National Breweries Office Building, Montreal, Can.
American Central Life Insurance Building, Indianapolis, Ind.
Boulevard Trust Company, Brookline, Mass.
Montgomery County Courthouse, Harristown, Pa.

FLORENTINE CRAFTSMEN, INC.

Artisans in Ornamental Hand Wrought Metals

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NEW YORK, N. Y.

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HAND WROUGHT IRON and BRONZE for every Interior and Exterior Purpose. We create distinctive designs and reproduce all periods in Ornamental Hardware, Drapery Ornaments and Fixtures.

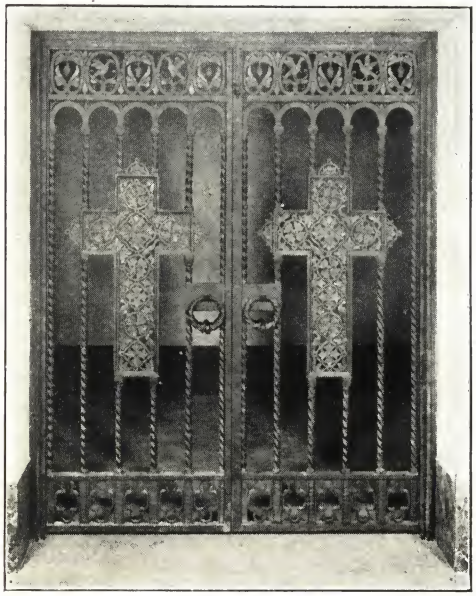
We also offer a complete line of Fireplace Fitments, Metal Furniture for Gardens and Interiors, Weathervanes, Radiator Enclosures and Metal Craft in general.

Facilities and Service

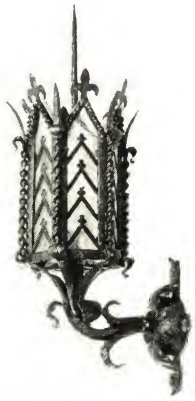
We welcome the inquiries of architects and contractors seeking a satisfactory solution to their decorative metal problems. We offer a wealth of experience gained in more than 26 years of artistry in the creation and manufacture of distinctive hand wrought iron and bronze work. Our studio and shop facilities can meet the most exacting demands.

Details of Hand Wrought Iron Gates, Shown at Left Below, for Marymount College, Tarrytown, N. Y.
ARTHUR WARE, Architect

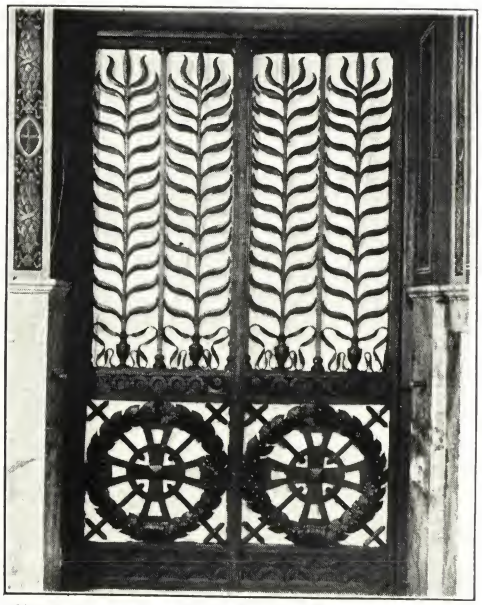
Radiator Enclosure in Repoussé Work for Private Residence
Designed by V. A. R. PRIMAVERA



Hand Wrought Iron Gates for Marymount College, Tarrytown, N. Y.
Details of which are shown above
ARTHUR WARE, Architect



Hand Forged Lantern for the Guild Theatre, New York, N. Y.

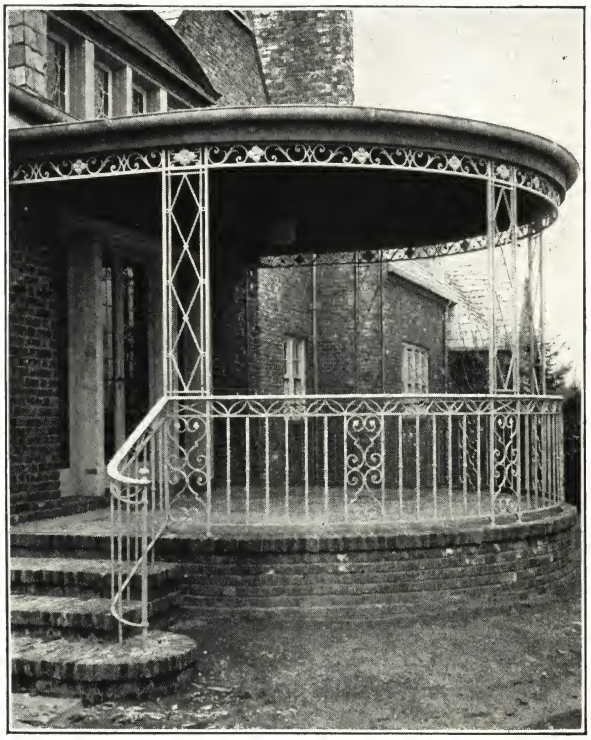


Hand Forged Iron Door for the Crypt, St. James Pro-Cathedral, Brooklyn, N. Y.
GUSTAVE STEINBACH, Architect

Hand Forged Iron Stair Railing for the Residence of Michael A. Paterno, Irvington-on-the-Hudson, N. Y.
ROSARIO CANDELA, Architect

Hand Wrought Stair Railing of Swedish Iron, Half-polished Finish, Installed Recently in a Long Island (N. Y.) Mansion

Wrought Iron Gates for the Gardens of Nathan Jonas, Great Neck, Long Island, N. Y.
JAMES R. THOMSON, Architect



Porch Railing, Residence of Nathan Jonas, Great Neck, Long Island, N. Y.
MANN & MCNEILLE, Architects JAMES R. THOMSON, Associate

GENERAL BRONZE CORPORATION

Distinctive Metal Work

LONG ISLAND CITY, N. Y.

WESTERN SALES OFFICE: 27th Avenue and 27th Street, So., MINNEAPOLIS, MINN.

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TIFFANY-CORONA BRONZE & IRON PLANT
RENAISSANCE BRONZE & IRON PLANT
ROMAN BRONZE WORKS STATUARY FOUNDRY
FLOUR CITY ORNAMENTAL IRON PLANT
WISCONSIN ORNAMENTAL BRONZE PLANT
GUARANTY IRON & STEEL PLANT
DOMINION BRONZE & IRON PLANT

Products

All types of ARCHITECTURAL ORNAMENTAL METAL in aluminum, bronze, iron, monel, nickel.

SCULPTURAL CASTING in either the lost wax or French sand process.

A partial list of products includes:

Balustrades	Grilles
Bank Screens	Lamp Standards
Check Desks	Marquises
Counter Screens	Mausoleum Doors
Directory Boards	Railings
Doors	Signs
Elevator Doors	Spandrels
Entrances	Store Fronts
Gates	Tablets

For Casement and "Polachek" Patented Double Hung Windows, see Manufacturers' Index, or write for catalogue.

Experience

For thirty-eight years, General Bronze, through its predecessor companies, has been working in architectural ornamental metals. We have acquired a wealth of experience in the manufacture of the finest work.

Pioneer Woman
Located in Prairie Park, Ponca City, Okla.
BRYANT BAKER, Sculptor

Improvements

While retaining all the good points of the traditional methods of bronze working, we have inaugurated improvements in casting and finishing. On the newer metals we are working in close contact with the producers, seeking the very best alloys and methods of handling for each and every type of product.

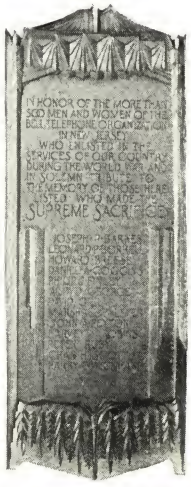
Engineering Service

We want architects to take advantage of our experience and research. It may be that on the engineering problems involved in presenting designs to the best advantage that we can offer suggestions making for lower costs and even better quality.

This service is available without obligation by personal service from either our New York or Minneapolis offices.

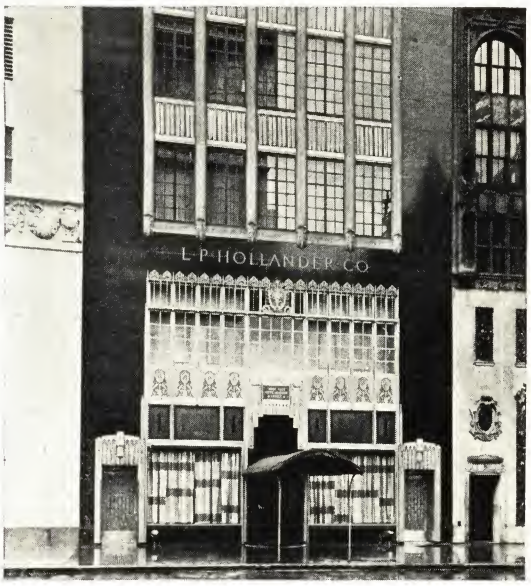
Cast Bronze Tablet

Detail of Bronze Exterior Entrance Doors and Clock, East New York Savings Bank, Brooklyn, N. Y.
HOLMES & WINSLOW, Architects

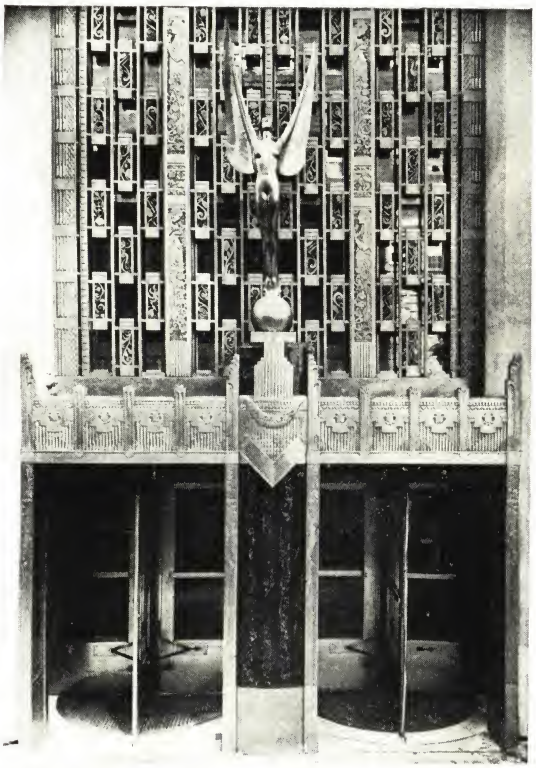


Cast Bronze Tablet

Aluminum Transom Panel with Copper, Brass and Bronze Inlay for Main Entrance of Goelet Building, New York, N. Y.
E. H. Faile & Co., Engineers



Aluminum Entrance of the L. P. Hollander Co. Store, New York, N. Y.
Shreve, Lamb & Harmon, Architects



Nickel Silver Main Entrance of Waldorf Astoria Hotel, New York, N. Y.
Schultze & Weaver, Architects

Iron Grille, Cleveland Federal Reserve Bank, Cleveland, Ohio
Walker & Weeks, Architects

ESTABLISHED 1831

THE GORHAM COMPANY

BRONZE DIVISION

Fine Architectural Metal Work, Designers of Tablets and Memorials Statuary Founders

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Counterscreens
Directories
Doors (All Tyes)
Ecclesiastical Wares
Elevator Enclosures
Elevator Doors
Flagpole Bases
Front Work
Gates
Grilles
Guards (Window)
Lamps
Lamp Standards
Lanterns
Lecterns
Letters
Marquise
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Tablets
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Executed in bronze, brass, nickel bronze, aluminum, monel, stainless steel, silver and gold. Installations of any size.

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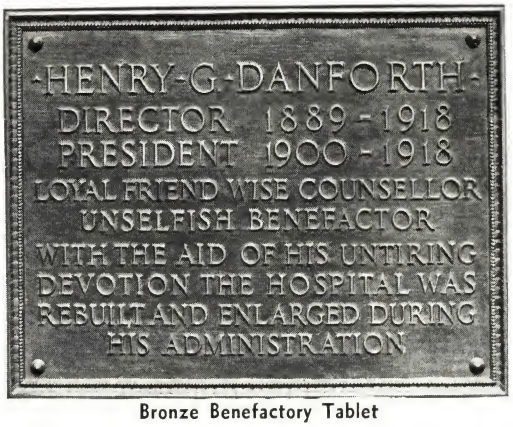
Complete installations for mausoleums of any size. Wide variety of designs and patterns for bronze doors and other equipment.

Bronze Trophy Tablet

Statuary Castings and Bronze Memorials

We produce the finest quality bronze castings by either the French Sand or Cire Perdue (lost wax) processes.



Bronze Benefactory Tablet

Bronze Commemorative Tablet

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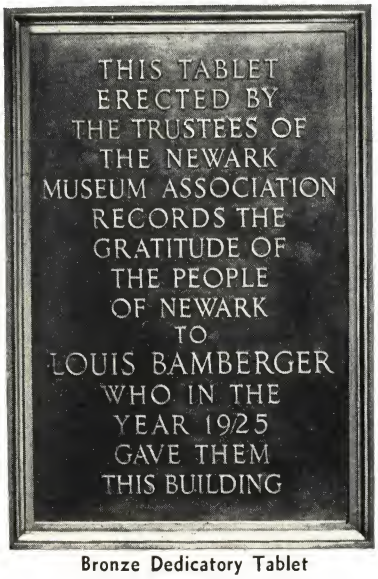
A complete service, based on a half-century of experience in designing and casting fine memorials and tablets in bronze. The book of Gorham Bronze Tablets and Memorials, containing information helpful to designers, will be sent upon request. Whether for historical, dedicatory or memorial purposes, our large library of designs and patterns affords an opportunity to procure distinctive tablets appropriate for every need at moderate cost.



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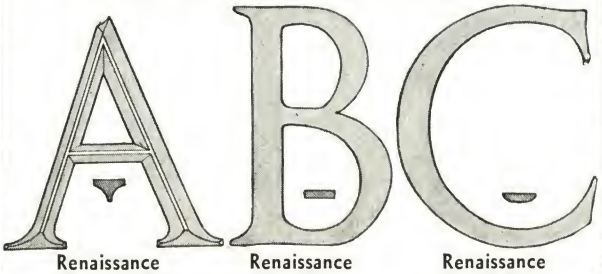
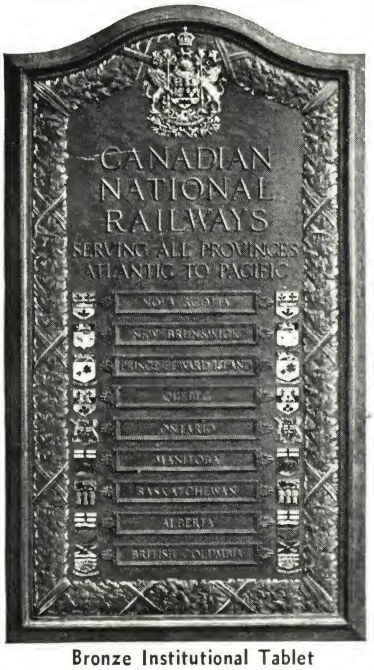
Bronze Letters

Gorham Letters reflect the best traditions in letter design and are expertly finished to true form and contour. Our library includes all standard forms and sizes as well as a wide variety of special letters. All letters furnished with suitable mounting pins.

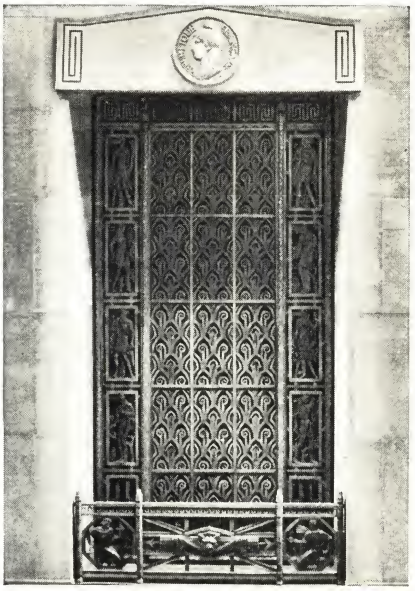


Renaissance Concave V | Renaissance Flat Face | Renaissance Round Face



Bronze Institutional Tablet

Bronze Grille, White Chapel Mausoleum, Detroit, Mich.
ALVIN E. HARLEY, Architect

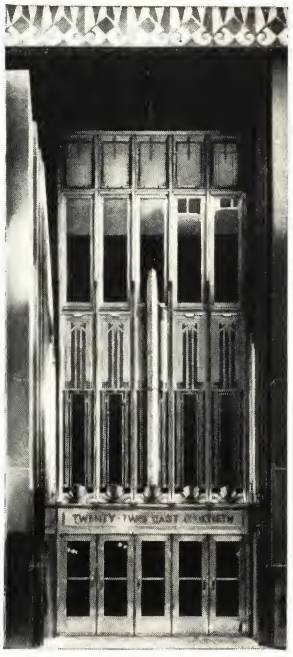


Left: **Benedict Nickel Check Desk, Canadian Bank of Commerce, New York**
Right: **Bronze and Nickel Grille, City Bank-Farmers' Trust Co., New York**
Both of Above by CROSS & CROSS, Architects

Cast Bronze Doors, American Academy of Arts and Letters, N. Y.
HERBERT ADAMS, Sculptor

Gorham Architectural Metal Work Recently Installed

Westinghouse Memorial, Pittsburgh, Pa.
Henry Hornbostel, Architect
Daniel Chester French, Sculptor
John Wanamaker Building, Philadelphia, Pa.
John T. Windrim, Architect
Aetna Life Insurance Co., Hartford, Conn.
James Gamble Rogers, Architect
Gulf Building, Houston, Tex.
Kenneth Franzheim, Architect
City Bank-Farmers Trust Co., New York, N. Y.
Cross & Cross, Architects
National Newark & Essex Bank, Newark, N. J.
John H. & Wilson C. Ely, Architects
Board of Trade Building, Chicago, Ill.
Holabird & Root, Architects
Lincoln Building, New York, N. Y.
J. E. R. Carpenter, Architect
Holland Tunnel, New York and New Jersey
Harvey Wiley Corbett, Architect
White Chapel Mausoleum, Detroit, Mich.
Alvin E. Harley, Architect
Nelson Gallery of Art, Kansas City, Mo.
Wight & Wight, Architects
Onondaga County Savings Bank, Syracuse, N. Y.
Halsey, McCormack and Helmer, Inc., Architects



Aluminum and Benedict Nickel, 22 E. 40th Street Building, N. Y.
KENNETH FRANZHEIM, Architect

Bronze Altar Gates, St. Patrick's Cathedral, New York
ROBERT J. REILLY, Architect

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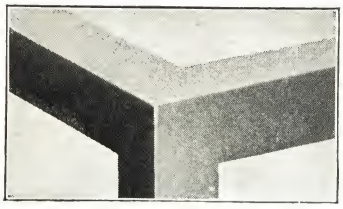
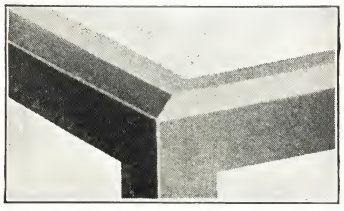
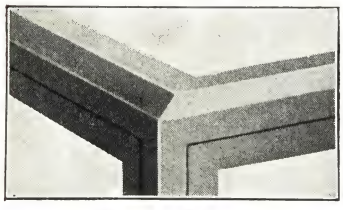


Moderne-Ogden
Extruded moulding



Moderne-Talman
Extruded moulding



Moderne-Carmen
Extruded moulding

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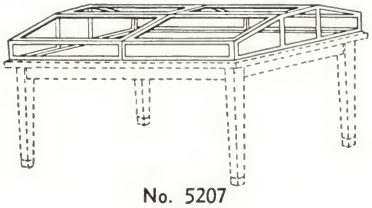
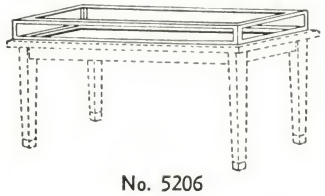
"Garcy" metal frame display cases (furnished complete, except for wood and glass) combine beauty and durability in the highest degree. Thirty-three years of close co-operation with department stores, specialty shops, museums, fixture manufacturers and equipment designers, in producing display case hardware and frames, has made our line of this material extensive and complete.



No. 5207



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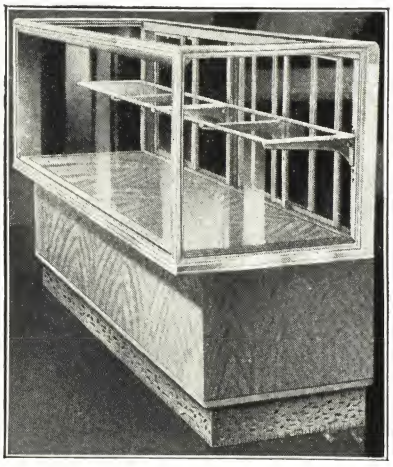
Architectural Metal Work

We specialize in producing architectural metal work of every description in extruded, rolled, cast or wrought metal.



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With metal frame glass doors sliding on rollers and track. Metal frame glass shelves with keyhole standards and adjustable brackets. Reflector to illuminate interior of case.

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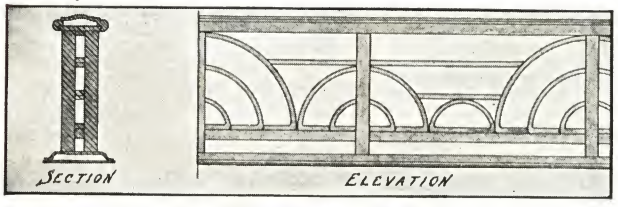
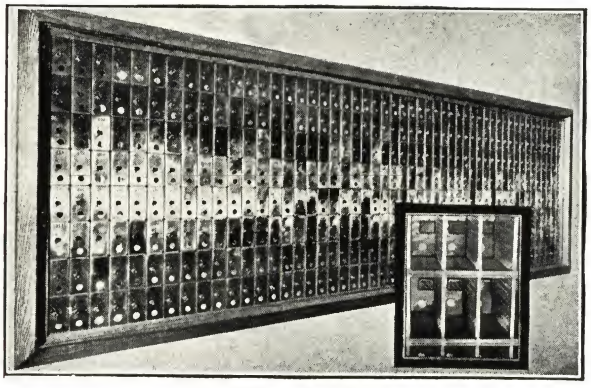
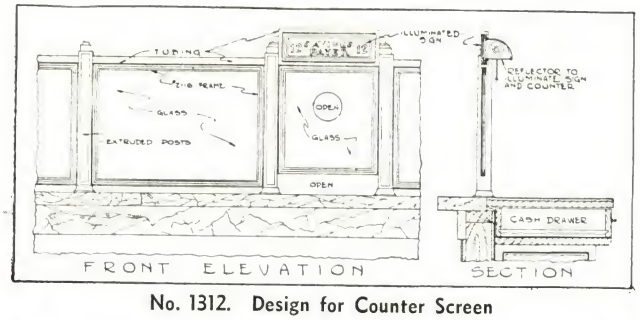


No. 1420. Design for Railing



No. 1424. Mail Boxes
For hotels, hospitals, schools, etc. Inset shows open rear end of boxes



No. 1312. Design for Counter Screen

No. 1433. Hand Hammered Ventilating Grilles

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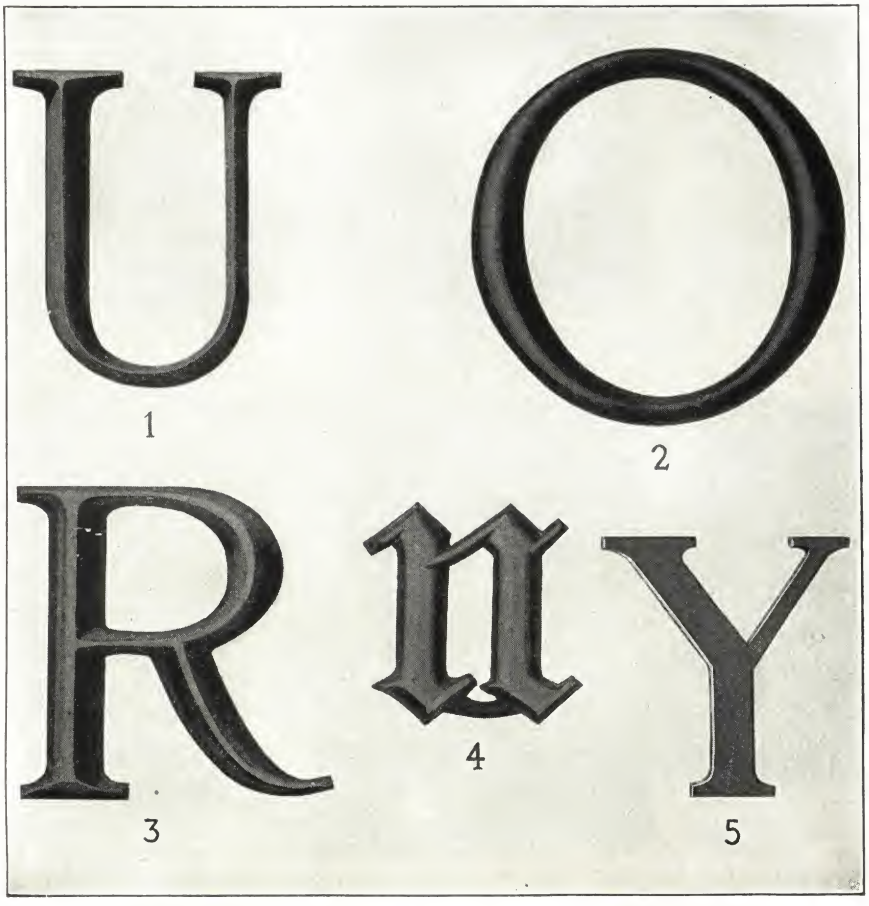
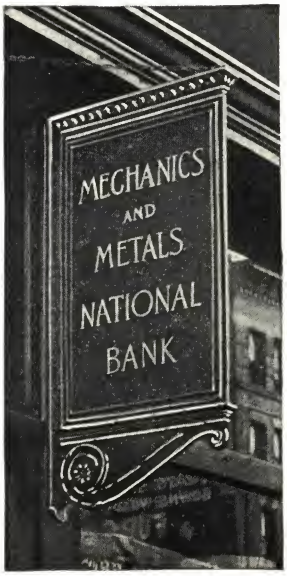
We also make Antivision window screens and do gold lettering on glass.

Estimates or drawings gladly furnished on request.



(1) Bevel Face (4) Old English Face (2) Round Face
(3) Cove Face (5) Flat Face

Five Types of Bronze Letters in Sizes ½ to 30 In.



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Architectural Bronze, Aluminum Monel, and Iron Work of every description.

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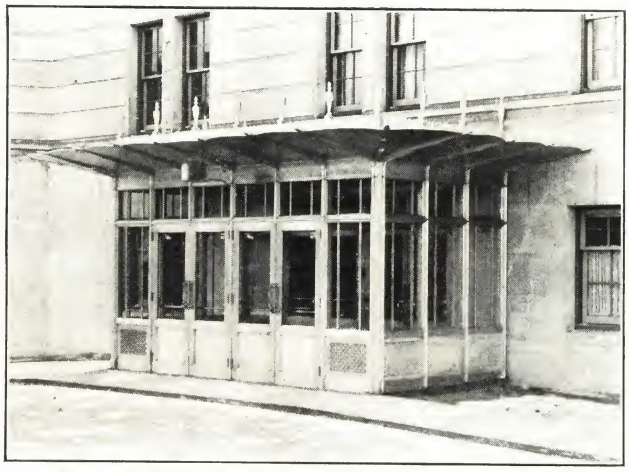
Our prices are not the lowest but our product is equal to the best.

Competent drafting, designing and estimating departments are always available.

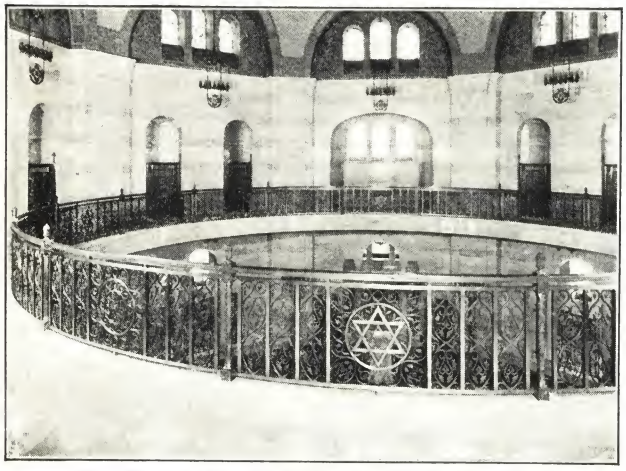
Recent Installations

Building and Location	Architect
Strouss-Hirschberg Dept. Store, Youngstown, Ohio	Starrett & Van Vleck
Union Trust Co., Cleveland, Ohio	L. Kent Moatz
Broad Street Trust Co., Philadelphia, Pa.	Ritter & Shay
Public Auditorium Building, Cleveland, Ohio	Herman Kregelius
Tuberculosis Hospital, Cleveland, Ohio	Herman Kregelius
Farmers Bank, Mansfield, Ohio	Althouse & Jones
First National Bank of New Castle, New Castle, Pa.	Simons, Brittain & English, Inc.
Richland Savings Bank, Mansfield, Ohio	Althouse & Jones
Institute of Pathology, Cleveland, Ohio	Abram Garfield
Gallery of Fine Arts, Columbus, Ohio	Richard, McCarty & Bulford
Dollar Savings Bank, Wheeling, W. Va.	Albert Kahn
Cuyahoga County Jail and Courthouse, Cleveland, Ohio	Warner & Mitchell
Wheeling Hospital, Wheeling, W. Va.	Crowe, Lewis & Wick
Abraham Lincoln Hotel, Reading, Pa.	W. L. Stoddart
Detroit Stock Exchange Bldg., Detroit, Mich.	O'Dell & Diehl
Mayfield Mausoleum, Cleveland, Ohio	Lovell & Lovell
Akron Central Tower Building, Akron, Ohio	Walker & Weeks
Allen Memorial Med. Library, Cleveland, Ohio	Walker & Weeks
Central United National Bank, Cleveland, Ohio	Walker & Weeks
Colonial Arcade Building, Cleveland, Ohio	Walker & Weeks
Federal Reserve Bank, Pittsburgh, Pa.	Walker & Weeks
First Church of Christ Scientist, Cleveland, Ohio	Walker & Weeks
Severance Music Hall, Cleveland, Ohio	Walker & Weeks

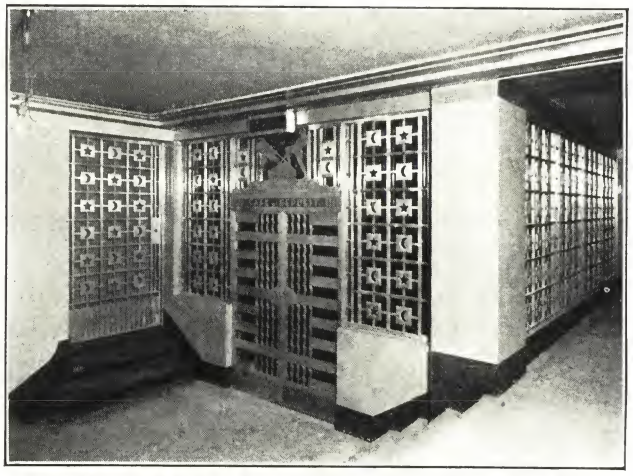


Cast and Wrought Aluminum Vestibule, Severance Hall, Cleveland, Ohio
Walker & Weeks, Architects

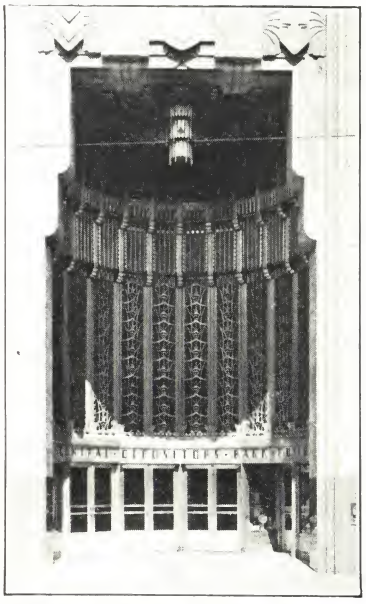
Cast Bronze Safety Deposit Grille, Richland Savings Bank, Mansfield, Ohio
Althouse & Jones, Architects



Cast Bronze Rotunda Railing, Mayfield Mausoleum, Cleveland, Ohio
Lovell & Lovell, Architects

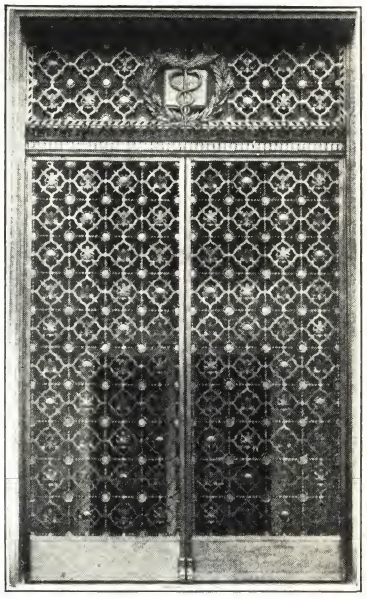


Cast Aluminum Safety Deposit Grille, Central Depositors Bank, Akron, Ohio
Walker & Weeks, Architects

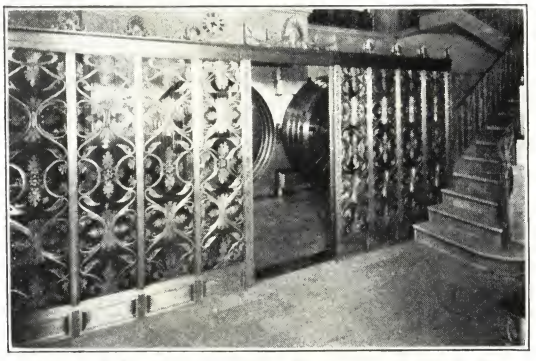


Cast and Wrought Aluminum Entrance,
Central Depositors Bank, Akron, Ohio
WALKER & WEEKS, Architects

Cast Aluminum Front
ROWLAND JOHNSON, Architect



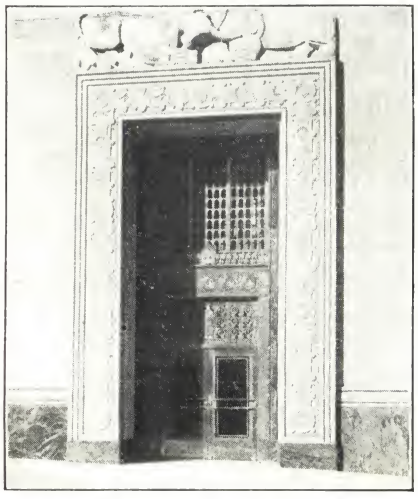
Cast Bronze Grille Door, Institute of
Pathology, Cleveland, Ohio
ABRAM GARFIELD, Architect



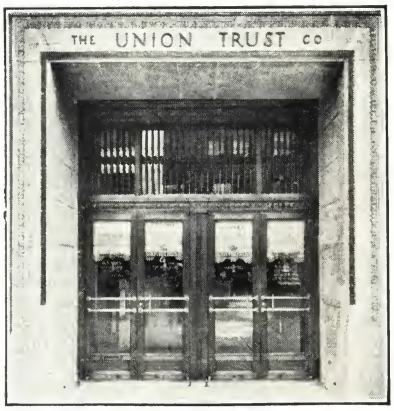
Bronze Safe Deposit Grille, Broad Street Trust Co..
Philadelphia, Pa.
RITTER & SHAY, Architects

Left:
Cast Bronze Entrance Doors, United Artists Building,
Detroit, Mich.
HOWARD CRANE, Architect

Right:
Cast Bronze Entrance—Extruded Bronze Doors, Gallery
of Fine Arts, Columbus, Ohio
RICHARDS, MCCARTY & BULFORD, Architects



Cast Bronze Entrance, Detroit Stock Exchange
O'DELL & DIEHL, Architects



Bronze Entrance, Union Trust Co.,
Cleveland, Ohio
L. KENT MOATZ, Architect

Cast Bronze Grille Door, Severance Hall,
Cleveland, Ohio
WALKER & WEEKS, Architects

J. S. HEATH COMPANY

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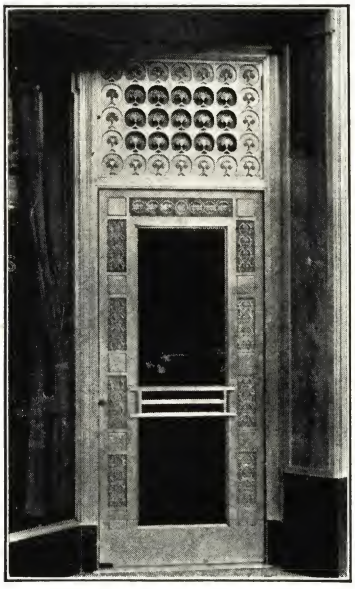
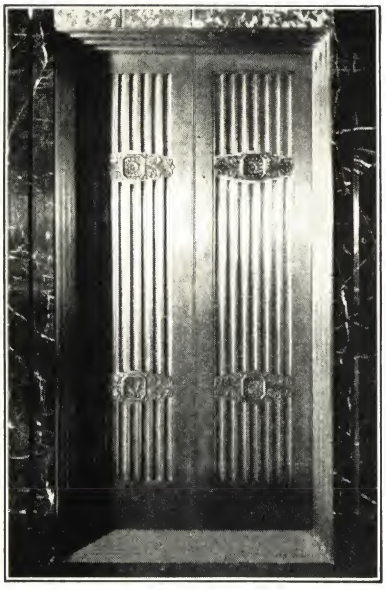
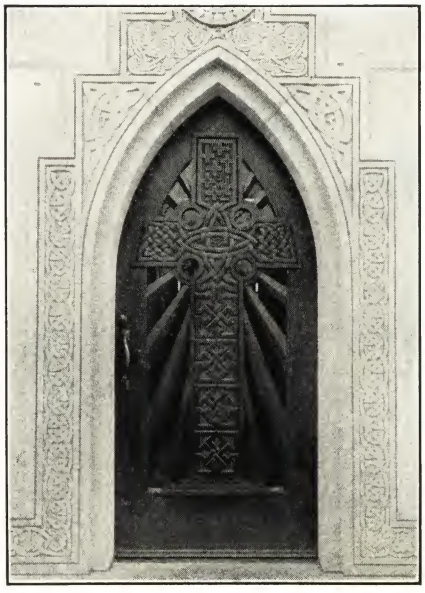


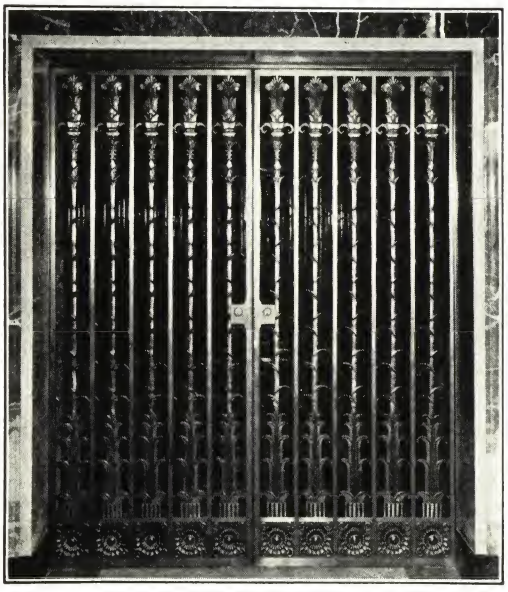
Cast Aluminum Entrance
Kline Building, Evanston, Ill.
MAHER & MCGREW, Architects,
Evanston, Ill.



Elevator Entrance
Tower Petroleum Building, Dallas, Tex.
MARK LEMMON, Architect
HENGERS & CHAMBERS CO., Contractors



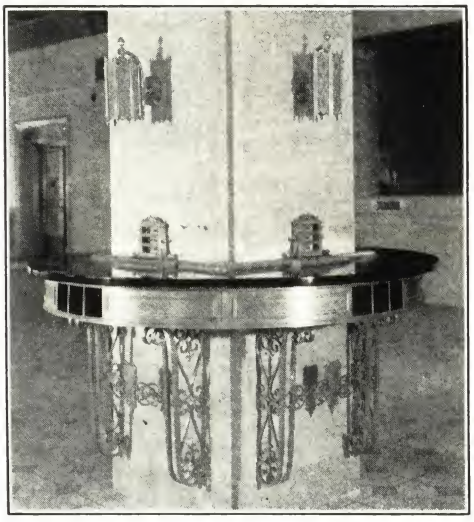
Private Mausoleum Door,
Chas. G. Blake Co., Chicago, Ill.
Memorial Designers and Builders



Cast and Wrought Bronze Gates to Sarcophagus Chamber
Lincoln Tomb, Springfield, Ill.
HERRICK HAMMOND, Supervising Architect

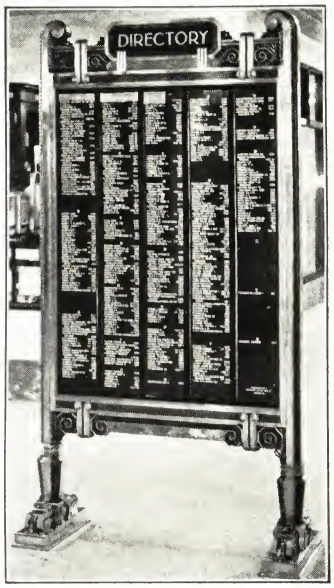
Left:
Wrought Aluminum Entrance, Highland Park, Ill.
WM. D. MANN, Architect

Right:
Entrance, Racine City Hall, Racine, Wis.
J. MANDOR MATSON, Architect

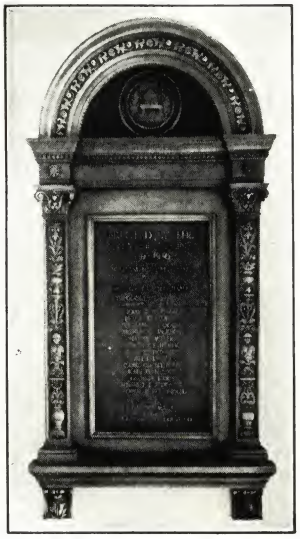


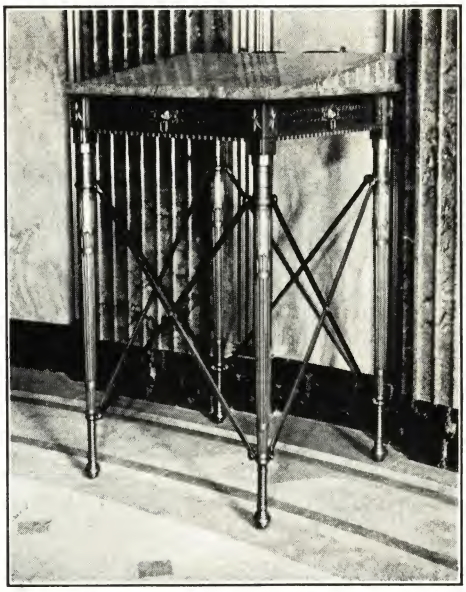
Bronze Check Desk,
Ohio Power Company, Canton, Ohio
VERNON REDDING & ASSOCIATES, Architects

American Trust & Banking Co., Chattanooga, Tenn.
K. M. VITZTHUM & Co., Architects



Cast Bronze Building Directory
Engineering Building, Chicago, Ill.
BURNHAM BROTHERS, Architects





Cast Bronze and Marble
Registration Desk
Lincoln Tomb, Springfield, Ill.

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Bronze Entrance Doors, Frames and Grilles
Mausoleum Doors and Equipment
Bronze Window Sash
Cast Bronze Letters and Tablets
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We specialize in bronze doors for bank and office buildings and mausoleums. (See illustrations.) Contracts taken in all parts of the United States which can be handled in the most efficient manner in our modern plant.

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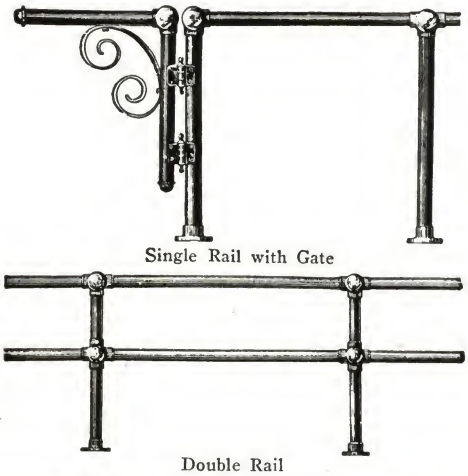
We have many different designs. Write for catalogue

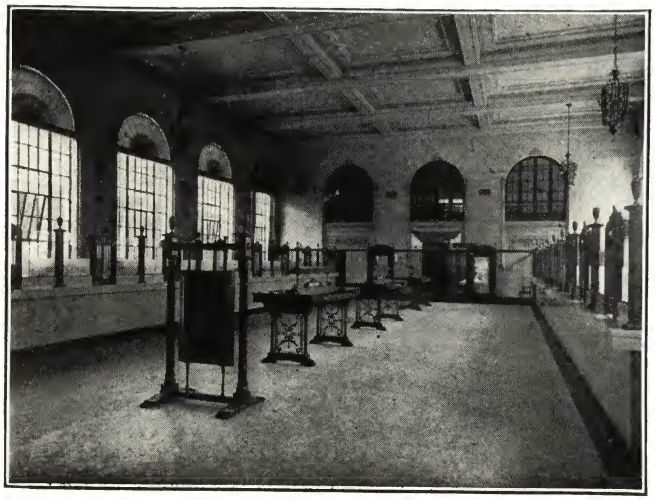
Bronze Tubing Door
Standard stiles 1½x3 in. and 2x3 in.



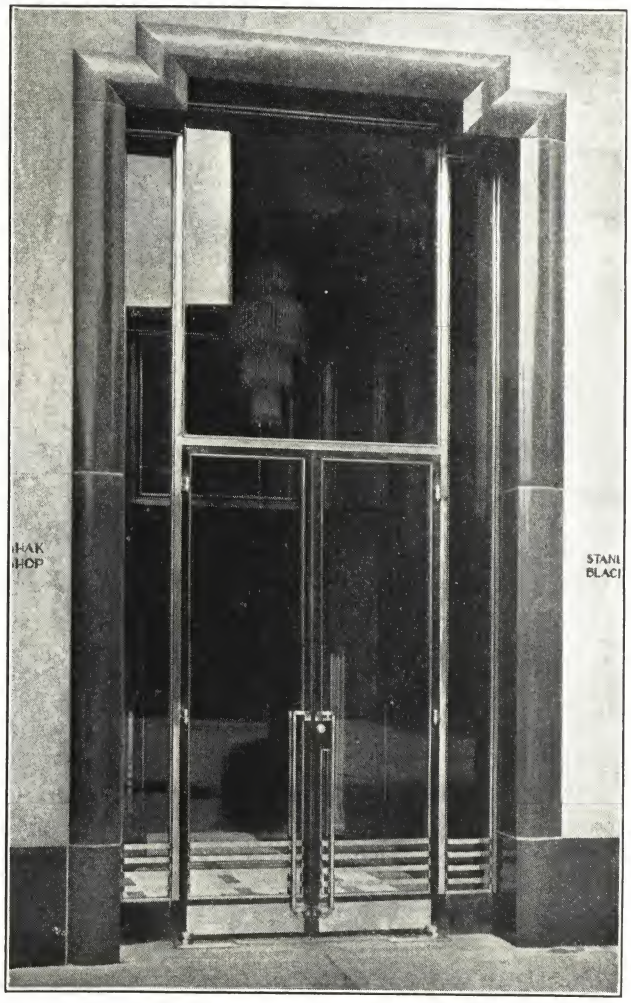
Single Rail with Gate

Double Rail

Brass, Bronze, White Metal and Chromium Plated Railings
For all purposes. Usually made of 2, 2½ or 3-in. tubing. Can also be furnished in iron



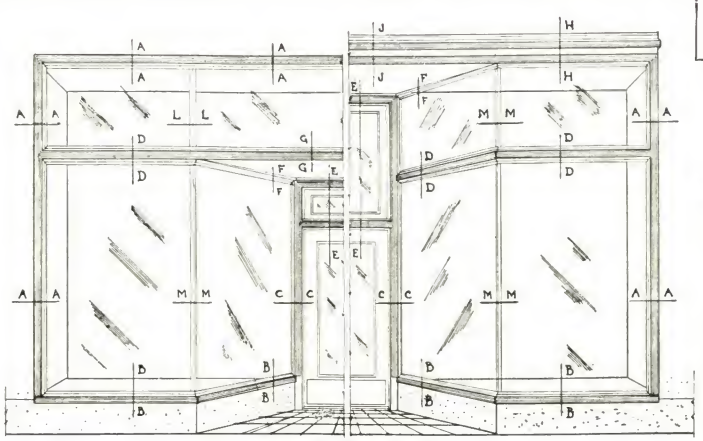
Des Plaines State Bank Building, Des Plaines, Ill.
Bank interiors of bronze, white metal and iron



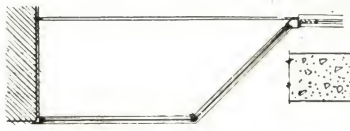
Blackstone Shop, Chicago, Ill.
Modern entrance of black and white treatment

EXTRUDED BRONZE OR WHITE METAL STORE FRONTS SHOWING METHOD OF CONSTRUCTION

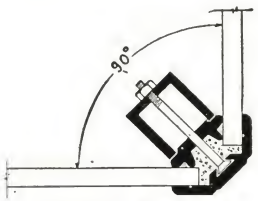
Note: Sections not less than ⅛" thick. Many other designs available. Ask for full sized details.
Glass stops are fastened from inside of glass. No screws are visible from outside.



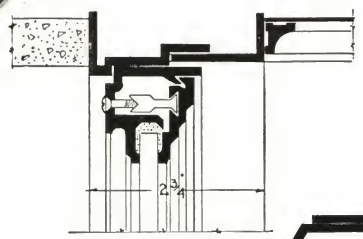
TYPICAL ELEVATION



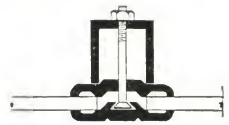
TYPICAL PLAN



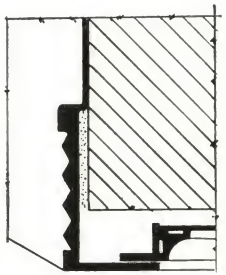
CORNER BAR FOR
90° RETURN



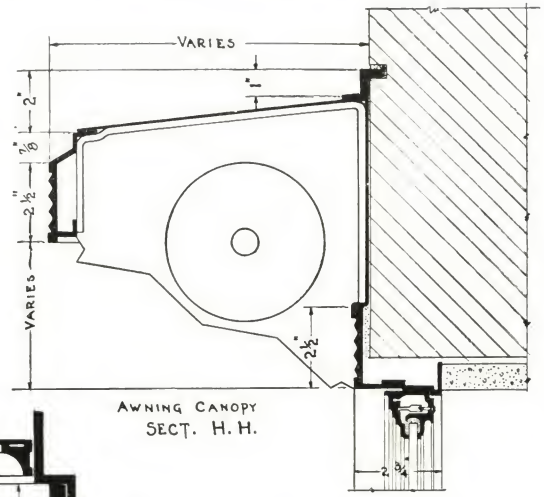
HEAD OF ENTRANCE
SIDE LIGTHS
SECT. F.F



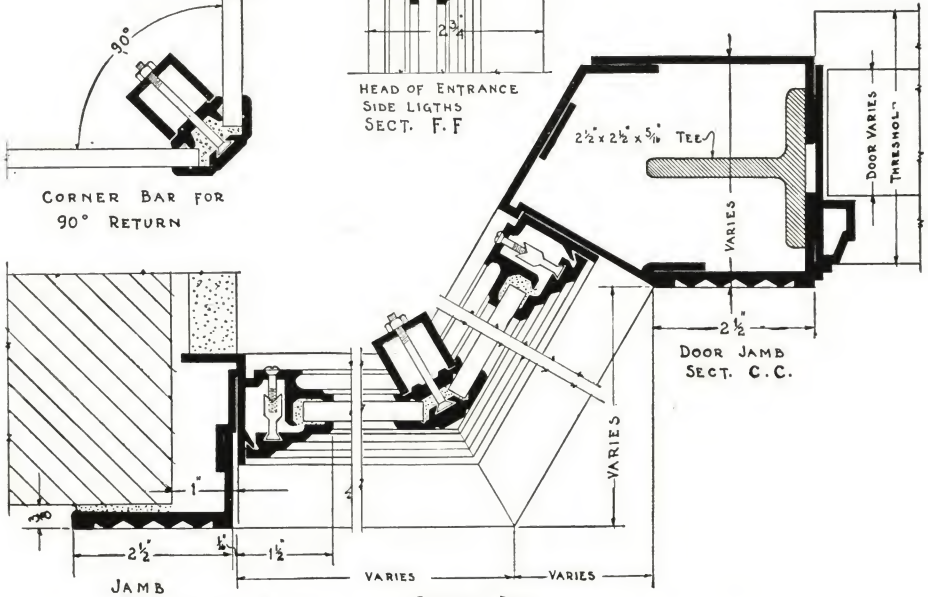
DIVIDING BAR
SECT. L.L



CANOPY OVER ENTR.
SECT. J.J.



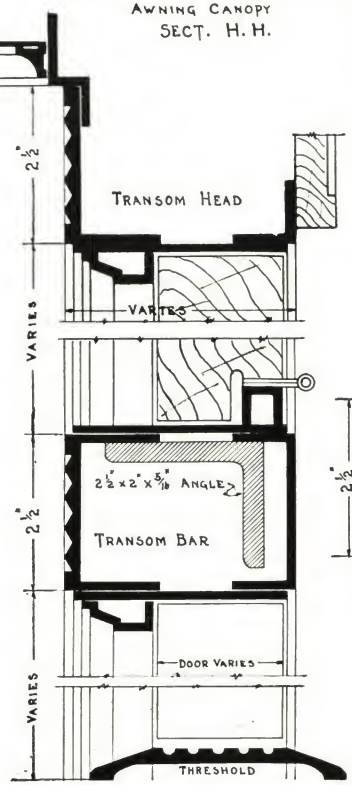
AWNING CANOPY
SECT. H.H.



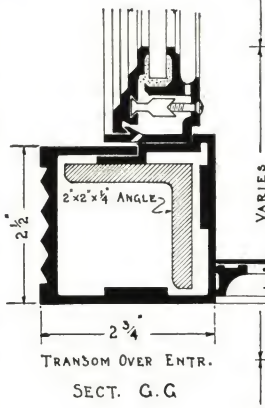
JAMB
SECT. A.A

DOOR JAMB
SECT. C.C.

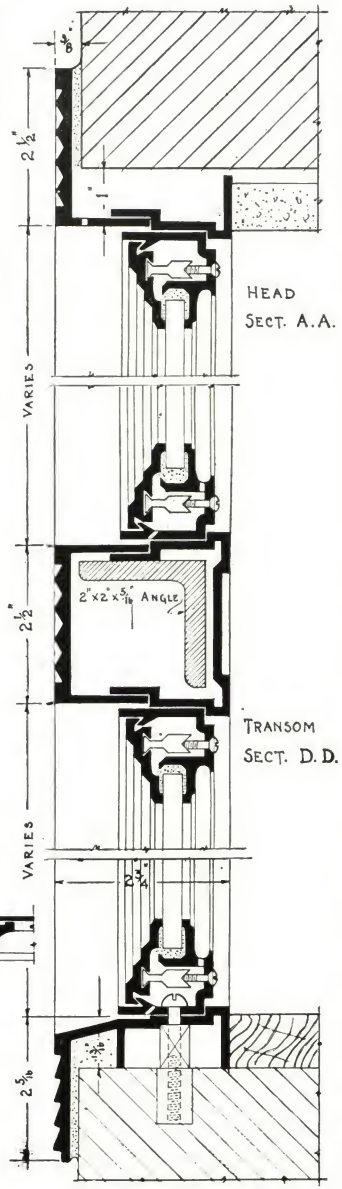
CORNER BAR
SECT. M.M.



SECT. E.E.



TRANSOM OVER ENTR.
SECT. G.G



HEAD
SECT. A.A.

TRANSOM
SECT. D.D.

BASE
SECT. B.B.

ILLINOIS BRONZE & IRON WORKS

A1183

THE INTERNATIONAL NICKEL COMPANY, INC.

Monel Metal and Nickel and Allied Products

EXECUTIVE OFFICES
67 Wall Street
NEW YORK, N. Y.

MINES AND SMELTER: Copper Cliff, Ont., Canada
ROLLING MILL AND REFINERY: Huntington, W. Va.
REFINERY: Port Colborne, Ont., Canada
FOUNDRY: Bayonne, N. J.

For Our Other Products, see Manufacturers' Index

For Distributers, see our page on Metals

Products

MONEL METAL for architectural uses is available in the mill forms of sheets, rods, tubes, angles, strips, wire, castings and in many fabricated forms such as kalamein and rolled mouldings, rivets, nails, screws, bolts, etc.

INCO MONEL METAL TRADE-MARK

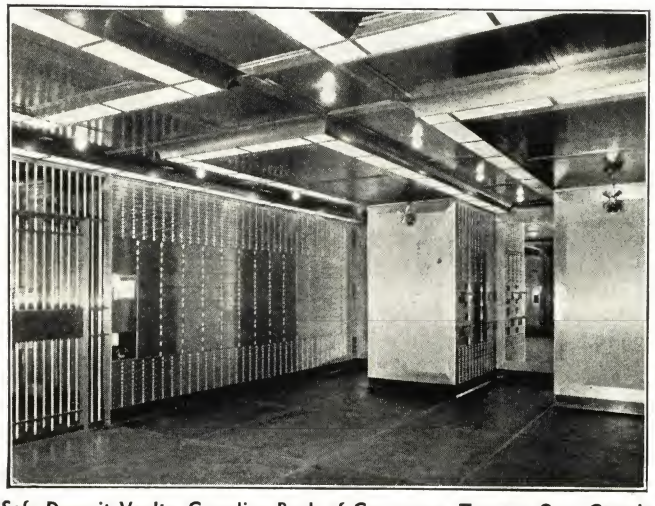
Monel Metal

Monel Metal is a registered trade-mark applied to a technically controlled nickel-copper alloy of high nickel content.

Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

Advantages of Monel Metal in Ornamental Work

(1) Absolutely rustproof.
(2) Resists corrosion.
(3) Strong as steel; tougher than steel.
(4) Easy to clean.
(5) Beautiful in appearance; has color of platinum.
(6) Durable; proven by over 20 years of service.
(7) Easily fabricated.



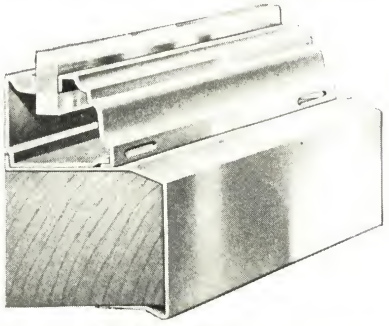
Safe Deposit Vaults, Canadian Bank of Commerce, Toronto, Ont., Canada
DARLING & PEASON, Toronto, Architect
All Monel Metal construction throughout.
Executed by the GOLDIE & MCCULLOUGH CO., LTD., and J. & J. TAYLOR, LTD., Toronto

Color of Monel Metal

As Monel Metal contains two-thirds nickel and one-third copper it is essentially a white metal.

Variety of Finishes

Various surface treatments are applied to Monel Metal. The metal may be brightly polished to a mirror finish, or different satin finishes are obtained by grinding. Duller effects are secured; such as light grays resembling pewter in appearance. If oxidized by high temperature or chemical treatment a deep black surface is obtained.



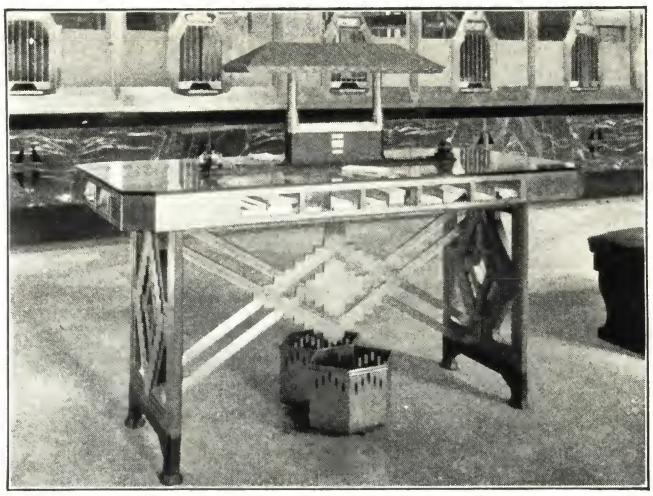
Standard Store Front Construction in Monel Metal
Supplied by BRASCO MFG. CO., Harvey, Ill.

Permanence of Monel Metal

Monel Metal is exceptionally resistant to corrosion and will resist deterioration for many times the life of the structure to which it is applied. If exposed to atmosphere, Monel Metal will in time be darkened due to accumulation of dirt and surface tarnish. This discoloration is on the surface only; corrosive action is retarded. The virtue of Monel Metal for architectural uses lies in the fact that its original appearance is retained permanently with proper care.

Wrought Monel Metal

Monel Metal may be forged and is used for the execution of hardware, gates, grilles and other wrought metal work, insuring permanence of the design and craftsmanship. At forging temperature Monel Metal accumulates a thin tight black oxide coating. By grinding high lights of work a two-toned effect is secured which closely resembles wrought iron in appearance.



Check Desks and Counter Screens in the Banking Rooms of the Union Trust Building, Detroit, Mich.

SMITH, HINCHMAN & GRYLLS, Architects
Executed in Monel Metal by THE GORHAM COMPANY

Monel Metal Hand Rails and Stair Trim Made from Monel Metal Strips and Rods

ROSS & MACDONALD, Montreal, Que., Canada, Architects
Executed by ARCHITECTURAL BRONZE & IRON WORKS, Toronto, Ont., Canada

Fabrication

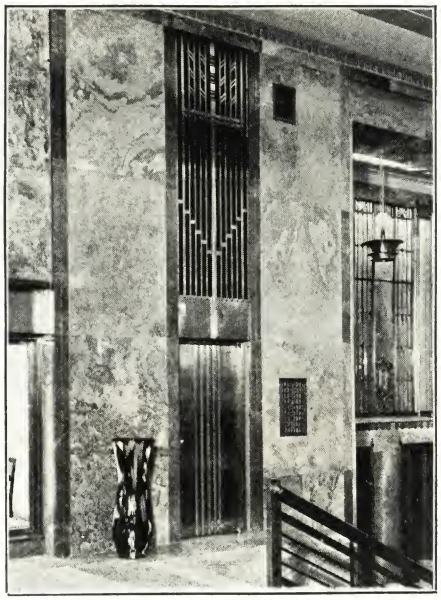
Monel Metal is readily worked and may be subjected to most fabricating operations. Monel Metal may be machined, forged, etched, welded, soldered, brazed, spun, stamped and drawn.

Architectural castings may be produced in any bronze foundry equipped with proper furnace facilities for attaining the high temperature necessary to melt Monel Metal. Being excessively strong and tough, Monel Metal cannot be extruded. Rolled and drawn shapes are produced. The working properties of Monel Metal permit any properly equipped iron or bronze shop to satisfactorily execute the architects' design.

Modern Architectural Uses

The execution of modern design is associated with white metal.

The increased use of color in architecture necessitates that the metal work be in harmony with the surroundings. The whiteness of Monel Metal is particularly suited for the execution of metal work of modern design. It can also be used effectively in combination with bronze to obtain color contrasts.



Monel Metal Door and Grille, T. Eaton Store, Toronto, Ont., Canada

ROSS & MACDONALD, Montreal, Que., Canada, Architects
Executed by ARCHITECTURAL BRONZE & IRON WORKS, Toronto, Ont., Canada

Some Suitable Uses of Monel Metal

Balustrades	Hardware
Bank fixtures	Lamp standards
Check desks	Lighting fixtures
Counter screens	Marquises
Display window trim	Memorials
Doors	Ornamental fences
Entrances	Pilasters
Etched panels	Radiator covers
Flagpole fittings	Safe deposit vault trim
Furniture	Showcases
Gates	Stair railings
Grilles	Store fronts
	Wrought rails

Working Instructions

A complete set of instructions in the form of bulletins recommending methods of working Monel Metal in such operations as machining, forging, casting, welding, soldering, brazing, drawing, stamping and polishing are available and will be forwarded on request.

Door Wrought Entirely of Monel Metal

"Practical Design in Monel Metal"

A 72-page book prepared for architects and metal craftsmen, containing information on design and fabrication augmented with working drawings of actual installations, will be sent upon request.

Architectural Service

THE INTERNATIONAL NICKEL COMPANY, INC., offers the co-operation of its engineering and research facilities in determining the suitability of Monel Metal for various uses.

Our engineers are available for consultation in reference to the adaptation of Monel Metal to the architects' requirements and will be glad to assist the fabricator with recommendations for working of Monel Metal.

Elevator Door, Lobby of Union Trust Building, Detroit, Mich.

SMITH, HINCHMAN & GRYLLS, Architects

Favrille glass of various colors are inset in the background of Monel Metal

INTERNATIONAL ART FOUNDRIES

Pearson Gallery of Sculpture
545 Fifth Avenue, NEW YORK, N. Y.

Products

MONUMENTS; BRONZE DOORS; FOUNTAINS; GARDEN SCULPTURES; MEMORIAL TABLETS; SCULPTURED LIGHTING FIXTURES; MODERN DECORATIVE BRONZES; ANTIQUE REPLICAS.

Service

For several decades our Munich foundries have created a distinct superquality in bronze casting—probably never surpassed in art foundry history—a world standard for master efficiency, whether in the exquisite execution of the most delicately modeled statuary or the casting of colossal monuments. Our artisans have the same masterly technical skill whether working in bronze, brass, lead, aluminum, or silver and gold.

The service of our organization is unusual in its scope. We are in direct touch with hundreds of sculptors and famous museums enabling us to procure copies of almost anything in statuary—modern or antique.

"Cupid and Crane" by C. Paul Jennewein

From the "Pearon Collection of Bronze Replicas of Antique Sculptures" (200 Subjects)

"Study for a Garden Pool" by Allan Clark

"Arab" by Allan Clark (Gold Plated)

"Healy Memorial Door" by Rene Chambellan

"Doors of the U. S. Capitol" by Rogers (Cast 1861)

From the "Maus Collection" of Over 7,000 Replicas of Antique Lighting Fixtures

© "Diana" by Saint Gaudens in the Metropolitan Museum

"Bronze Sarcophagus" by Prof. Georgii

Hoisting the Head of "Bavaria" (1844) from a Painting by Kaulbach (The Largest Bronze Ever Cast)

"Goethe Monument," Chicago, Ill. by Prof. Hahn (Cast 1913)

TREVOR F. JONES & CO.

Manufacturers and Designers of Bronze Tablets, Letters and Inlaid Vitreous Enamel Products

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408 West Broadway
NEW YORK, N. Y.

ESTABLISHED
1883

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Products

CAST TABLETS of brass, bronze, aluminum, benedict nickel, stainless steel and monel metal.

INCISED or CAST BRONZE TABLETS with Inlaid Vitreous Enamel Letters, Borders, etc.

INDIVIDUAL LETTERS inlaid with vitreous opaque or translucent enamel; also Individual Letters of brass, bronze, aluminum, benedict nickel, stainless steel or monel metal, for building-fronts and similar uses.

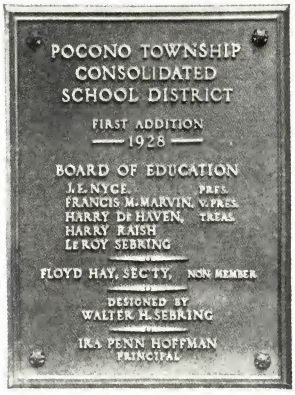
EXTERIOR and INTERIOR DIRECTORIES for commercial, office or professional buildings, with cast or incised inlaid vitreous enamel name plates.

HAND ENGRAVED PLATES.

ELECTRIC DIRECTIONAL and ELEVATOR SIGNS in bronze or aluminum.

BANK TELLER and WICKET PLATES.

BRONZE and COPPER RAISED LETTER ASSEMBLED SIGNS, consisting of individual bronze letters mounted on oxidized copper background.



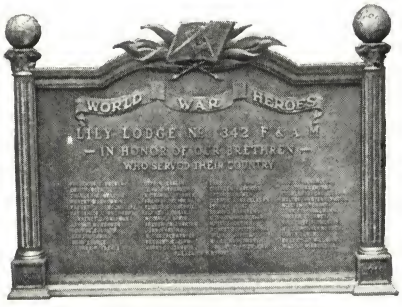
Bronze Tablet with Raised Letters and Stippled Background

Inlaid Vitreous Enamel Bronze Sign

Letters are ivory inlaid vitreous enamel, the border is green and ivory, and the figure is reproduced in natural colors. Signs of this type combine the beauty and attractiveness of color with the dignity and durability of bronze

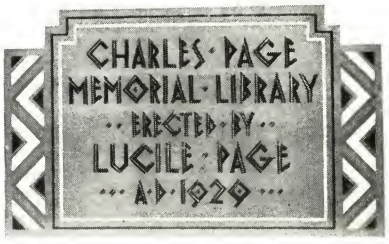
Left:
Copper and Inlaid Vitreous Enamel Directory

Back panel is of sheet copper with bent bevel. Name plates are of oxidized dark statuary bronze with file bevel and the hand-engraved letters are inlaid with vitreous enamel



Cast Bronze Memorial Tablet

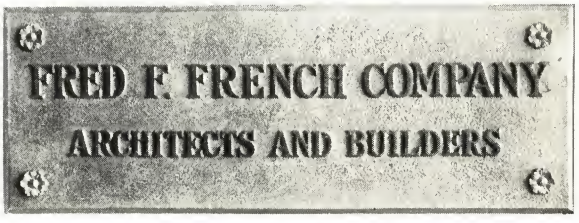
Body design all special, finished in light statuary; letter faces, ornamental and high lights, fine emery surfaced. This beautiful tablet typifies the skill of Jones craftsmen to whom the production of distinctive and enduring tablets may safely be entrusted



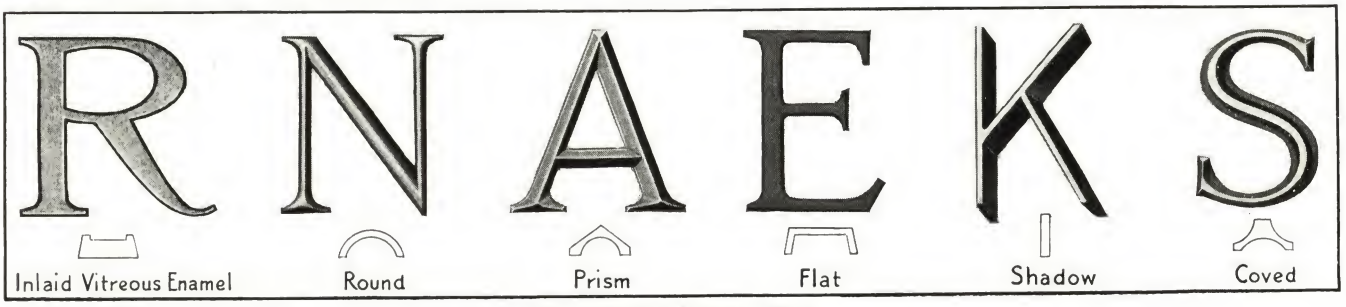
Hand-engraved Bronze Plate with Inlaid Vitreous Enamel

Electric Elevator and Directional Signs

We are equipped to produce electric elevator and directional signs to harmonize with any architectural motif. The lobbies of many of America's finest buildings are beautified with signs produced in our shops



Raised Letter Bronze Sign



Cast Individual Bronze Letters

Made in any size

ESTABLISHED 1827

WM. H. JACKSON COMPANY

Artisans in All Metals,
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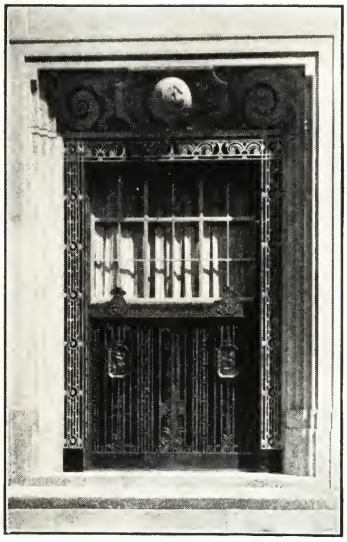
ORNAMENTAL METAL WORK, including Entrance Doors, Grilles, Window Guards, Store Fronts, Spandrels, Bank Screens, Railings, Elevator Fronts, Mausoleum Work, Memorial Tablets, Signs, Letters, Bulletin Boards, Lamps, Check Desks,

Products

Clocks, Marquises, Driveway Gates, Fence, Fireplace Fixtures and Mantels.

For Jackson Windows, Stone Mantels, Fireplace Fixtures, Tile and Swimming Pools, see Manufacturers' index.

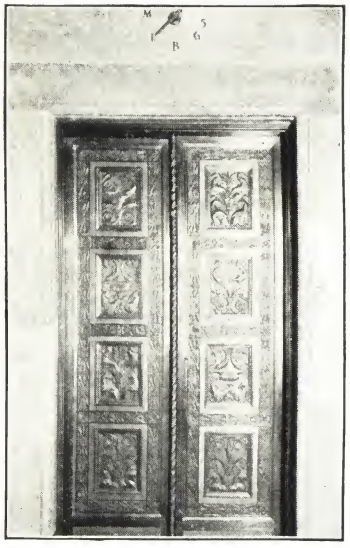


Aluminum, Bronze and Monel Metal Entrance

York Tel. & Tel. Building
York, Pa.
F. G. DEMPWOLF, Architect

Bronze Entrance

Stone & Webster Building
New York, N. Y.
CROSS & CROSS, Architects



Bronze Elevator Doors

First Mechanics Nat'l Bank
Trenton, N. J.
YORK & SAWYER, Architects

Standards of Craftsmanship

A national reputation and over one hundred years of continuous operation is the reward of unaltered and persistent standards of fine craftsmanship.

Although the WM. H. JACKSON COMPANY is one of the oldest manufacturers in the industry and has an extensive and fully equipped factory, they do not maintain that age and size are synonymous with quality. An ideal to do things better has persisted through a century and is a tribute to a fixed policy and attitude of all our executives and every artisan.

The standard of fine craftsmanship which exists in this organization makes it possible to produce work of the very highest quality. This standard of quality in workmanship and the ideal of constant improvement and development is upheld by continual research and study in the use and application of the newer alloys and processes suitable to ornamental metal work.

Facilities and Service

WM. H. JACKSON COMPANY offers unlimited manufacturing facilities for cast and wrought metal work in all alloys suitable for ornamental use. The factory is equipped to handle every operation. The long list of important commissions executed in recent years and during 1931 indicates the broad experience offered.

Without obligation WM. H. JACKSON COMPANY furnishes a consulting service on all points of construction, uses of various metals and preliminary estimates of cost and suggestions in preparing details and specifications. Samples of color and finish for single metals and combinations will be furnished while preliminary studies are being prepared.

A designing department is maintained to consult and collaborate in the solution of difficult or unusual problems. Many important and interesting projects have been carried out through the co-operation of these various services.

RECENT INSTALLATIONS

Bronze Tablet
Robert College
CHARLES KECK, Sculptor

Bronze and Nickel Bronze Interior Metal Work
Peacock Alley, Waldorf-Astoria Hotel
SCHULTZE & WEAVER, Architects

Bronze Tablet
Church of the Nativity
B. G. GOODHUE ASSOCIATES
Architects

Waldorf-Astoria Hotel, New York, N. Y.
Schultze & Weaver, Architects

Penn Mutual Life Insurance Co., Philadelphia, Pa.
Ernest J. Matthewson, Architect

Dime Savings Bank, Brooklyn, N. Y.
Halsey, McCormack & Helmer, Architects

Ohio State Office Bldg., Columbus, Ohio
Harry Hake, Architect

Stone & Webster Bldg., New York, N. Y.
Cross & Cross, Architects

Northwest Dist. Office Bldg., Philadelphia, Pa.
John T. Windrim, Architect

R.C.A. Building, New York, N. Y.
Cross & Cross, Architects

New York Times Bldg., Brooklyn, N. Y.
Albert Kahn, Inc., Architects

Strawbridge & Clothier, Philadelphia, Pa.
Simon & Simon, Architects

Aluminum Vestibule Screen
R.C.A. Building, New York, N. Y.
CROSS & CROSS, Architects

Brooklyn Central Court Bldg., Brooklyn, N. Y.
Collins & Collins, Architects

U. S. Botanic Gardens, Washington, D. C.
David Lynn, Architect

Empire State Building, New York, N. Y.
Shreve, Lamb & Harmon, Architects

New York Hospital, New York, N. Y.
Coolidge, Shepley, Bulfinch & Abbott, Architects

Juilliard School of Music, New York, N. Y.
Shreve, Lamb & Harmon, Architects

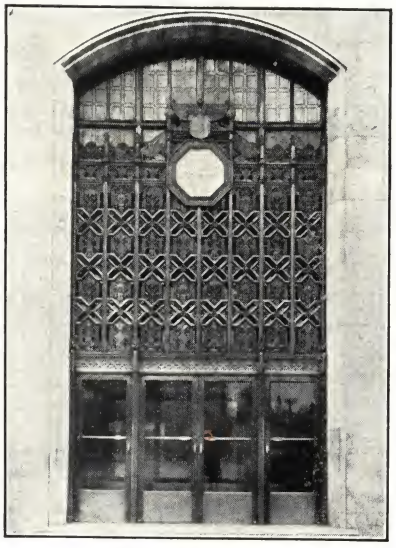
Duke University, Durham, N. C.
Horace Trumbauer, Architect

Folger Shakespeare Memorial Library, Washington, D. C.
Paul Philippe Cret, Architect

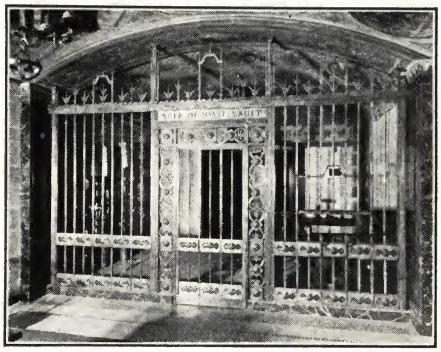
Architects Building, Philadelphia, Pa.
Architects Group, Architects

C. Brewer & Co. Building, Honolulu, T. H.
Mayers, Murray & Phillip, Architects

Nickel Bronze Entrance
Broadway-39th Street Building
New York, N. Y.
ELY JACQUES KAHN, Architect



Bronze Entrance
Bloomfield Bank & Trust Co.
Bloomfield, N. J.
UFFINGER, FOSTER & BOOKWALTER, Architects



Wrought Iron and Bronze Safe Deposit Screen
Kings County Savings Bank
Brooklyn, N. Y.
HALSEY, MCCORMACK & HELMER, Architects

LOGAN CO.

Ornamental Iron and Wire Work

209 North Buchanan Street, LOUISVILLE, KY.

MEMPHIS OFFICE, 63 South Third Street

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WIRE WORK, including Guards, Gates, Partitions and Railings.

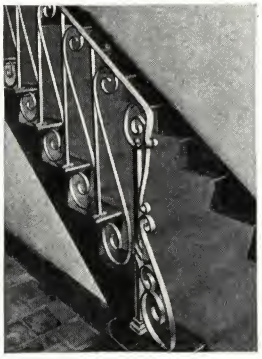
TRADE-MARK

Service

A long-established firm with a modern plant equipped to execute contracts in a prompt, efficient, and accurate manner. Skilled erection crews.

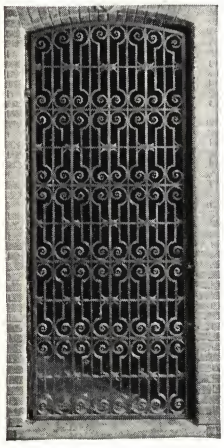
Separate catalogues on different items furnished on request. Advise as to requirements.

Cast Iron Marquise

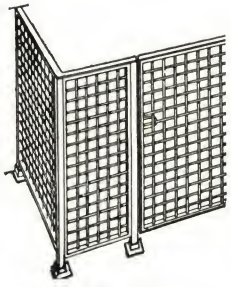


Iron Stair Railing

Steel Stairs

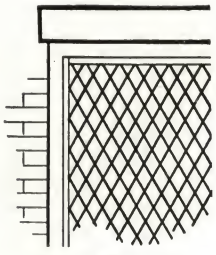


Gate in Archway of School Building

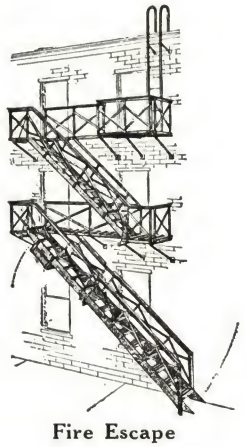


Wire Partition

Iron Fencing



Wire Guard

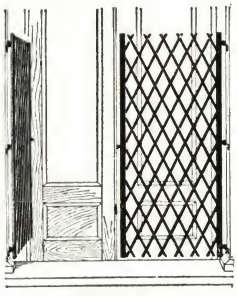


Fire Escape

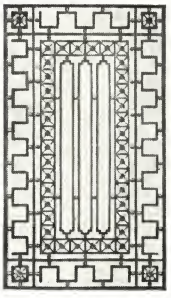
Cast Iron Work

Porch Railing

Cast Iron Front

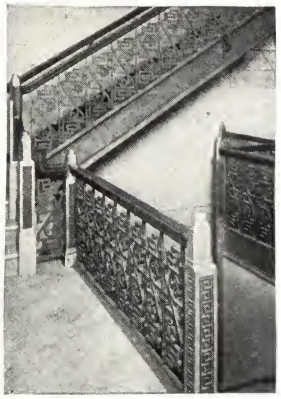


Folding Gate



Ornamental Grille

Spiral Stair



Metal Railing

Pipe Railings

Made up either level or for stairs—of steel pipe or brass tubing.

Logan Spiral Slide Fire Escapes

Full detail drawings and specification shown in another section. See Manufacturers' Index.

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Architectural Gray Iron Castings; Front Work, Entrance and Window Frames; Spandrels; Fascias; Cornices; Marquises, Frames and Pendants; Stairwork; Newels, ornamental and plain; Columns; Pilasters; Panels; Saddles, door and elevator; Cast Iron Grille Work.

Also Ornamental Wrought Iron, including hammered and high lighted finish, required in architectural treatment of building as well as in connection with cast iron work.

Facilities

Fully equipped plant including drafting, engineering and designing department. Pattern department and foundry familiar with all kinds of carved pattern work, intricate cored work for all architectural purposes. Complete fabricating plant for fitting cast iron work with all necessary steel and iron work for shipping work ready for erection if required. Large stock of ornamental patterns.

Reputation

Over seventy years of experience, and pattern makers, molders and fitters trained for this special work, have made our products well known for the quality of their ornamentation and finish.

Recent Buildings with McKinney Castings

Building and Location	Architect
City Hall, New Haven, Conn.	Egerton Swartwout
First National Bank, Greenfield, Mass.	Dennison & Hirons
New York State Office Building, Albany	Sullivan Jones
Smith-Young Tower, San Antonio, Tex.	Atlee B. & Robert M. Ayres
Ohrstrom Building, 400 Madison Avenue, New York, N. Y.	H. Craig Severance
Richfield Savings Bank, Richfield, Conn.	R. E. Hawes and E. F. Strassle
National Savings Bank, Albany, N. Y.	Halsey, McCormack & Helmer, Inc.
Lamp Standards, Washington Bridge, Providence, R. I.	Clarence W. Hudson
J. Hazard Campbell Residence, East Aurora, N. Y.	Peabody, Wilson & Brown
Lamp Standards, University of Rochester, Rochester, N. Y.	Gordon & Kaelber
Yale Institute of Human Relations, New Haven, Conn.	Grosvenor Atterbury
U. S. Post Office, Roanoke, Va.	Government Architect
Kresge Buildings, Providence, R. I., and Rochester, N. Y.	Company Architect

Three Examples Where Architectural Cast Iron Combines Beauty, Character and Permanence

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THE MAUL CO. OF ILLINOIS
5821 West 66th Street
CHICAGO, ILL.

MACOTTA, A METALIZED BUILDING UNIT

What Macotta Is

Macotta is a lightweight concrete building unit, the exposed surfaces of which are covered with an impermeable coating of suitable metal. Only metals of approved durability are used, such as bronze, copper, brass, tin, aluminum, lead and chrome-nickel stainless steel. Artistic colorings are produced during manufacture, the beauty of which is enhanced upon long exposure. This feature of Macotta is well illustrated by the beautiful patina found upon aged statuary of brass, bronze or copper.

Why Architects Select Macotta

Architects select Macotta because:

(1) Its attractiveness, permanence and relatively low cost.
(2) A wide choice of metals permits original color expression.
(3) Ornamentation is effectively reproduced from the architect's drawings.
(4) The lightweight concrete has adequate strength and exceptional heat insulation value through the use of cellular aggregate.
(5) Materials of the highest quality are selected for manufacture.
(6) The adhesion of the metal to the concrete is unaffected by the most severe exposure.
(7) Macotta is moistureproof on all sides.
(8) Macotta units are placed in masonry as easily and quickly as similar pieces of stone, cast stone, etc. No special dowels, anchors or other unusual methods of attachment are necessary. Where Macotta is used as a veneer, several simple methods of construction are available.
(9) Macotta is an ideal material for spandrels, decorative panels or entire masonry surfaces.

American architects may be justly proud of their progress in combining beauty of proportion and of detail with the necessary utilitarian needs of modern buildings. Today, more than ever before in the history of architecture, there is available a variety of ornamentation adaptable to the expression of creative individuality. Among the acceptable mediums through which such individuality may be expressed is the modern building material Macotta.

The Macotta Process

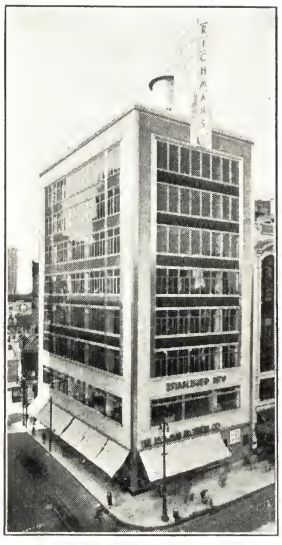
As is frequently the case when important progress is made, the principles involved in the manufacture of Macotta are simple, although some of the technical details must be closely controlled. There are two essentials: (a) the proper type of concrete and (b) an even and impervious coating of metal.

The Concrete—The concrete must meet all building code requirements for strength and absorption and, in addition, must provide a surface upon which the metal will be *permanently* bonded. To assure this latter provision, lightweight cellular aggregate is used for the concrete. The aggregate is uniform, sound and clean. Even the finest particles contain minute pores.

The latest technical developments are used in designing the mix and in placing and curing the concrete. The castings are kept moist until the concrete is thoroughly hardened, after which the free moisture is removed by drying. The surfaces to be metalized are then treated to remove the surface cement film and to expose the cells of the aggregate particles.

The Metal—The metal is reduced to a molten condition and projected against and *into* the cellular concrete surface under an air pressure of from 50 to 100 lbs. The result is to force the molten metal into the cells of the aggregate, positively anchoring the metal into the casting. The metal is built up to the required thickness; the whole being perfectly fused and forming an integral mass.

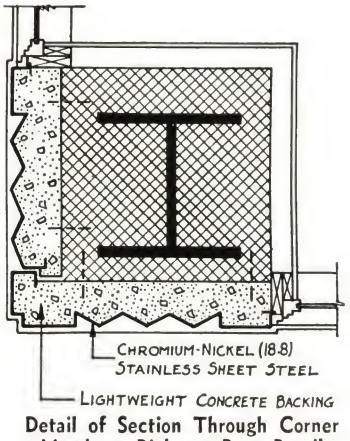
Drying the concrete before the application of the metal causes the concrete to be inert and not subject to shrinkage. Further protection against volume change is assured by coating all surfaces, not metalized, with an asphaltic waterproofing compound.



Richman Bros. Retail Store, Detroit, Mich.
ALBERT KAHN, INC., Architect
Chromium-nickel stainless steel Macotta used for vertical corner members, jambs, sills, lintels and coping

MACOTTA
A METALIZED BUILDING UNIT
PATENT PENDING

New Center Building, Detroit, Mich.
ALBERT KAHN, INC., Architect
Macotta spandrels between eighth and ninth floors



Detail of Section Through Corner Members, Richman Bros. Retail Store, Detroit, Mich.

Tests Prove Macotta's Permanence

Standard Macotta samples have been tested by Robert W. Hunt Company, Engineers, who subjected the material to the following tests:

(1) *Freezing and Thawing:* Specimens were "subjected in the freezing chamber at 10° below zero (F.) and left to remain there for 24 hours, at the end of which time they were removed and immersed in water at a temperature of 120° F., remaining there for one-half hour, then again subjected to freezing at 10° below zero for 24 hours. This was continued for 15 cycles."

(2) *Dry Ice Freezing and Thawing:* The specimens were first soaked in water and then put in dry ice for two hours, then immersed in hot water for an hour. This was continued for 10 cycles.

(3) *Sodium Sulphate Test:* Consists of saturating the specimens in a solution of sodium sulphate for 20 hours and then heating them in an oven for 4 hours at 212° F. Twenty-one cycles of this test were conducted.

All of the above tests are standard for determining the weathering qualities of building materials. Macotta successfully withstood all of them as noted by the Robert W. Hunt Company report, "No indications that the metal coating was loosening away from the Haydite concrete were noted."

An additional series of freezing and thawing tests is now under way in which over 100 alternations of freezing and thawing have already been made without affecting the bond between the metal and the concrete.

In addition to laboratory tests, research has been and continues to be made in a practical way at our factories. Specimens representing every type and character of Macotta are subjected to actual weather conditions on the roofs of our plants. These tests have been under way for three years.

Macotta Metals

Copper, Bronze, Brass and Nickel-silver (Green and Brown Finishes)—Copper, bronze, brass and nickel-silver are all members of the copper metal family; that is to say, copper is the predominating metal. These metals yield similar color effects upon treatment, although inherently copper is the darkest in shade, and bronze and brass are intermediate and nickel-silver is the lightest. Exposed to weather this class of metals assumes a rich greenish or brownish color, depending upon the predominating atmospheric condition. The characteristic oxidation of these metals is responsible for their enduring nature through the formation of non-soluble, unchangeable oxides on the surface and in the pores of the metals, acting as a permanent protection. This is the "patina" which beautifies bronze and copper statuary, some of which has been exposed for centuries.

Lead (Natural and Gray Black Finishes)—Exposure to the elements enhances its natural rich color with soft dark gray or dark blue tones.

Tin (Bright Gray in Color)—Tin, in its pure base form, is a metal of established usage where high resistance to corrosion is to be encountered. Its original bright, satiny gloss weathers slowly to a medium gray.

Tin-Lead (Light Gray)—Tin-lead is an alloy consisting of varying proportions of tin and lead. Pewter is one of the best known of these alloys and is composed of approximately 50% of tin and 50% of lead. When new, it has a bright sheen and after exposure to weather it attains a dull gray color, darker than aluminum or tin and somewhat lighter in shade than lead.

Aluminum (Natural Finish in Silver-Gray)—Aluminum is a modern development in metallurgy, possessing qualities that recommend it for a wide variety of structural uses. In Macotta, aluminum is offered wherever a light colored metal is desired. When new, aluminum is a bright silver which assumes a dull, light gray after considerable exposure to the elements.

Chrome Nickel (18-8) Stainless Steel (Natural White-Gray Polished Finish)—Stainless steel is used in what is termed Sheet Macotta. Instead of fusing as is done in the case of all the metals thus far described, stainless steel sheets are formed to the proper design and the edges are firmly anchored into the lightweight concrete backing. Chromium-nickel stainless steel, itself, is manufactured under trade names such as Allegheny Metal, Enduro, U. S. S. Chromium, etc., and is much in demand where a bright, polished surface is wanted. The metal retains its original luster and is easily cleaned with soap and water. The principal advantages of Sheet Macotta are: ease of installation (the unit is set into the wall in the same manner as stone, cast stone, etc.); the metal is firmly held in true, plane surfaces; no steel angles or other supporting members are required; the back of the metal sheet is protected against moisture so that the unpolished back surface of the sheet cannot corrode; large wall areas may be covered without the lapping of adjoining sheets.

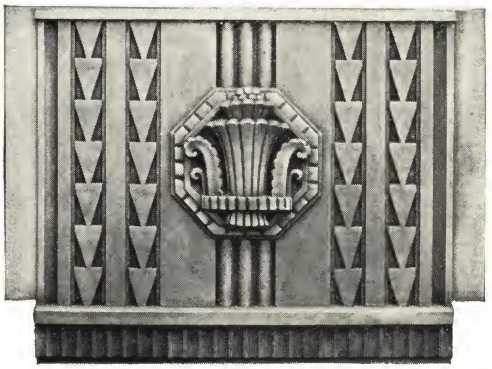
General—The above metals have been selected as standards for Macotta because long usage has demonstrated their permanent nature, and because they provide a wide range of attractive colors. However, additional metals are available for interior use and special requirements.

Syracuse Lighting Company Building, Syracuse, N. Y.
Bley & Lyman, Architects
Macotta spandrels in lead metal

Macotta Spandrel Used on Bloomfield Township School, Chicago Heights, Ill., and Y. M. C. A. Building, Waterloo, Iowa

These Macotta panels are cast into steel sash frame for continuous steel sash construction. Area approximately 4x5 ft., thickness 1⅝ in.

Nicholas Building, Chicago, Ill.
Meyer & Cook, Architects
Macotta ornament including bronze pilasters and caps, copper spandrels and belt course



Macotta Spandrel in Copper Metal, New Center Building, Detroit, Mich.
Albert Kahn, Inc., Architects

Metal Combinations

The architect may find that his ideas on color treatment are best expressed through the use of different metals on individual Macotta units or on portions of the same unit. For example, where pilasters and spandrels are of Macotta, the pilasters may utilize one metal and the spandrels another; or in a single spandrel, the field may be of one metal and the ornament of another. When combining metals in the same unit, it is necessary to observe certain precautions so that the metals harmonize electrolytically. For example, various metals of the copper family, copper, bronze and brass, should be kept in relation, while aluminum or tin and lead fall into a separate classification.

Macotta Specifications

General—The Macotta manufacturer and the erection contractor shall be governed by the "General Conditions of the Contract" of the American Institute of Architects. (Fourth Edition, Copyrighted 1925.)

Work Included—This specification covers all labor, materials and services incidental to and including the furnishing and erecting of all Macotta as indicated on the drawings and specified herein.

Division of Work—The Macotta manufacturer shall furnish all Macotta required by this specification.

The erection contractor shall unload, receipt for, store, protect and erect all Macotta covered by this specification and shall provide and install all necessary anchors.

Drawings and Details—Scale and detail drawings shall be furnished where necessary by the architect and shall be accurately conformed to in the execution of the work.

The manufacturer shall prepare complete shop drawings for all Macotta, showing sizes, sections and dimensions of pieces, jointing, bonding, anchoring and all other necessary details. Each piece of Macotta shall have a setting number.

Copies of all shop drawings shall be submitted to the architect, one set to be approved by the architect in writing thereon and returned to the manufacturer before the manufacture of the Macotta is started.

Models—Models for ornamental work shall be furnished by the Macotta manufacturer and photographs submitted to architect for approval before manufacture or full size models will be furnished by general contractor f.o.b. location of Macotta manufacturing plant as outlined under specifications heading "General—Models."

The general contractor shall furnish to the Macotta manufacturer all drawings, details and information necessary to enable the Macotta manufacturer to properly check the Macotta with connecting structural work to assure that these shall be in perfect agreement.

Reglets, rabbets, slots, etc., as shown by the architect's drawings shall be provided in Macotta to receive all flashing, sheet metal work or other work which comes in conjunction with the Macotta.

The Macotta shall be provided with setting loops or lifting-hooks where necessary for setting purposes.

Quality of Macotta—All Macotta shall be manufactured according to standard Macotta practice and shall be the product of a manufacturer having capacity and facilities for furnishing the quality, sizes and quantities of Macotta required without delaying the progress of the work, such as:

The George Rackle & Sons Co., Box 1778, Station D, Cleveland, Ohio; The Maul Co., 1640 E. Hancock St., Detroit, Mich.; The Maul Co., 5821 W. 66th St., Chicago, Ill.

The Macotta concrete shall be made with lightweight aggregate and shall be sufficiently strong to properly support all structural loads. Reinforcing must be provided where required.

All portions of each unit except those metalized shall be treated with Dehydratine No. 3 or R.I.W.

Color and Finish—The surface shall be of the metal and finish as approved by the architect and represented by the sample on file designated by serial number.

Handling and Storing at Site—The erection contractor shall so handle and store Macotta at the site and during erection as to prevent soiling, discoloring, mutilation or chipping.

Setting Mortar—All Macotta shall be set in a mortar composed of one volume portland cement, one volume of cold lime putty and six volumes of sand.

Setting the Macotta—The erection contractor shall set each Macotta unit so that it rests upon a full bed of mortar and in a manner so that the exposed surfaces are not marred in any respect.

Joints—All horizontal joints shall be raked out ¾ in. deep on the face for pointing. All vertical joints shall be set dry. These joints shall be calked on the outside profile with oakum and shall then be filled with a liquid grout composed of one volume of portland cement and one volume of fine sand premixed at least one hour before using and as of thick consistency as can be poured in the joints. After the mortar or grout has thoroughly set, all joints shall be tightly filled with an approved elastic calking compound by means of an approved gun designed for this purpose.

Protection—All Macotta work after setting shall be properly protected from damage by means of a suitable covering, where necessary, until completion of the work. The erection contractor shall be responsible for all breakage and shall replace all broken pieces at his own expense.

Cleaning—For final acceptance, the erection contractor must thoroughly clean Macotta being very careful not to use any acids or alkalis which will discolor the metal in any manner.

Macotta Bronze Spandrel, Royal Connaught Hotel, Hamilton, Ont.
Hutton & Souter, Architects

A Few Representative Macotta Installations

Note: In use, Macotta has fulfilled all expectations. The first and succeeding Macotta projects are excellent. Several installations have been exposed for two years. The most critical examination of all projects fails to reveal any effects of weathering which would impair the permanence of Macotta. The color tones of the oldest jobs lend distinction to the buildings. Architects are repeat users and owners are satisfied.

The following list of Macotta-trimmed structures comprises a variety of types and includes both large and small projects. Each job is a worthy reference for Macotta and a monument in support of the permanent nature of the material.

Chicago, Ill.—†Milwaukee and Diversey Aves., *Milwaukee and Spaulding Aves., *Lincoln and Ashland Aves., *Lincoln and Belmont Aves., *Roosevelt Road and Kedzie—Leichenko & Esser, Architects (5). **Petrolagar Laboratories, **Jefferson Electric Co.—Olsen & Urbain, Architects (2).

Oak Park, Ill.—*Marion & William Sts., Meyer & Cook, Architects.

Chicago Heights, Ill.—Bloomfield Township School.

Clinton, Ill.—Parish House, Royer, Danely & Smith, Architects (2).

Milwaukee, Wis.—*Vliet and 34th Sts., Bruce Uthus, Architect.

Kenosha, Wis.—Commercial Building, Lindl & Schutte, Architects.

Detroit, Mich.—New Center Building, Richman Brothers Building—Albert Kahn, Architect (2). ††Vernor Highway and Springwells Ave., Smith, Hinchman & Grylls, Architects. *77 East Vernor Highway, Chas. N. Agree, Architect. *6 Mile Road and Kircheval, Weidmaier & Gay, Architects. ***Beasley Street, The Austin Company, Engineers.

Mount Clemens, Mich.—Courthouse and Office Building, George J. Haas, Architect.

Flint, Mich.—*Patterson Block, J. W. Cook, Architect.

Battle Creek, Mich.—††15 North Jefferson St., L. J. Sarvis, Architect.

Cincinnati, Ohio—*Cincinnati-Covington Bridge Co., Ferro Concrete Construction Co., Engineers.

Pittsburgh, Pa.—Richman Brothers Building, Robert M. Trimble, Architect.

Syracuse, N. Y.—†Syracuse Lighting Co., Bley & Lyman, Architects.

Jersey City, N. J.—Commercial Garage Building, Shilowitz, Architect.

Hamilton, Ont., Can.—Royal Connaught Hotel, Hutton & Souter, Architects.

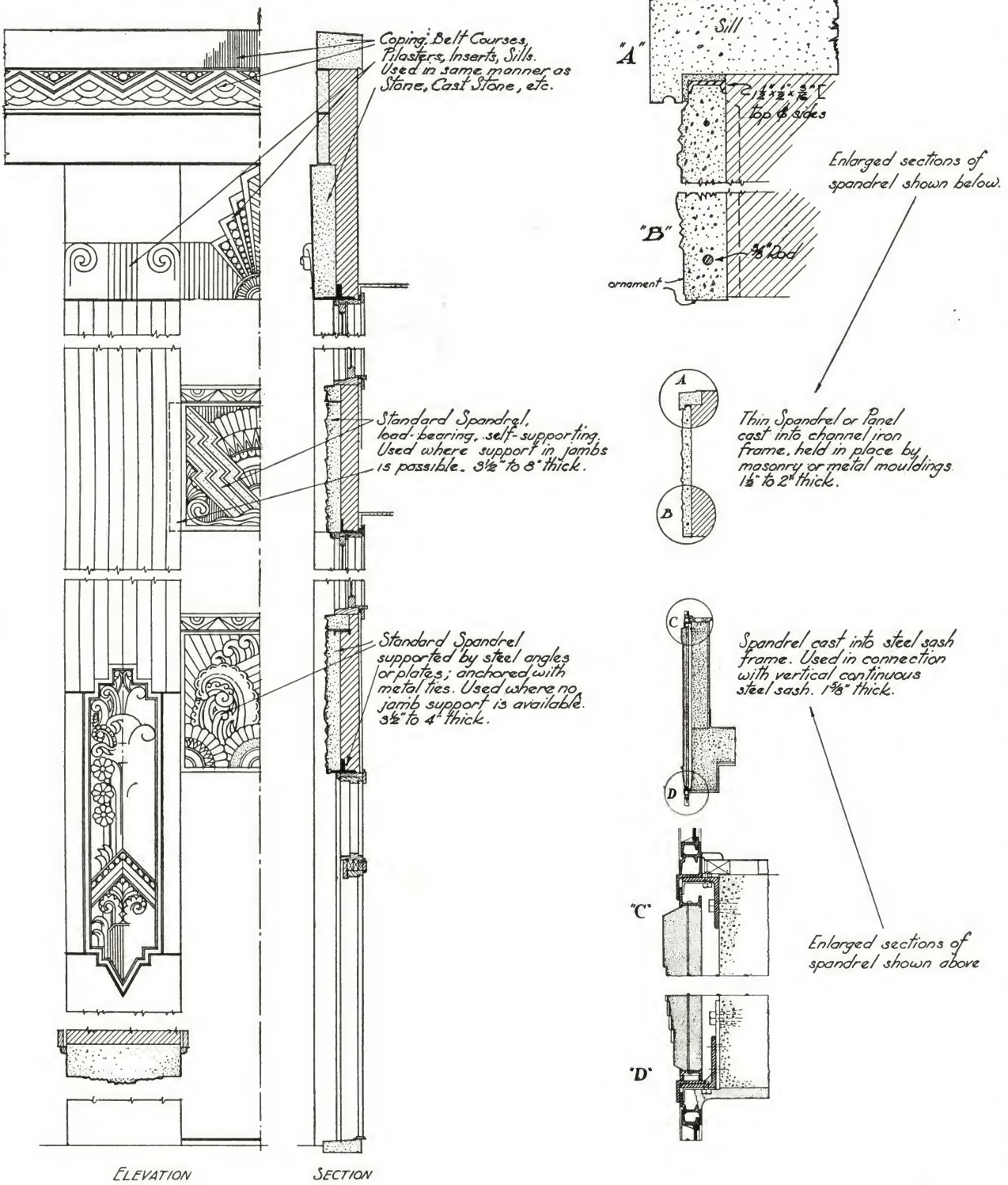
Montreal, Can.—*S. S. Kresge Co.

*Commercial building. **Administration building. ***Factory office building. †Office building. ††Bank building.

INSTALLATION

MACOTTA
A METALIZED BUILDING UNIT
PATENT PENDING

DETAILS



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For our page on Building Directories, see Manufacturers' Index.

Sketches

Where wording and size is furnished we gladly supply full size sketch (except on overhead letters) for approval.

Master Border Designs

The border designs below have been selected for their beauty, correctness, and utility. Our master metal patterns make their use very economical.

Architects' Private Designs

We can follow architects' drawings exactly—or develop special designs from architects' "roughs."

STATUARY BRONZE OVERHEAD LETTERS

Classical Roman Style
Bevel face. Distinguished correctness of form. Great natural beauty

Modern Bodoni Style
Modern expression combined with sound letter form. Excellent display

Modern Broadway Style
Undeniably modern and beautiful. Unsurpassed for the modern facade

Overhead Letter Finishes

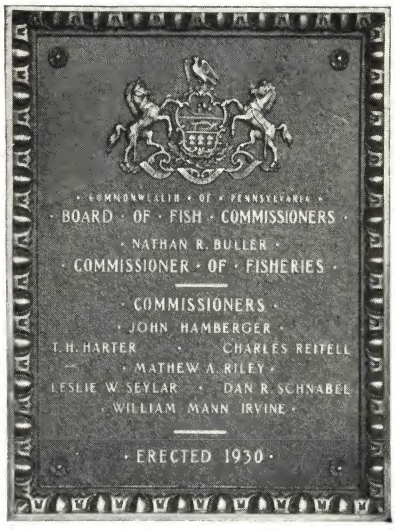
Dark oxidized statuary bronze (for light stone backgrounds), natural golden bronze (or stainless steel or nickel bronze) for dark backgrounds. Bronze finishes are sanded—not burnished—unless specified.

Overhead Letter Sizes

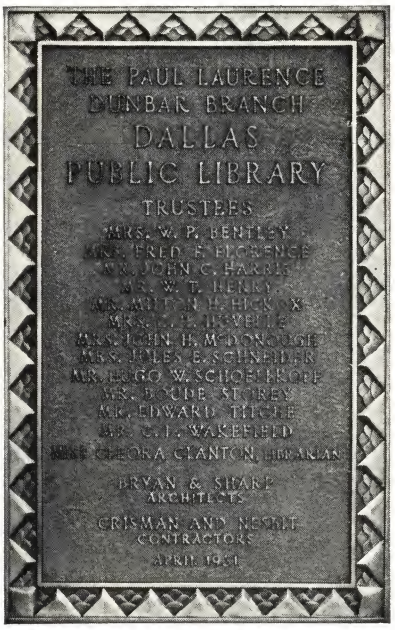
Made any desired size from 2 to 15 ins. or larger.
If you will tell us space available, wording, and letter style preferred, we will gladly suggest suitable size.

MATTHEWS MASTER BORDER DESIGNS

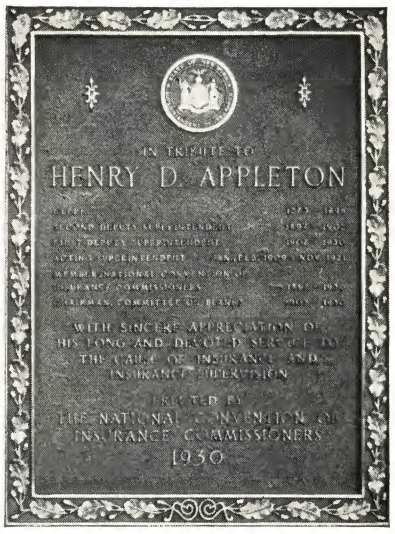
BRONZE TABLETS



Modern Egg and Dart
Illustration 18x24 ins. Made any size. Flat or oval face letters



Dallas Design
Illustration 18x28 ins. Oval or flat face letters. Any size



Oak Leaf No. 150
Illustration 18x24 ins. Made any size. Oval or flat face letters

Designs

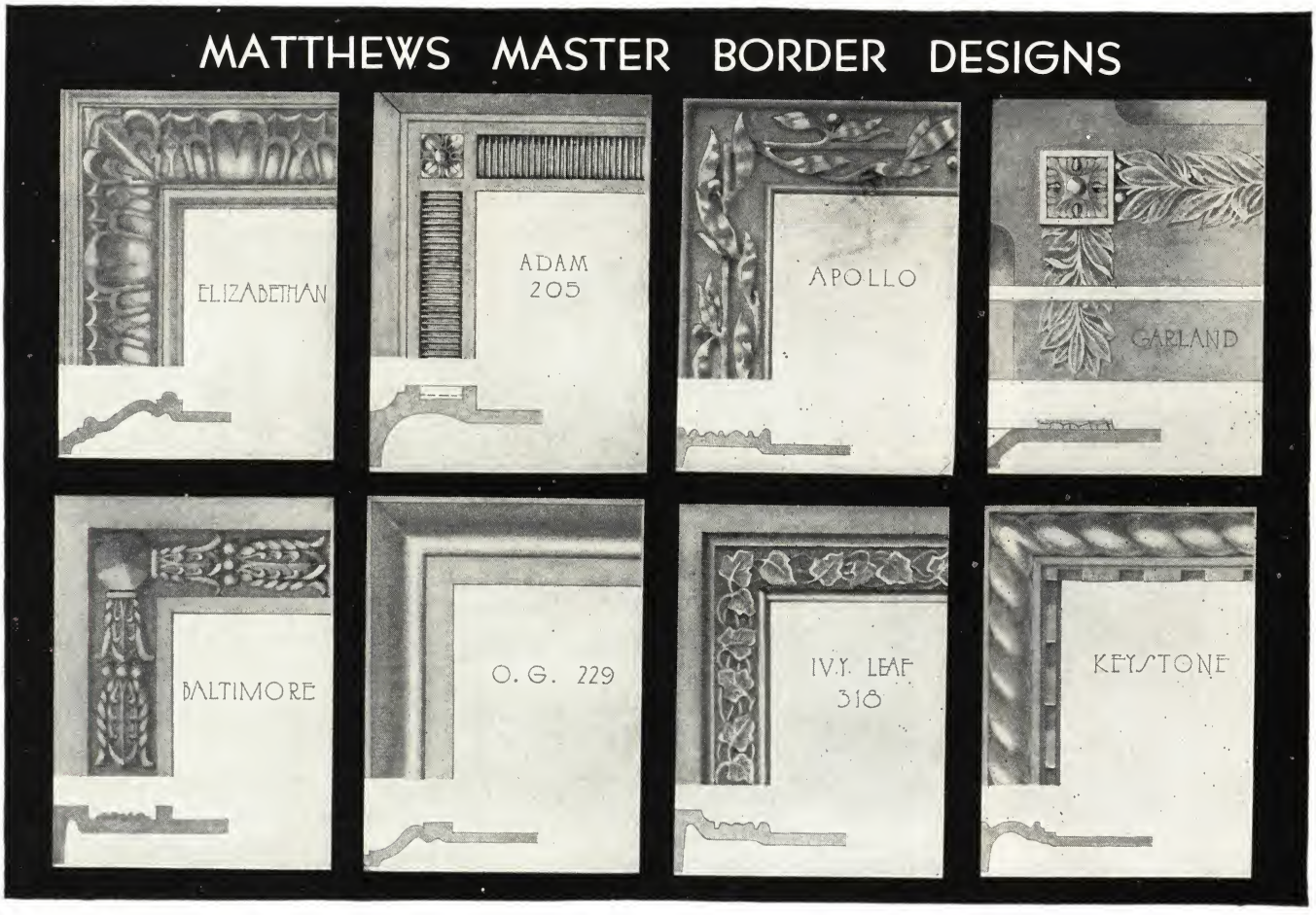
Architect may:
(a) furnish complete design.
(b) furnish rough layout showing size, lettering, and border preferred—see border designs below.
(c) leave design entirely to us, indicating only size and lettering wanted.

Quotations

We need to know the size tablet, wording, and preference (if any) as to design. Say whether oval face or flat face letters are wanted—see tablets above for comparison.

Sketch Service

We particularly invite architects to use our sketch and lay-out service. It is only necessary to tell us the size tablet wanted, the wording, and your preference as to border design—see standard border designs below. Full size sketch showing exact proposed arrangement will be promptly mailed to you.



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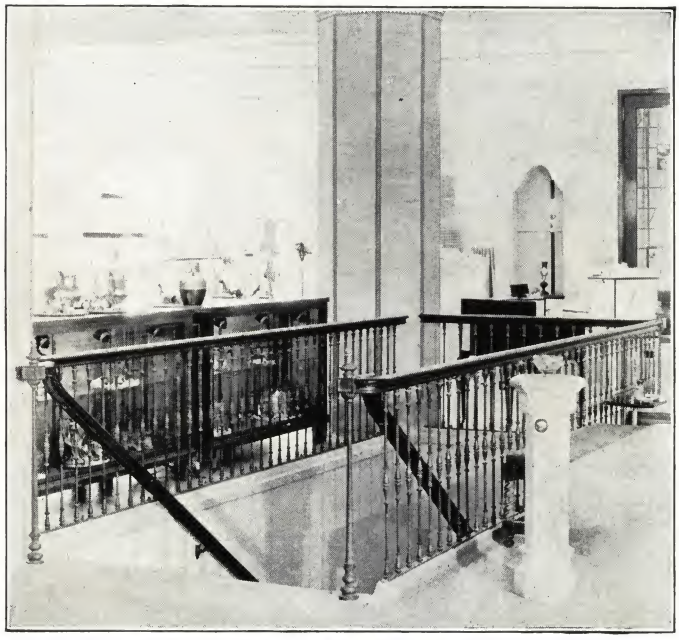
Facilities

Our works embrace modeling rooms and studio, complete foundry for handling plain and difficult "process" casting, finishing and chasing departments, and coloring rooms.



Ornamental Bronze Railing, Fort Worth, Tex.
L. E. LINDSAY, Architect

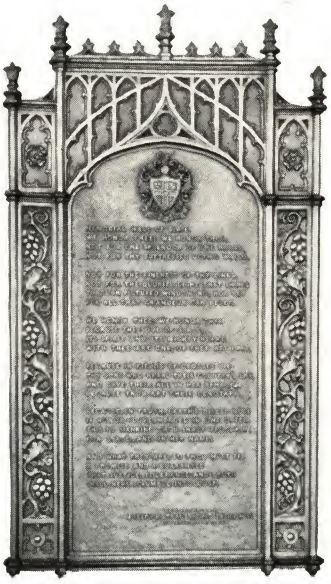
Bronze Marquise and Main Entrance Doors, Boston, Mass.
J. D. LELAND & Co., Architects

Bronze Mausoleum Door, Woods Hole, Mass.
COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, Architects
R. FAGGI, *Sculptor*

Modernistic Bronze and Aluminum Store Fronts, Hennessy Building, Boston, Mass.
HARRY DAVIDSON & SON, Architects

Bronze Tabernacle Door, Church of the Holy Child, Philadelphia, Pa.
A. Lualdi, Sculptor
George I. Lovett, Architect

Bronze Bust Placed at Manchester, N. H
Lucien Gosselin, Sculptor



Bronze Gothic Tablet Northwestern University, Chicago, Ill.
Arthur Howell Knox, Architect

Bronze Drinking Fountain, University of Chicago
Mabel Torrey, Sculptress

Bronze Bas-relief Tablet of General Leonard Wood, Boston, Mass.
Bruce W. Saville, Sculptor

Two of a Group of Five 3-ft. High Bronze Herons, Decatur, Ill.
Christian Peterson, Sculptor

Bronze Altar Gates, St. Paul's Church, Cambridge, Mass.
Raymond A. Porter, Sculptor

Nine-foot High Bronze Statue of U. S. Senator Henry Cabot Lodge, State House, Boston, Mass.
Raymond A. Porter, Sculptor

THE MICHAELS ART BRONZE COMPANY

Orna-Metal Craftsmen Since 1870

235-241 Court Avenue, COVINGTON, KY.
(Three minutes from the heart of Cincinnati, Ohio)

REPRESENTATIVES IN PRINCIPAL CITIES

For our pages on Store Front Construction, Weatherstripping, Access Panels and Frames, see Manufacturers' Index

American Savings Bank, New York City—a Perfect Bronze Example of Michaels Skill of Design

Metal Work

Architectural work produced in bronze, aluminum, nickel, monel, stainless steel and either cast or wrought iron in any design or construction.

Facilities

Centrally located (3 minutes from the heart of Cincinnati) within 12 hours of principal eastern and midwestern cities. Modern, daylight factory equipped with all modern machinery to make working efficient and desirable.

Engineering Department composed of experienced engineers who are at the client's disposal.

Sculptors of commendable reputation are constantly adding to the almost unlimited supply of stock patterns.

The foundry produces castings to meet the requirements of the most exacting demands.

Recommendations

Hundreds of installations stand as monuments to the success of our business—and great numbers of satisfied clients* are loyal to the slogan "Crafted by Michaels."

*Names gladly furnished upon request.

Crafted by MICHAELS

Decorative Aluminum Spandrel and Sill Installed on New First National Bank Building, Oklahoma City

THE NEWMAN MANUFACTURING CO.

FOUNDED IN 1882

Ornamental Bronze, Aluminum, Nickel Silver, Monel and Wrought Iron Work

PLANT
CINCINNATI, OHIO

SALES OFFICES IN ALL PRINCIPAL CITIES OF THE UNITED STATES

Products

CAST, HOLLOW, EXTRUDED, and ESPECIALLY WROUGHT and BUILT-UP ORNAMENTAL METAL WORK, FIXTURES, HARDWARE, etc., of Brass, Copper, Bronze, Aluminum, Nickel Silver, Benedict Nickel, Monel Metal, and Zinc; also Artistic Wrought Iron Work.

For our pages on Lighting Fixtures and Revolving Doors, see Manufacturers' Index.

Facilities

A corps of 650 highly skilled craftsmen, operating foundry and fabricating departments second to none.

Specialties: Entrances and separate doors (cast, hollow, extruded); store fronts of extruded and cast bronze, aluminum and nickel; fixed double hung and casement windows (bronze and aluminum); banking room fixtures; bronze tablets; brass, bronze and wrought iron railings and grilles.

State Capitol, Baton Rouge, La.
WEISS, DREYFOUS & SEIFERTH, Architects

Architectural Service

We maintain a large and efficient engineering and drafting department, and will give splendid service on sketches, details, suggested specifications, and preliminary estimates, positively without obligation. Write for complete portfolio of catalogues.

Board of Education Administration Building, Philadelphia, Pa.
IRWIN T. CATHARINE, Architect

Partial List of Installations

Columbia National Bank, Washington, D. C.
Chicago City Bank & Trust Co., Chicago, Ill.
First Camden Trust Co., Camden, N. J.
Union National Bank, Eau Claire, Wis.
Loew's Theatre, Jersey City, N. J.
E. F. Albee Theatre, Cincinnati, Ohio
Warner Bros. Theatre, Milwaukee, Wis.
Shorham Building, Washington, D. C.
Power & Light Building, Kansas City, Mo.
Tomsig Realty Building, Perth Amboy, N. J.
19 Rector St. Building, New York, N. Y.
Carew Tower, Cincinnati, Ohio
Gas & Electric Building, Cincinnati, Ohio
Ramsey Building, Oklahoma City, Okla.
Dallas Gas Building, Dallas, Tex.
Milwaukee Gas Building, Milwaukee, Wis.
Netherland Plaza Hotel, Cincinnati, Ohio
Yaarab Temple, Atlanta, Ga.
Municipal Building, Denver, Colo.
Agriculture Administration Building, Washington, D. C.
City Hall, Atlanta, Ga.
State Capitol Annex, Lincoln, Neb.
State Capitol, Charleston, W. Va.
Courthouse, Milwaukee, Wis.
U. S. Post Offices: Tucson, Tampa, Long Island City, Lima, Memphis, Wichita, Scranton, Parkersburg, Fall River
Navy Central Y.M.C.A., Philadelphia, Pa.
Fine and Industrial Arts School, Newark, N. J.
Telephone Building, Bridgeport, Conn.
Hebrew Benevolent Congregation Synagogue, Atlanta, Ga.

NORTH AMERICAN IRON WORKS, INC.

116-136 57th Street
BROOKLYN, N. Y.

Products

ORNAMENTAL and MISCELLANEOUS METAL WORK:

Access Doors	Pipe Bends, special
Art Smithing	Pipe Railings
Barn Equipment	Racks
Coal Doors and Chutes	Radiator and Vent Grilles
Entrance Doors	Railings
Fountains	Sidewalk Doors, waterproof
Garden Furniture	Stairs
Lamp Posts	Stable Equipment
Marquises	Steel Partitions
Park Furniture	Tree Guards

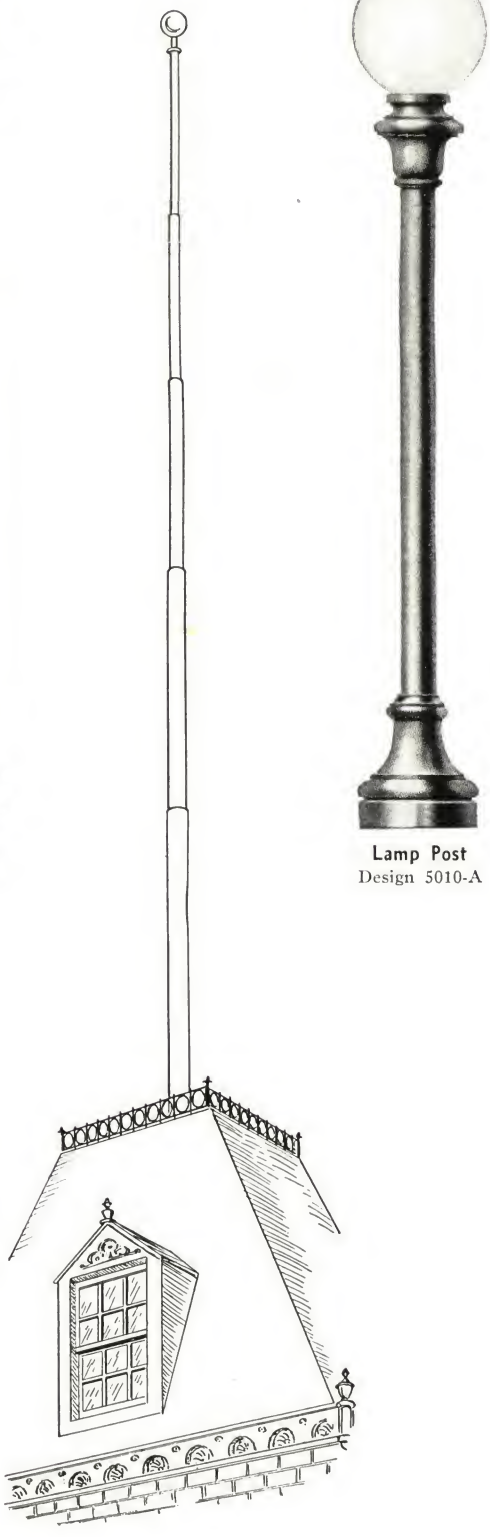
N.A.I.W. Elevator Doors and Fronts.
Swedged Steel and Continuous Tapered Flag Poles.

Ornamental Metal Work

The NORTH AMERICAN IRON WORKS, INC., is equipped and prepared to produce ornamental metal work in iron, steel, brass, bronze, aluminum, etc., from the plainest to the most ornate designs. The architect is offered a general metal shop service that is unusual in its broad scope, and connections that afford a foundry service commensurate with our shop service. Distinctive, exacting and quality work is produced as well as the usual routine items of such shops. Architects often desire an unusual piece of work made in a creditable manner, and this company has equipment which enables it to produce work that essentially embodies craftsmanship.

Low operating costs and the convenient location of the plant make for attractively moderate estimates. The combination of highest factory craftsmanship and reasonable cost has been highly favorable to the architect.

Lamp Post
Design 5015-A



Lamp Post
Design 5010-A

Beauty of Garden Enhanced by Fountain

W. F. OVERLY & SONS

Marquees

GREENSBURG, PA.

For Our Other Products, see Manufacturers' Index

Specifications

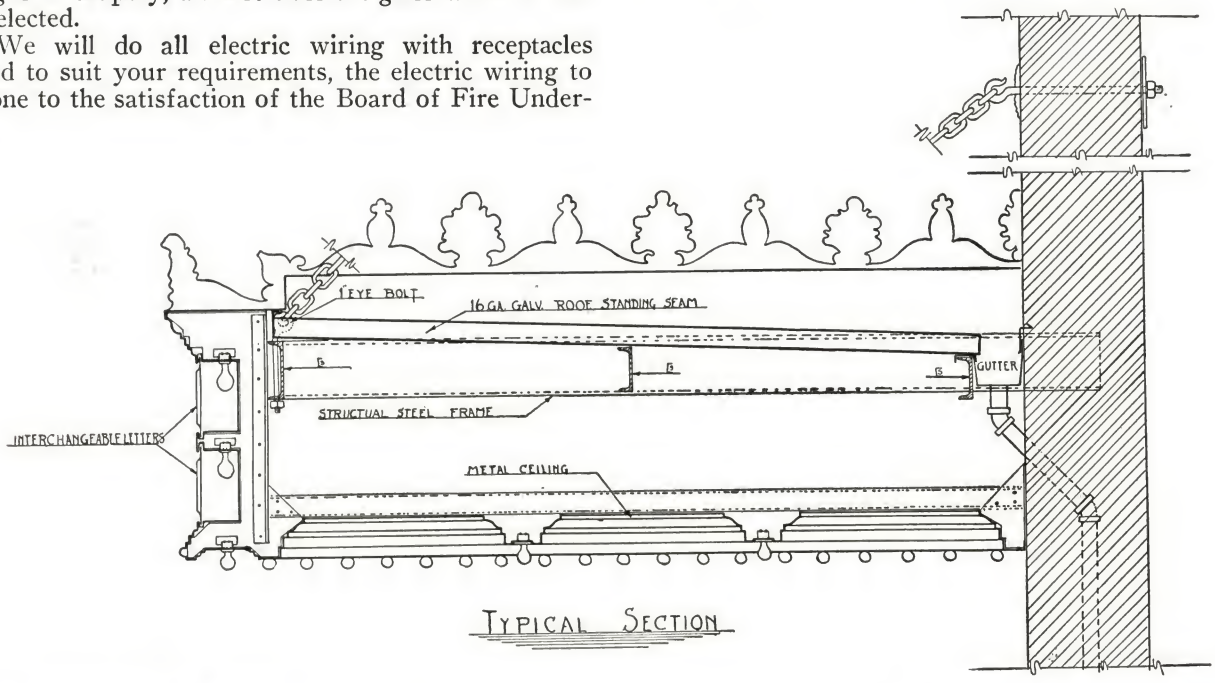
Our propositions will contemplate the furnishing and erecting of your marquee as per the following specifications:

We will furnish and erect all structural steel work necessary to properly support the marquee, heavy chain supports, using ¾-in. open link proof coil chain with bolts and turnbuckles, all sheet metal mouldings, gutters, conductors, skylight frame and enrichments to be of 16 oz. cold rolled copper (or No. 24 galvanized ingot iron with zinc enrichments), glaze the roof with ¼-in. ribbed wire skylight glass, with opalescent glass panels or signs in drapery, all first class art glass work of colors selected.

We will do all electric wiring with receptacles spaced to suit your requirements, the electric wiring to be done to the satisfaction of the Board of Fire Underwriters (ready for the reception of the electric lamps and the connecting of the wires to building).

No woodwork will be used in our construction, but all metal work will be secured to the structural iron frame with metal brackets and brass bolts. All work guaranteed to pass the most rigid inspection of city ordinances and engineers.

Alternate—A No. 16 galvanized iron roof may be substituted for glass roof if desired. This method will permit of a beam and paneled ceiling of galvanized iron and painted in colors as selected.



TYPICAL SECTION

Left:
Bellevue Savings and Trust Co., Bellevue, Pa.

Right:
Logan Valley Trust Co., New Kensington, Pa.

Manos Theatre, Greensburg, Pa.

Left:
Penn Albert Hotel, Greensburg, Pa.

Right:
Trexler Department Store, Dayton, Ohio

PENN BRASS & BRONZE WORKS

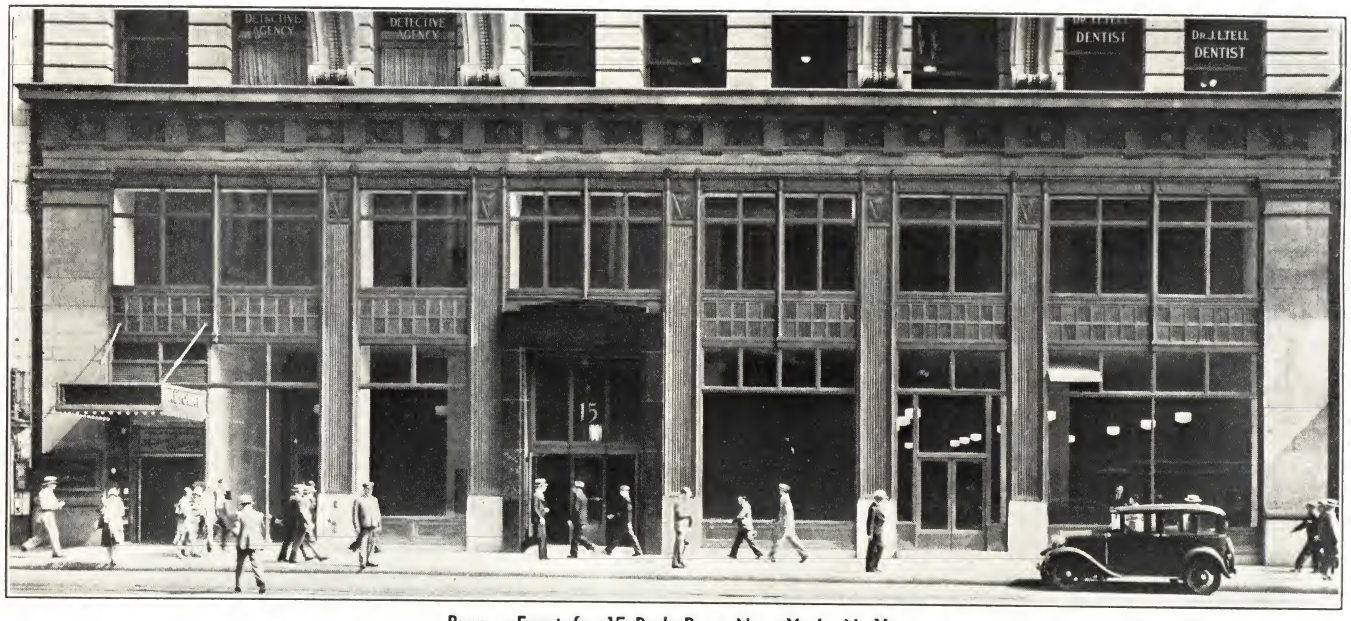
HENRY J. LANDOLT'S SONS

105-117 Dobbin Street, BROOKLYN, N. Y.

ARCHITECTURAL BRASS AND BRONZE WORK

Ornamental Bronze and Brass Work of every description, for private and public buildings:

Doors, Entrances, Balustrades, Newels, Stair Rails, Interlocking Windows, Grilles, Theater Railings, etc.; Cast Bronze Letters, Numerals and Signs for buildings; Gates, Folding Gates, Marquises, Mausoleum Doors and Supplies, Bank Enclosures, Counter Screens, Check Desks, Elevator Enclosures, Fences, Balconies, Lamp Standards, Brackets, Tablets, Push Plates, Kick Plates, Brass and Bronze Saddles, Door and Window Guards, Special Hardware, Special Castings (all Alloys), etc.



Bronze Front for 15 Park Row, New York, N. Y.
CLINTON & RUSSELL, Architects

Cast Bronze Tablet, Fordham University, New York

Vault Grille, Public National Bank, New York
EUGENE SCHOEN, Architect

Bronze Balustrade, 15 Park Row Building, New York

Cast Bronze and Porcelain Enamel Inlay Letters and Tablets

All sizes; made from architects' details and also from stock patterns. Cast bronze name plates, signs and tablets

RELIANCE BRONZE & STEEL CORPORATION

Manufacturers of Hollow Metal and Metal Covered Doors, Frames and Mouldings and Artisans in the Production of Ornamental Metals

GENERAL OFFICES

95 Dobbin Street, BROOKLYN, N. Y.

FACTORIES

No. 1—BROOKLYN, N. Y., Dobbin and Baxter Streets and Norman Avenue

No. 2—LONG ISLAND CITY, N. Y., Review Avenue, Young and Gilbert Streets

No. 3—COLLEGE POINT, L. I., N. Y., Second Avenue and 14th Road

No. 4—HOBOKEN, N. J., 539 14th Street

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

The Reliance Bronze & Steel Corporation has complete facilities for the production in quantity of Hollow Metal Doors, Metal Covered Doors, Door Bucks, Combination Door Frames, Hollow Metal Mouldings, Metal Covered Mouldings, Elevator Enclosures, etc., and for the production and fabrication in Bronze, Aluminum and Nickel Silver of all kinds of Plain and Ornamental Work.

Facilities

Four large modern up-to-date factories, fully equipped with modern machinery and manned by a staff of skilled artisans, craftsmen, and mechanics, are able to turn out work of superlative quality at minimum cost.

Engineering Service

We maintain an engineering staff which has had long experience in its field. We will esteem it a pleasure to co-operate with architects and owners to assist them in the solution of problems relating to our products and service.

Specifications have been prepared covering all our various products. We will be pleased to send copies of them to interested architects on request.

Recent Installations

We have supplied our products for the completion of some of the most prominent buildings in the United States. The names of some of these, together with the names of the architects responsible for their design, will be found on the pages following.

DESCRIPTION OF PRODUCTS

Hollow Steel Doors

Reliance Flush Type Hollow Steel Doors are fabricated from two sheets of either 16 or 18-gage straightened and leveled furniture steel, to which are welded on the inside surfaces vertical stiffener sections about 4½ ins. apart. The stiffener sections on opposite plates interlock. Horizontal stiffener channels are welded to plates at top and bottom of door. Flush type doors can be made 1¼ or 1¾ in. thick. Elevator doors are usually made 1¼ in. thick and hinged doors are usually made 1¾ in. in thickness. Fillers of "Insulite" are ordinarily provided for sound deadening.

Stiles and top rails of paneled doors are made from 18-gage cold rolled sheet steel having 20-gage interlocking panel moulding of same material. Bottom rail is made up of 18-gage sheet steel welded to a moulding cold rolled to profile similar to stiles. Joints between stiles and rails are welded. Top and bottom rail are each reinforced with two channel sections running full width of door and welded to rail plates and also to stiles.

Solid panels are usually built up from two outside thicknesses of furniture steel cemented on to a ¼-in. thick core of fire retardant material. Steel of 18-gage thickness is used for panels over 36 ins. wide and 20-gage for those under.

Where greater safety against burglarizing is desired than that afforded by the built-up panel described above, panels are made of 3/16 or ¼-in. thick steel plate.

Glazed panels have glass mouldings of cold drawn steel secured to stationary mouldings by countersunk oval headed screws. All glass mouldings are made into frames with welded joints. When doors are of flush type, mouldings are welded to plates. Muntins where required are of cold drawn interlocking shapes welded to stiles and rails. Mirror doors have panel in back of mirror of 18-gage steel.

Grilles are usually made of 14-gage perforated metal secured in place in the same manner as are glass panels.

Louvers are usually built of 18-gage metal welded together and are secured to doors either permanently by spot-welding or by means of screws.

Servidors, Ventidoors, Panelouvers, and other special features used in the construction of doors may be either delivered to our factories to be set by us or they may be delivered to the building and set by the erection contractor. In either case the doors will be properly prepared in the factory to receive them.

Astragal mouldings, where necessary, are of cold drawn steel welded or screwed into place as conditions may require.

Door Bucks, Jambs and Trim Separate or in Combination

Rough bucks are formed of 12 or 14-gage steel with corners welded. Reinforcements are usually welded to the head for openings more than 4 ft. 6 in. wide and angle spreaders are placed at the bottom. For knock-down shipment, jambs are provided with clip angles at top for easy assembly to heads.

Cabinet jambs are made of 16 or 18-gage metal and are attached to rough steel bucks by machine screws or to rough wood bucks by wood screws.

Combination bucks and jambs are fabricated from 12, 14 or 16-gage steel with corners coped or mitred and welded. Anchors, floor clip angles and spreaders are provided as for rough bucks where required. Transom bars of section shown on Plate No. 4 are welded to frames or attached by concealed clip angles. Mouldings of combination frames cannot be formed to any other profile than as shown on Plate No. 1.

Combination bucks, jambs and trim are fabricated from 14 or 16-gage steel rolled cold to the profile required. Trim portion is mitred and welded at corners and side members of jambs are coped and tenoned to heads. Where combination frames are to be used in other than block partition, special anchoring arrangements are provided. Transom bars are welded into place or supported on concealed clip angles.

Scribe mouldings are cold drawn of 18 or 20-gage steel mitred or coped at corners and are attached to construction by countersunk oval headed screws.

Elevator Enclosures

Doors, bucks and trim of elevator enclosures are built in the same manner as specified above. Other features are described below.

Stationary panels are constructed in the same manner as are doors and are permanently held in place by attaching to frames with bolts and screws.

Hanger housings are formed of 12-gage steel plates bent to form required. They are usually welded to head of door buck and bolted to angle supports.

Angle supports for supporting hanger housings, are usually built of structural angles extending from floor to floor and attached to the structural steel. Angles act as supports for operators or closers where used.

Housing covers are made of 12-gage metal and hinged or otherwise attached to hanger housings in such manner as to make inspection and oiling of hangers an easy matter.

Elevator enclosure frames, either of the rough or finished type, are usually supported on the sills and attached thereto by clip angles.

Elevator enclosure sills are usually of iron or bronze castings arranged with a non-slip type of surface and constructed to set upon and be bolted directly to the structural steel. Grooves for door guides are usually machined. Bumpers will be attached to sills.

Facias are usually formed of 16-gage steel and may be reinforced where necessary. They are usually attached to frames, angle supports and sills by tap screws, bolts, or concealed fittings. Facias can be formed of 12-gage steel if desired.

Bumpers—Bi-parting elevator doors are fitted with continuous rubber bumpers held in place by cold drawn mouldings. Other doors have rubber bumpers attached to doors with angle stops on sills.

Hardware and Hardware Reinforcements

All hollow metal work is morticed, drilled, tapped and reinforced at the factory for the reception of locks, butts and hinges or other morticed hardware.

Surface hardware such as closers, hooks, surface bolts, adjusters, etc., for which cut outs are not required are usually tapped and drilled for at the building by the erection contractor. Hardware for elevator openings, such as bar locks, pneumatic operators, door closers, rack and pawl devices, interlocks and strike plates are usually drilled and tapped for at the building by the elevator contractor.

Door locks, morticed bolts and other morticed hardware for hollow metal doors are usually delivered to our factory by others and applied by us before shipment.

Metal Covered Doors

We manufacture two distinct types of metal covered doors, the Alweld type door, and the ordinary kalamein type door.

The Alweld Door

The Alweld door is made in two distinct patterns, one having the stiles and rails welded to the panel with separate applied panel mouldings, and the other in which the mouldings are integral with the stiles and rails which are rabbeted to receive the panel. Labels can be furnished for loose moulding type if conditions of size and glass conform to Underwriters' requirements. Both types are made from special patent leveled furniture steel, galvanized iron or copper.

Stiles and rails are formed around white pine cores of 22 gage steel, 22 gage galvanized iron or 16, 18 or 20-oz. copper. On the loose moulding type the metal covering is formed with two upstanding abutting fins which are welded together.

Joints between metal on stiles and rails are of special construction and are welded.

Panels are usually made up of two sheets glued to a core of fire retardant material ¼ in. thick. Where fin construction is used for stiles and rails, edges of panels are welded to fins. Where stiles and rails have integral mouldings panel fits into rabbet provided in rails.

Mouldings which are applied are welded at corners and are attached by special fastenings. Profile of panel mouldings cannot be varied in any way from those shown on Plate No. 4.

Kalamein Type of Metal Covered Doors

The metal covered door is fabricated from stiles, rails and mouldings which have been formed by drawing a thoroughly dried white pine core and its casing of sheet metal simultaneously through a steel die. Metal covering may be of long terne kalamein sheets, copper, brass, bronze, aluminum or nickel silver.

Stiles and rails are morticed and tenoned together.

Seams and joints between adjoining edges of sheet metal are carefully soldered and scraped to a smooth even surface.

Mouldings to be used for metal covered doors of this type may be selected from a very large assortment, some of which are shown on Plate No. 4.

Edge and astragal mouldings not shown on details are available where required.

Metal Covered Mouldings and Trim

The profile of some of our metal covered mouldings are shown on Plate No. 4. These may have a covering of either kalamein metal, galvanized iron, copper, brass, bronze, aluminum or nickel silver.

We not only have one of the largest assortment of dies in the country from which mouldings can be quickly run, but we also have complete facilities for making such special dies as may be required for turning out mouldings to conform to architects special requirements.

Crating, Shipping and Erection

Wrapping and crating. All material for out of town shipment having baked on finish is carefully wrapped and crated.

Shipment is made by freight, unless otherwise specified.

Erection—We are prepared to execute contracts for the erection of our material wherever local customs or regulations do not prohibit our doing so.

In erecting our materials, especial care is taken to see that all work is erected plumb and true to line and grade. Rough bucks, frames, etc. are set and braced in position before partitions are built. The door cabinet jambs, casings, are erected after plastering has been completed and the floor spaces are broom clean.

Hollow Metal Doors of Bronze, Aluminum and Nickel Silver

Of the more simple designs are made up of extruded sections and plate. Stiles and rails are solidly welded together at all seams and joints and reinforced where necessary. Mouldings are usually of extruded section mitred at corners and attached by special fastenings. Panels may be of metal plate which may be plain etched or otherwise ornamented, or panels may be of cast metal with highly sculptured ornament. They are attached to stiles and rails by means of concealed fastenings.

Bronze door frames may be of plain extruded mouldings or they may be highly ornamented.

(*Continued on page A1216*)

A PARTIAL LIST OF THE BUILDINGS ON WHICH WE HAVE RECENTLY EXECUTED CONTRACTS

Ornamental Bronze

Bank Buildings

Operation and Location	Architect
City Bank-Farmers Trust Bldg., New York, N.Y.	Cross & Cross
New York Trust Co., Fifth Ave. and 57th St., New York City (Aluminum)	Cross & Cross
Lee-Higginson Bldg., Broad St., New York, N.Y.	Cross & Cross
Goldman-Sachs Bldg., Pine St., New York, N.Y.	A. F. Gilbert
Equitable Trust Co., 79th St. and 149th St. Branches, New York, N. Y.	A. F. Gilbert
Integrity Trust Co., Philadelphia, Pa.	Green & Lavelle

Commercial Buildings

International Tel. & Tel. Bldg., Broad and William Sts., New York, N. Y.	Louis S. Weeks
Chanin Bldg., New York, N. Y.	Sloan & Robertson
Squibb Bldg., New York, N. Y. (Nickel Silver)	Buchman & Kahn
N. Y. World-Telegram Bldg., New York, N. Y.	James William Thomas
90 John St., New York City	Springsteen & Goldhammer and Cross & Cross
57th St. and Lexington Ave., New York, N. Y.	Ely Jacques Kahn
Richard Hudnut Building, 693 Fifth Ave., New York, N. Y.	Ely Jacques Kahn
500 Fifth Avenue, New York, N. Y.	Shreve, Lamb & Harmon
Binghamton Telephone Bldg., Binghamton, N. Y.	Voorhees, Gmelin & Walker
New England Tel. and Tel. Bldg., Lynn, Mass.	Densmore, LeClear & Robbins
Franklin Square Bldg., Washington, D. C.	R. F. Beresford
One Cedar St., New York, N. Y.	Clinton & Russell

Hotels and Apartment Buildings

New Yorker Hotel, 34th St. and Eighth Ave., New York, N. Y.	Sugarman & Berger
Barbizon Plaza, 58th St. and Sixth Ave., New York, N. Y.	Laurence Emmons, Inc.
Hotel Pierre, New York, N. Y.	Schultze & Weaver
Majestic Hotel, New York, N. Y.	Irwin S. Chanin
Century Apartments, New York, N. Y.	Irwin S. Chanin
Eldorado Towers, New York, N. Y.	Margon & Holder and Emery Roth
San Remo Towers, New York, N. Y.	Emery Roth
Town House, 108 E. 38th St., New York, N. Y.	Bowden & Russell
Essex Hotel, 160 W. 59th St., New York, N. Y.	Frank Grad
Nurses' Home, Baltimore, Md.	Palmer & Lambin

Public Buildings

U. S. Post Office, Key West, Fla.	James A. Wetmore, Treas. Dept.
Administration Bldg. Post Office, Cristobal, Panama	Government Architect
North Station Development, Boston, Mass.	Funk & Wilcox Co.
Fire Association of Philadelphia	E. J. Matthewson
Rockland County Courthouse, N. Y.	Dennison & Hirons
D. A. R. Constitution Hall, Washington, D. C.	John Russell Pope
Essex County Courthouse, Newark, N. J.	Guilbert & Betelle
Free Library, Philadelphia, Pa.	Horace Trumbauer
Convention Hall, Atlantic City, N. J.	Lockwood, Greene & Co., Inc.
Public Ledger Bldg., Philadelphia (Second and Third Sections)	Horace Trumbauer
Rodin Museum, Philadelphia, Pa.	Paul P. Cret
Wanaque Water Works, Wanaque, N. J.	Fuller & McClintock

Theatre Buildings

Fox Theatre, Brooklyn, N. Y.	C. Howard Crane and Kenneth Franzheim
Fox Theatre, Detroit, Mich.	C. Howard Crane
Paramount Brooklyn Theatre, Brooklyn, N. Y.	C. W. & Geo. L. Rapp
Roxy Theatre, New York City	W. W. Ahlschlager

Hollow Metal Work

Bank Buildings

Operation and Location	Architect
City Bank Farmers Trust Building, New York	Cross & Cross
Golden-Sachs Building, Pine St., New York	A. F. Gilbert
First National Bank, Albany, N. Y.	Halsey, McCormack & Helmer

Commercial Buildings

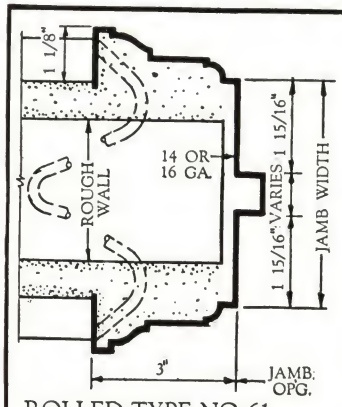
One Cedar Street, New York, N. Y.	Clinton & Russell
International Tel. & Tel. Building, New York, N. Y.	Louis S. Weeks
515 Madison Avenue, New York, N. Y.	J. E. R. Carpenter
116 John Street, New York, N. Y.	Louis Allen Abramson
80 Broad Street, New York, N. Y.	Sloan & Robertson
29 Broadway, New York, N. Y.	Sloan & Robertson
Public Ledger Building, Philadelphia, Pa.	Horace Trumbauer
Rector and Greenwich Streets, New York, N. Y.	L. A. Goldstone
41st Street and Broadway, New York, N. Y.	Ely Jacques Kahn
Eastman Kodak Works, Rochester, N. Y.	Eastman Kodak Co.
Standard Oil Building, Albany, N. Y.	Shreve, Lamb & Harmon
State Tower Building, Syracuse, N. Y.	Thompson & Churchill
Medical Arts Building, Atlanta, Ga.	G. Lloyd Preacher
Cincinnati Enquirer, Cincinnati, Ohio	Lockwood, Greene & Co.
American Insurance Union, Cleveland, Ohio	C. Howard Crane
Nix Professional Building, San Antonio, Tex.	H. T. Phelps
Western Union Building, Boston, Mass.	Stone & Webster
National City Bank, Buenos Aires, S. A.	Delano & Aldrich
Binghampton Telephone Building, Binghampton, N. Y.	Voorhees, Gmelin & Walker

Hotels and Apartment Buildings

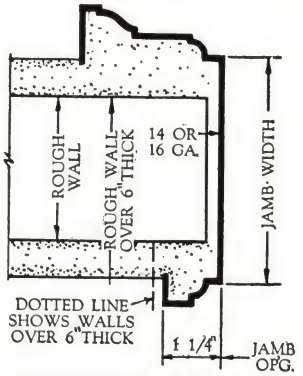
400 E. 57th Street, New York, N. Y.	Ballard, Goodwin & Franzheim
Hotel Pierre, Fifth Avenue and 61st St., New York, N. Y.	Schultze & Weaver
Nurses' Home, Baltimore, Md.	Palmer & Lambin
River House, 52nd St. and East River, New York, N. Y.	Bottomley, Wagner & White
London Terrace Apartment, 9th and 10th Avenues, New York, N. Y.	Farrar & Watmough
Mayflower Hotel, Washington, D. C.	Warren & Wetmore and R. F. Beresford, Assoc.
Majestic Apartments, 115 Central Park West, New York, N. Y.	Irwin S. Chanin
Century Apartments, 30 Central Park West, New York, N. Y.	Irwin S. Chanin
Astor Apartments, E. 86th St. and Eighth Ave., New York, N. Y.	Charles A. Platt
67th St. and Park Avenue, New York, N. Y.	Andrew J. Thomas
834 Fifth Avenue, New York, N. Y.	Rosario Candela
120 East End Avenue, New York, N. Y.	Charles A. Platt
56th St. and Eighth Avenue, New York, N. Y.	Farrar & Watmough
Princess Hotel, Pembroke, Bermuda	Clinton Mackenzie
Tilden Garden Apartments, Washington, D. C.	M. & R. B. Warren

Public Buildings

D. A. R. Building, Washington, D. C.	John Russell Pope
Julliard School of Music, 122nd Street and Broadway, New York, N. Y.	Shreve, Lamb & Harmon
Sterling Memorial Library, New Haven, Conn.	James Gamble Rogers
Institute of Human Relations, New Haven,	Grosvenor Atterbury
Columbia-Presbyterian Hospital: Hospital Building, Surgeons' and Physicians' Building, Out Patients' Pavilion, Private Patients' Pavilion, Nurses' Home, Babies' Home, Psychiatric Pavilion	James Gamble Rogers H. C. Pelton



ROLLED TYPE NO. 61
JAMB WIDTH 4 3/4" TO 15 3/4"
STOP VARIES
ROUGH WALL 3" TO 14"



ROLLED TYPE NO. 65
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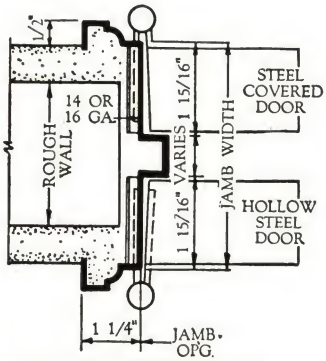
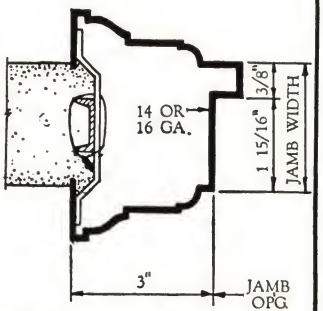
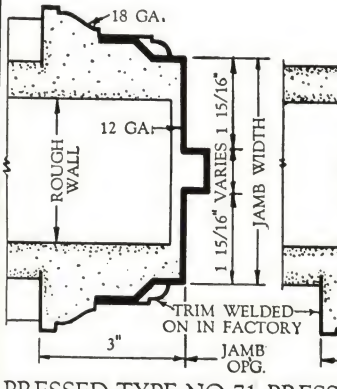
ROUGH WALL 3" TO 14"



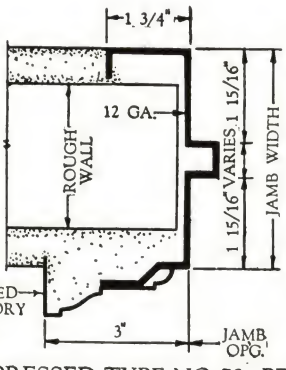
ROLLED TYPE NO. 66
JAMB WIDTH 4 3/4" TO 15 3/4"
STOP VARIES
ROUGH WALL 3" TO 14"



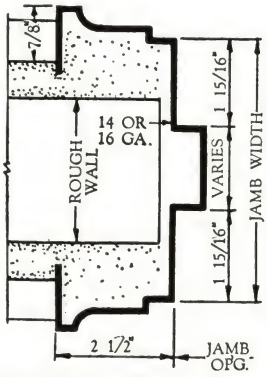
ROLLED TYPE NO. 6102 1/4
FINISHED WALL 2" OR 2 1/2" ONLY
DOOR THICKNESS 1 3/4"



PRESSED TYPE NO. 71
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP



PRESSED TYPE NO. 72
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP



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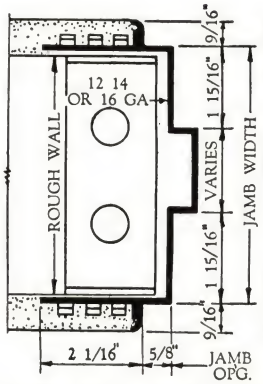
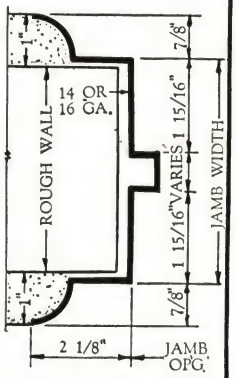
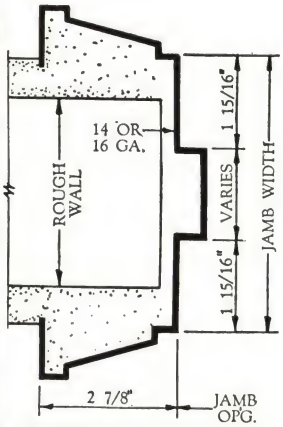
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP



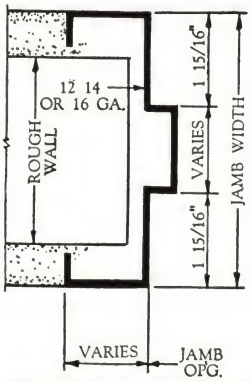
PRESSED TYPE NO. 81
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP



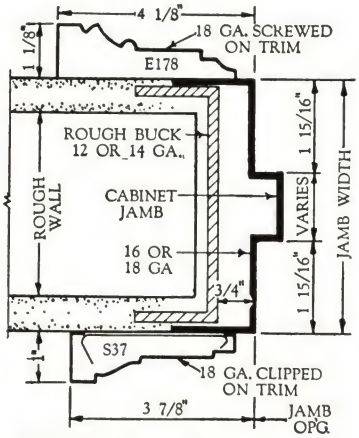
PRESSED TYPE NO. 80
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP



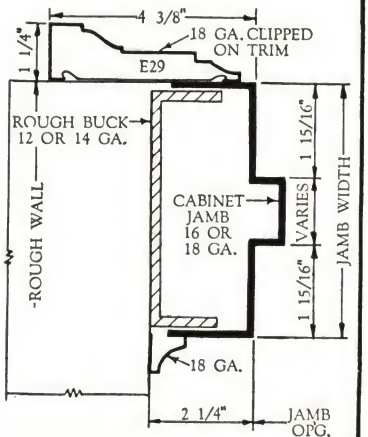
PRESSED TYPE NO. 92
JAMB WIDTH 4 3/4"-5 3/4"-7 3/4"
STOP 7/8"-1 7/8"-2 7/8"
ROUGH WALL 3"-4"-6"



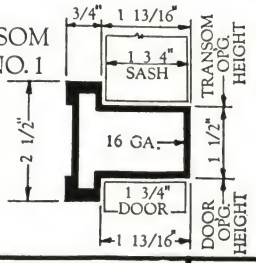
PRESSED TYPE NO. 73
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP

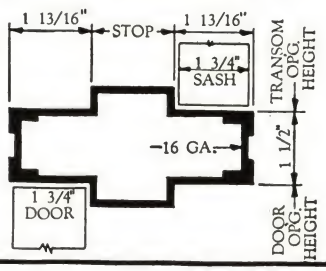


PRESSED TYPE NO. 90
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP



PRESSED TYPE NO. 91
JAMB WIDTH VARIES
STOP VARIES
ROUGH WALL 3" & UP



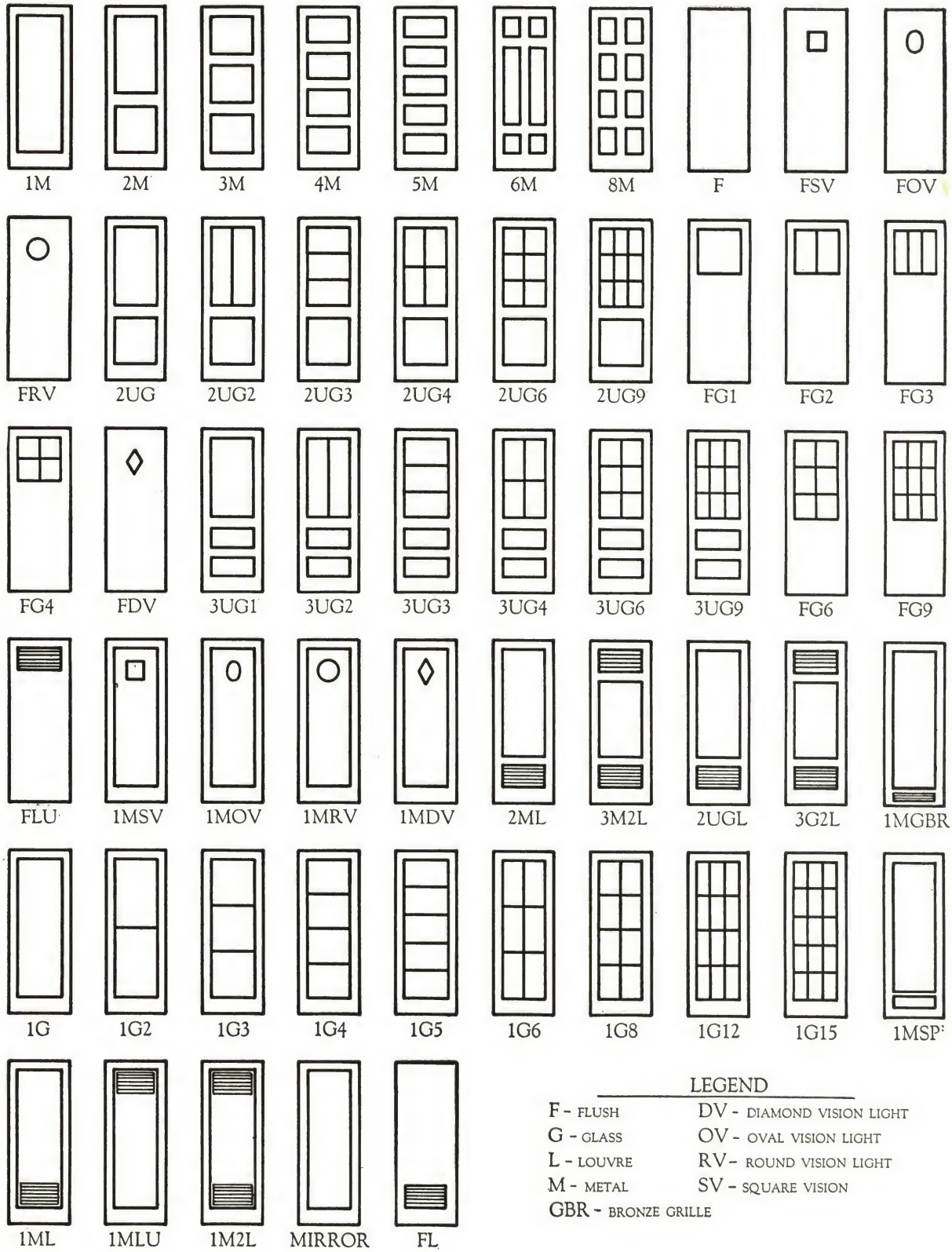


UNLESS OTHERWISE SPECIFIED WE WILL FURNISH ALL BUCKS WITH CLIP ANGLES AT BOTTOM FOR FASTENING TO FLOOR, 3/4" x 3/4" ANGLE SPREADERS AND SIX (6) No. 5 GA. WIRE ANCHORS 9" LONG.

ALL DRILLING AND TAPPING FOR MORTISE HARDWARE WILL BE DONE AT FACTORY.

ALL DRILLING & TAPPING FOR DOOR CHECKS, CHECK BRACKETS, TRANSOM ADJUSTERS AND FLUSH BOLTS FOR PAIR OE DOORS TO BE DONE BY ERECTION CONTRACTOR.

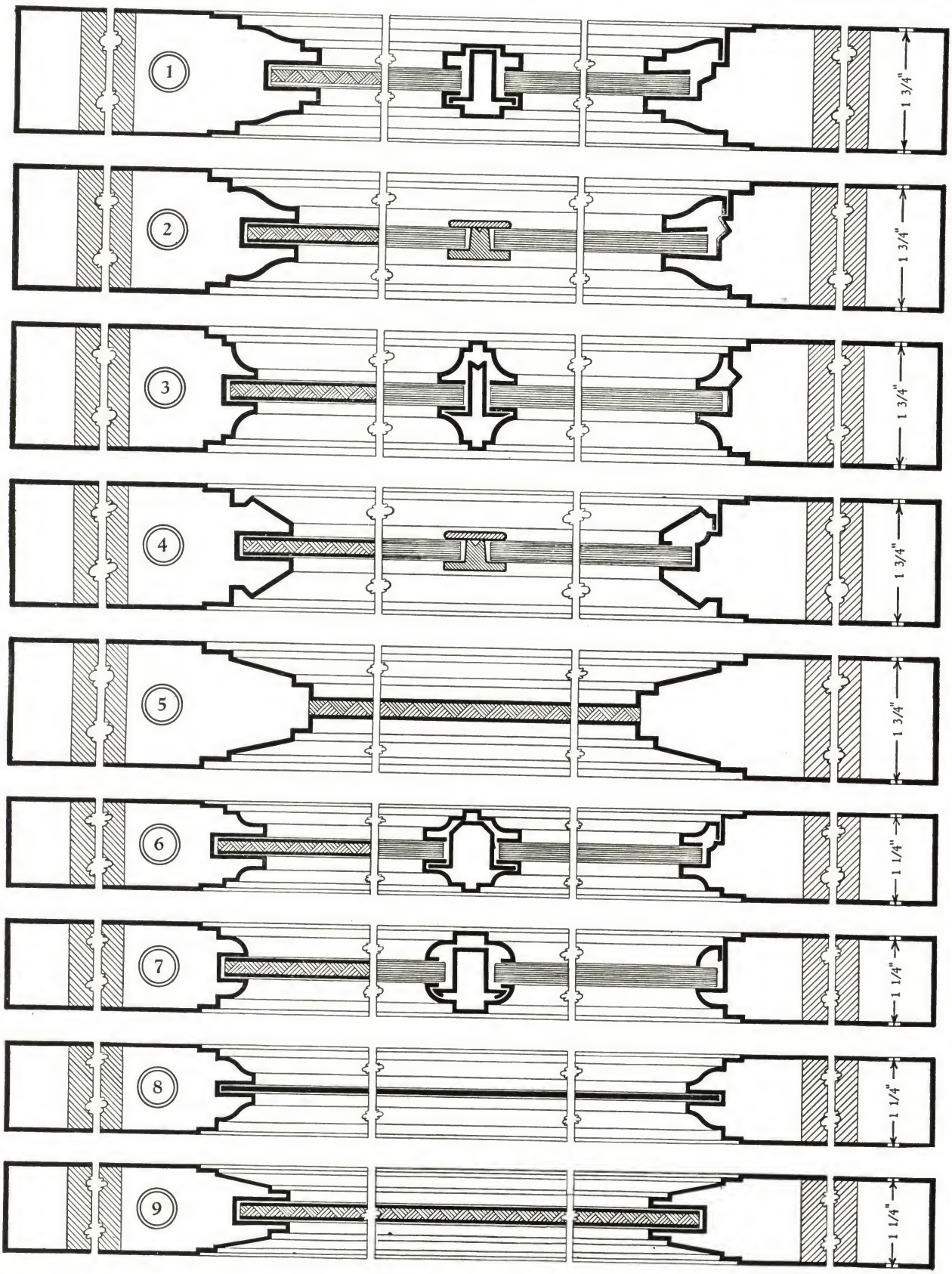
RELIANCE BRONZE & STEEL CORPORATION	STANDARD DETAIL OF DOOR FRAMES	PLATE NO. 1



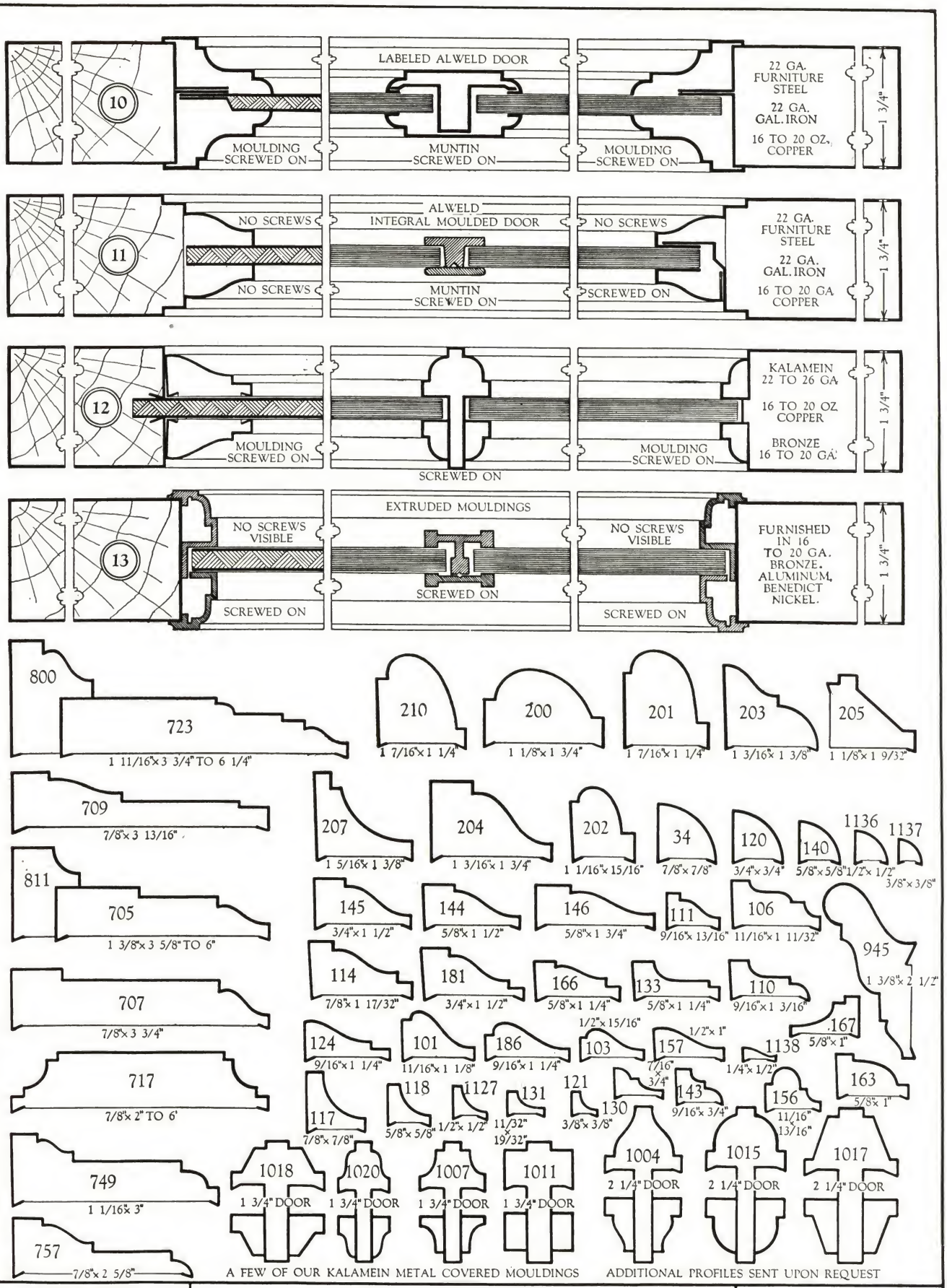
LEGEND

F - FLUSH	DV - DIAMOND VISION LIGHT
G - GLASS	OV - OVAL VISION LIGHT
L - LOUVRE	RV - ROUND VISION LIGHT
M - METAL	SV - SQUARE VISION
GBR - BRONZE GRILLE	

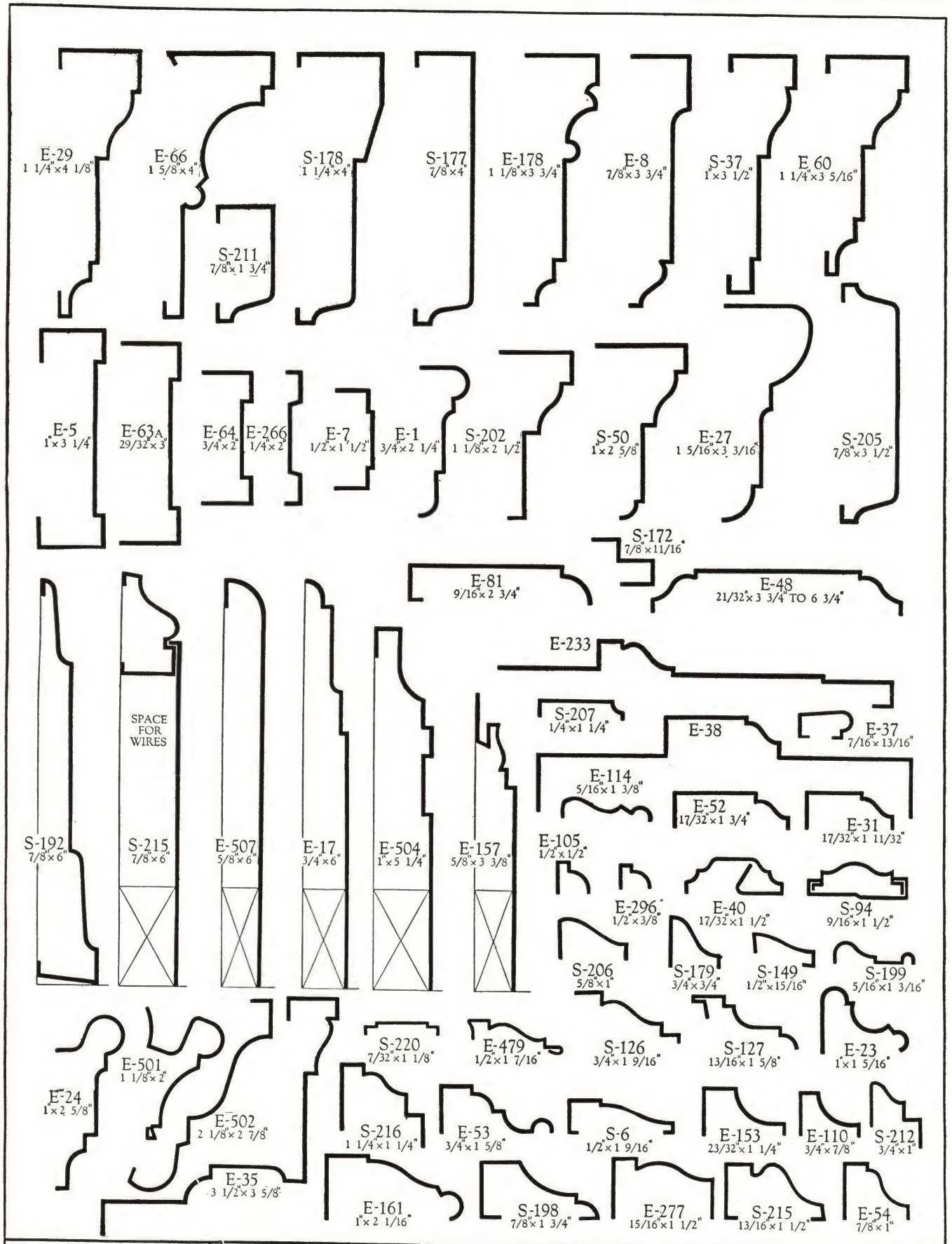
RELIANCE BRONZE & STEEL CORPORATION	STANDARD DOOR DESIGNS	PLATE NO. 2



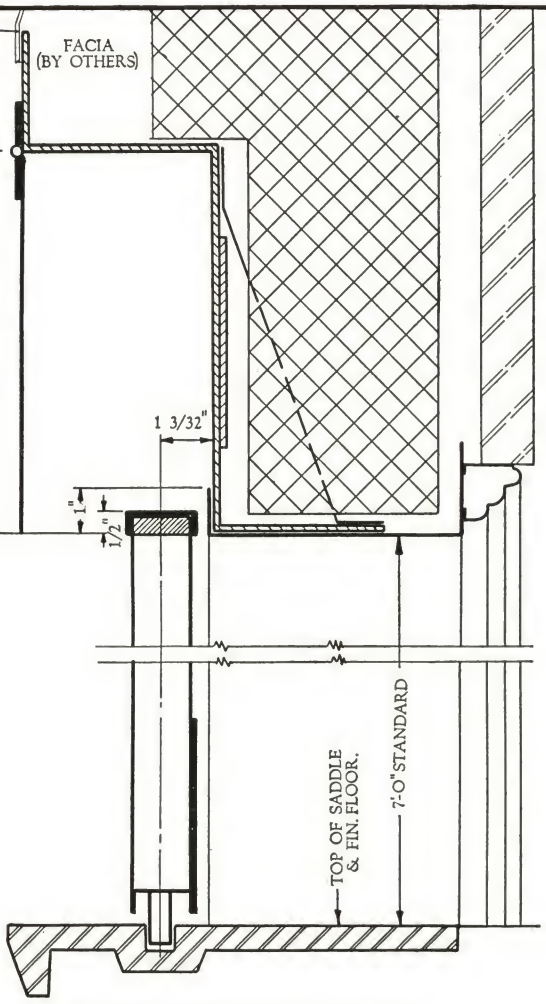
RELIANCE BRONZE & STEEL CORPORATION	DETAILS OF HOLLOW METAL DOORS	PLATE NO. 3



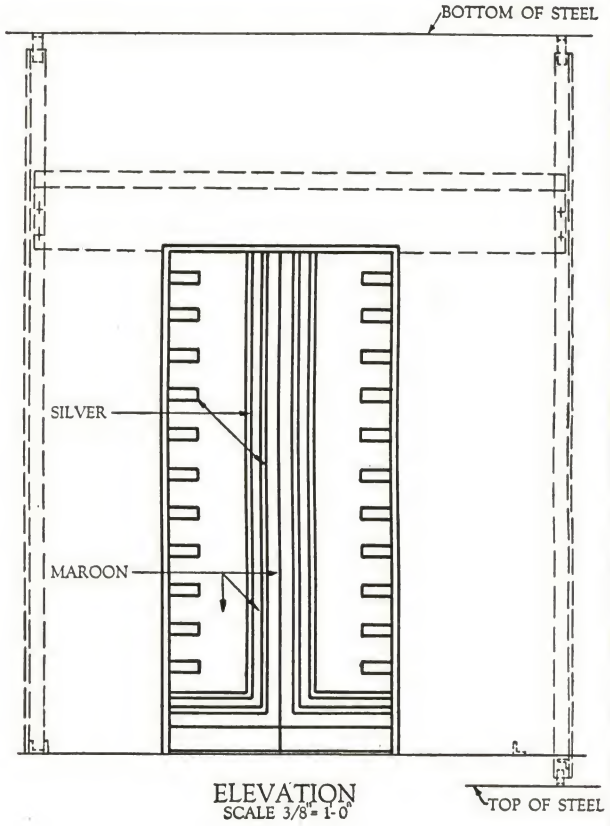
RELIANCE BRONZE & STEEL CORPORATION	METAL COVERED DOORS AND KALAMEIN MOULDINGS	PLATE NO. 5



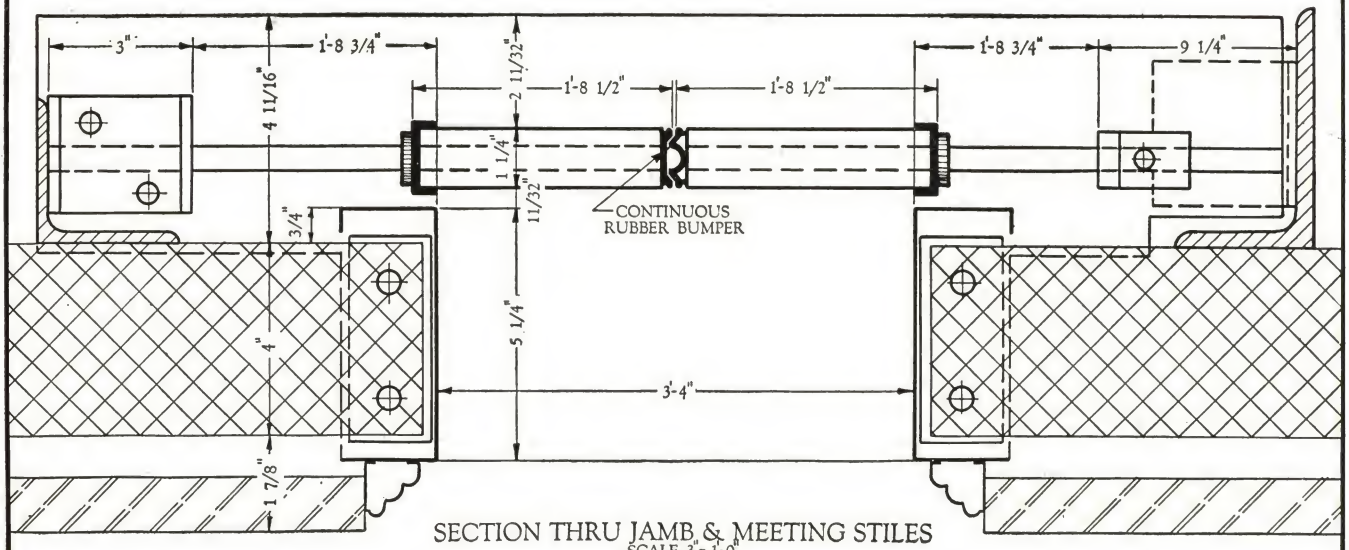
RELIANCE BRONZE & STEEL CORPORATION	DETAILS OF HOLLOW METAL MOULDINGS	PLATE NO. 5



SECTION THRU HEAD & SILL
SCALE 3"= 1'-0"

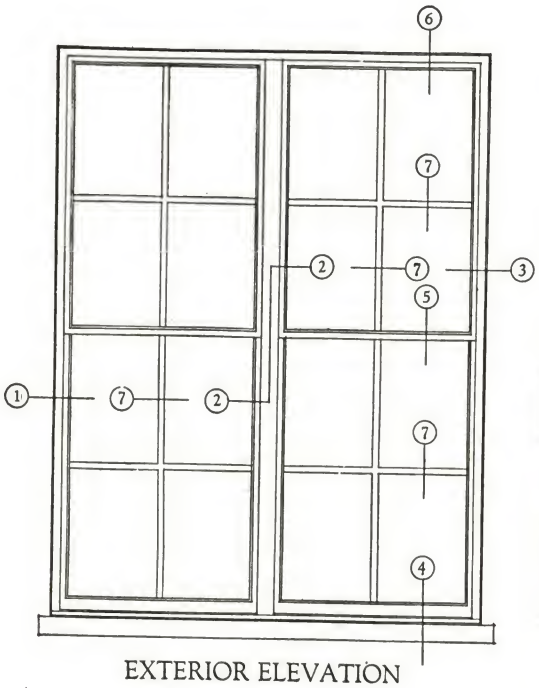


ELEVATION
SCALE 3/8"= 1'-0"

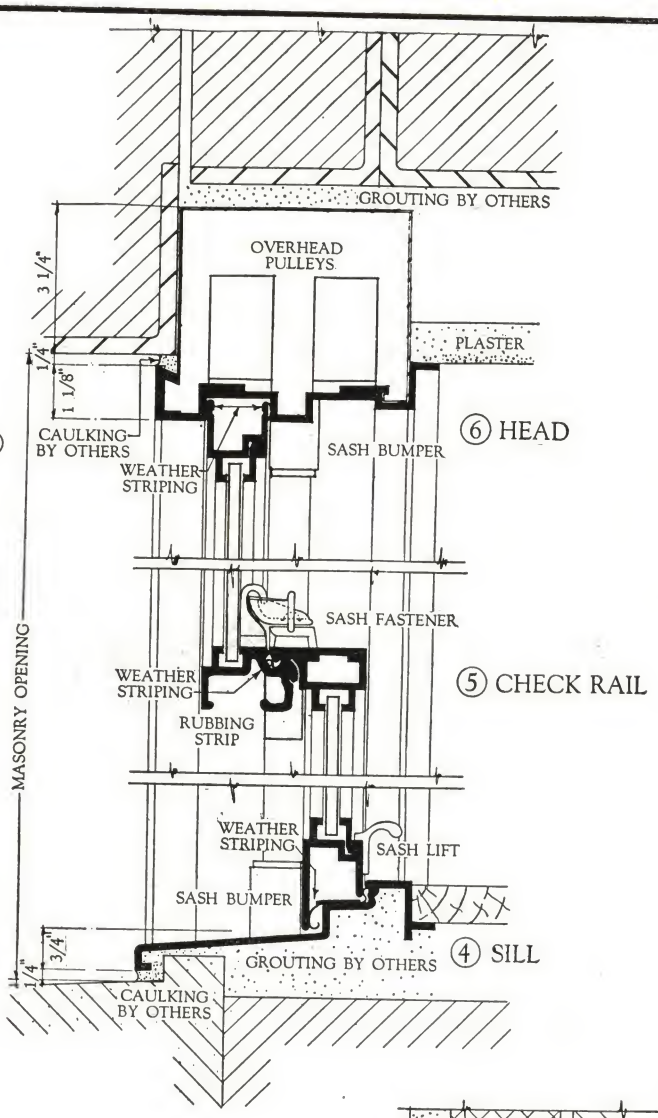


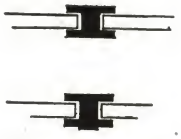
SECTION THRU JAMB & MEETING STILES
SCALE 3"= 1'-0"

RELIANCE BRONZE & STEEL CORPORATION	STANDARD DETAILS OF ELEVATOR ENTRANCE WITH BI-PARTING DOORS	PLATE NO. 6

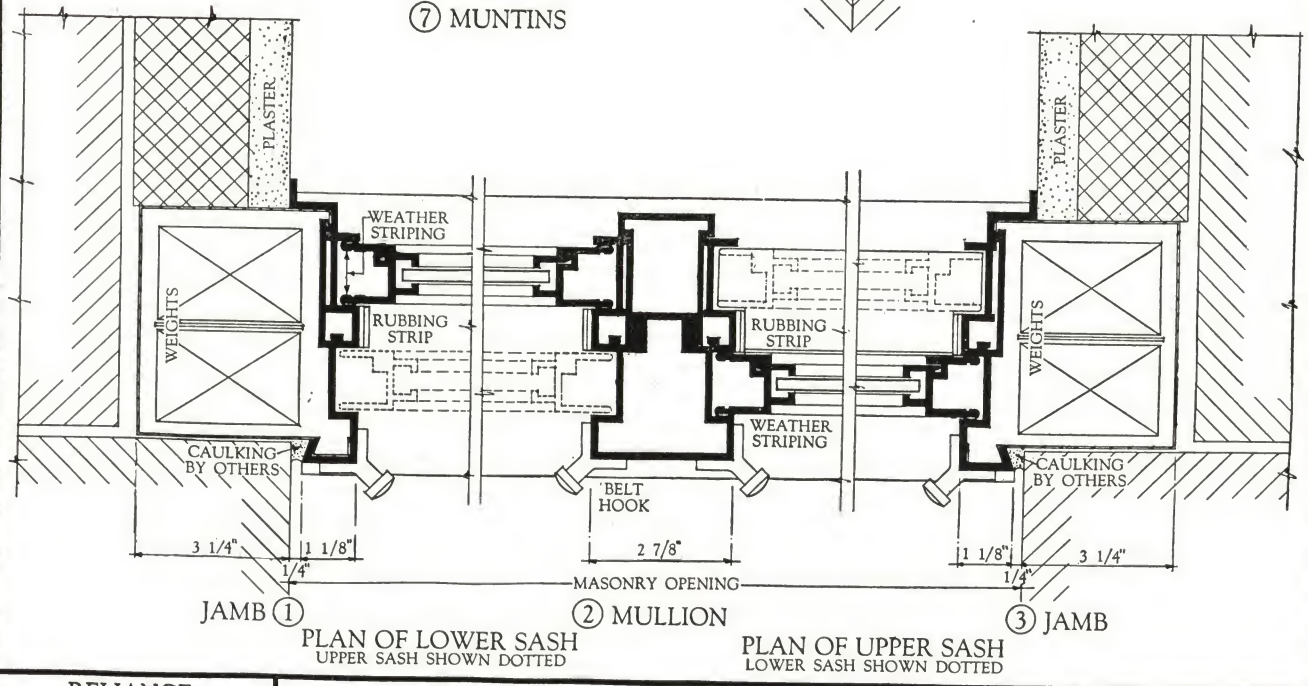


EXTERIOR ELEVATION





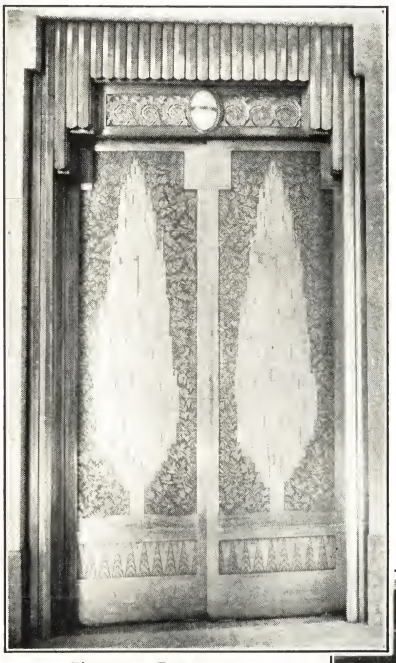
7 MUNTINS



PLAN OF LOWER SASH
UPPER SASH SHOWN DOTTED

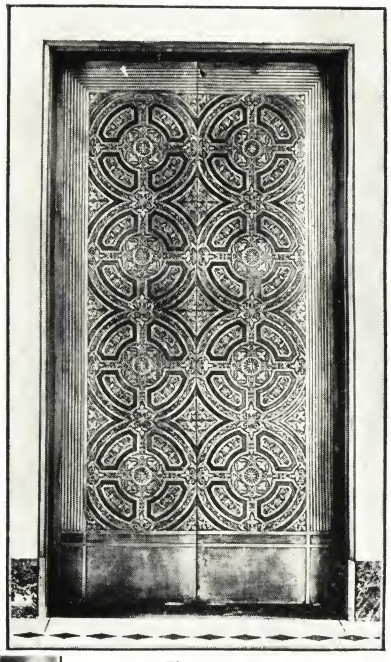
PLAN OF UPPER SASH
LOWER SASH SHOWN DOTTED

RELIANCE BRONZE & STEEL CORPORATION	DOUBLE HUNG WINDOWS TYPE "C" ALUMINUM OR BRONZE	PLATE NO. 7



Elevator Entrance
Building at No. 1 Cedar Street
New York
CLINTON AND RUSSELL, Architects

Industrial National Bank
New York
SUGARMAN AND BERGER, Architects



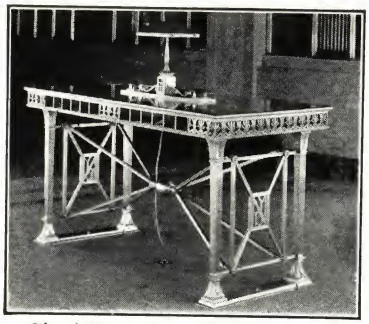
Elevator Entrance
International Telephone and
Telegraph Building, New York
LOUIS S. WEEKS, Architect

Kodak Store, Squibb Building
Fifth Avenue, New York
R. B. SHERBURNE, Architect

Town House Hotel, New York
BOWDEN AND RUSSELL, Architects

Bank Screen, Fifth Avenue Office
New York Trust Company
CROSS AND CROSS, Architects

National City Farmers Loan Building, New York
CROSS AND CROSS, Architects

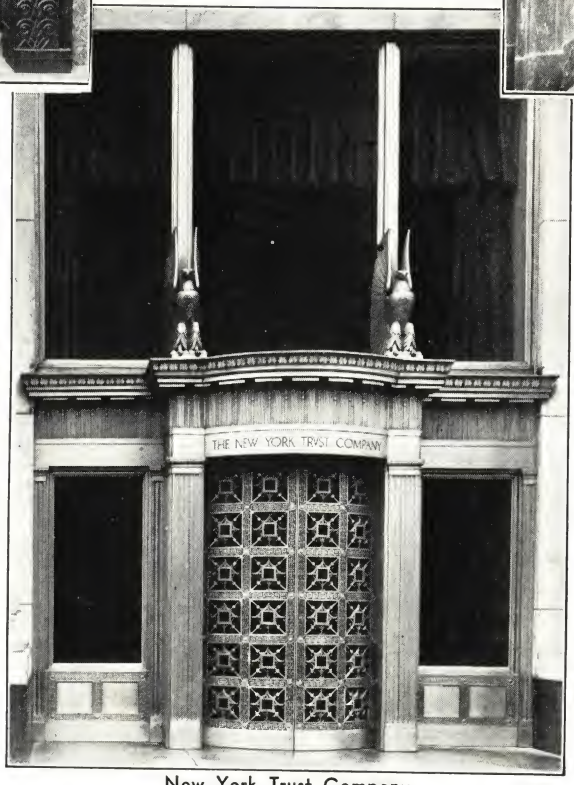


Check Desk—New York Trust Co.
CROSS AND CROSS, Architects

Manufacturers Trust Co., New York
SUGARMAN AND BERGER, Architects

Integrity Trust Co., Philadelphia
RITTER AND SHAY, Architects

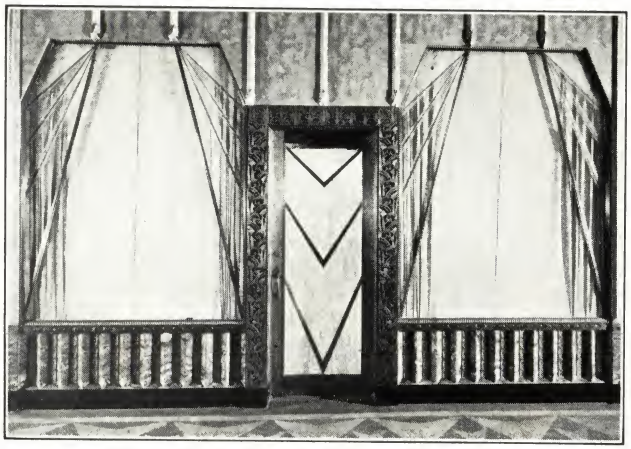
Stair Railing
Schwarz, Toy Store, New York
HARRY M. CLAWSON, Architect



New York Trust Company
CROSS AND CROSS, Architects

Bank Screen
Lee Higginson and Co., New York
CROSS AND CROSS, Architects

National City—Farmers Loan Bldg.
New York
CROSS AND CROSS, Architects



Store Front—Chanin Building, New York
SLOAN AND ROBERTSON, Architects

National City—Farmers Loan Bldg.
New York
CROSS AND CROSS, Architects

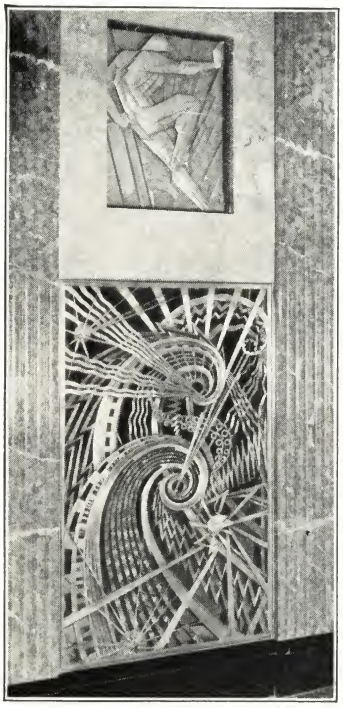
Bronze and Aluminum Double Hung and Casement Windows

Bronze and aluminum make ideal materials to use for the fabrication of windows. Highly ornamental and permanently non-corrodible, these metals when properly designed and fabricated make windows which are permanently ornamental and weatherproof and require a minimum of attention to maintain perfect operation.

For monumental buildings or those portions of other buildings which are to be occupied by those desiring equipment of the highest quality, reliability and permanence, Reliance Windows, of either the double hung or casement type, can be depended upon to meet fully the requirements.

Monumental Windows and Window Grilles

For special ornamental windows in bank buildings or buildings of monumental type, and bronze and aluminum windows of special design and construction are so far superior to windows made of iron and steel, that the increased cost of the bronze or aluminum construction is negligible, especially where the cost of maintaining the appearance of the window through periodic painting and decorating is considered.



Grilles and Plaque in Main Lobby, Chanin Building, New York
SLOAN & ROBERTSON, Architects

Cast Bronze Stair Rail, Manger Hotel, Boston, Mass.
FUNK & WILCOX, Architects

Traffic Signal Standard, Fifth Avenue, New York
JOSEPH H. FREEDLANDER, Architect

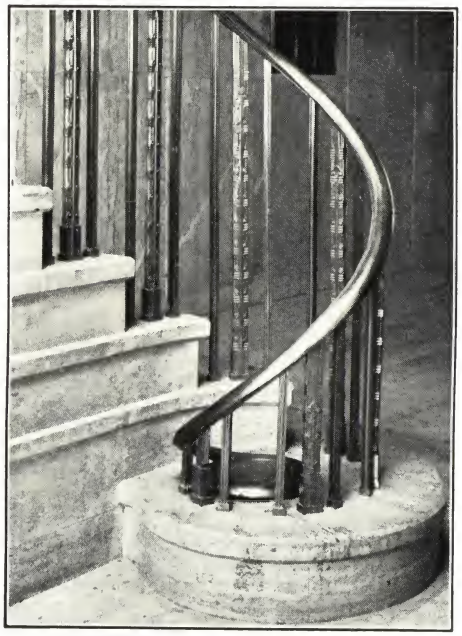
Store Fronts and Building Entrances

We have especially complete facilities for executing architects' designs for fine individualist store fronts in bronze, aluminum, or nickel silver. Designs of the more simple character are usually made from extruded shapes while those of more elaborate design may be cast or fabricated from a combination of castings, extruded and wrought material. In order to secure contrasts in colors, alloys of different composition may be effectively combined in the same composition. This, of course, can be accomplished by our plants without special effort.

Statuary and Sculptured Work

We have complete equipment for the production of bronze castings by either the French Sand or Cirè Perdue (Lost Wax) processes. Castings are afterwards chased, filed, rubbed and finished by experts in their respective lines.

Grilles and Plaque in Main Lobby, Chanin Building, New York
SLOAN & ROBERTSON, Architects



Nickel-Silver Handrail, Schwartz Store, New York
HARRY M. CLAWSON, Architect

THE L. SCHREIBER & SONS CO.

ESTABLISHED 1854

Ornamental Iron and Bronze

Box 18, Evanston Station
CINCINNATI, OHIO

For our page on Steel Stairs, see Manufacturers' Index

Products

Manufacturers of ORNAMENTAL IRON and BRONZE of every description.

We also have a separate plant for fabrication of Structural Steel.

Organization

All branches of the work are carried out within our own plant; having modeling shop, and pattern shop for either wood, plaster or metal patterns as well as a foundry for the production of iron or any of the non-ferrous metal castings. As we have been operating thus for 75 years, careful and efficient co-operation may be relied upon.

Service

We are pleased to furnish estimates or consultation service at any time.

REVERE COPPER AND BRASS INCORPORATED

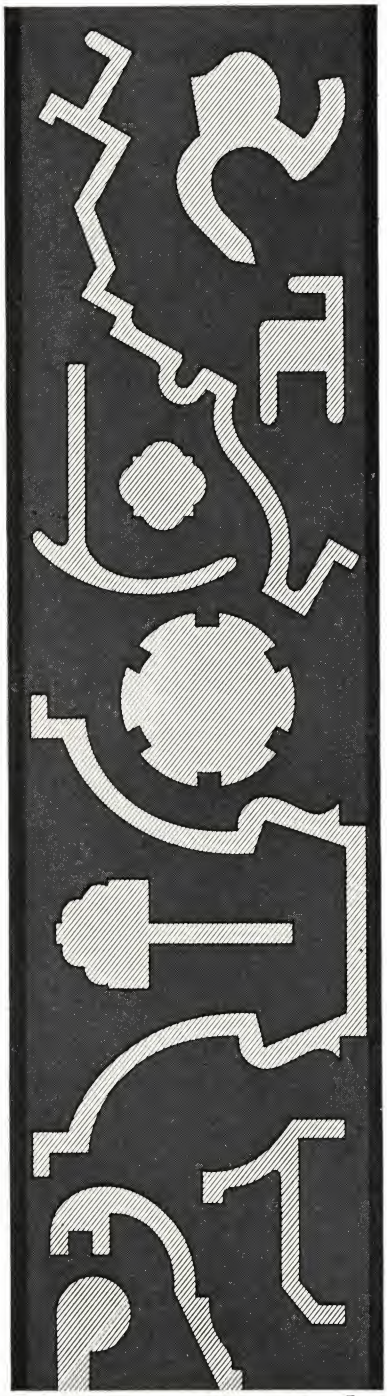
EXECUTIVE AND GENERAL SALES OFFICES
230 Park Avenue, NEW YORK, N. Y.
GENERAL OFFICES: ROME, N. Y.

DIVISIONS

BALTIMORE DIVISION, Baltimore, Md.
DALLAS DIVISION, Chicago, Ill.
ROME DIVISION, Rome, N. Y.
TAUNTON-NEW BEDFORD DIVISION, Taunton, Mass.
HIGGINS DIVISION, Detroit, Mich.
MICHIGAN DIVISION, Detroit, Mich.

SALES OFFICES

NEW YORK, N. Y., 75 East 45th Street
BOSTON, MASS., 20 Providence Street
PHILADELPHIA, PA., 123 South Broad Street
PITTSBURGH, PA., 2137 Koppers Building
MILWAUKEE, WIS., 229 East Wisconsin Avenue
CLEVELAND, OHIO, 917 Midland Bank Building
CINCINNATI, OHIO, 2616 Carew Tower



A Few Representative Revere Extruded Architectural Shapes in Cross Section
Illustrations are not to scale

Products

ARCHITECTURAL METALS in Sheets, Extruded and Drawn Shapes and Tubes; REVERE 60 BRONZE, REVERE 85 BRONZE, and REVERE 90 BRONZE SHEETS; NICKEL SILVER SHEETS; COPPER and BRASS SHEETS.

ARCHITECTURAL BRONZE, BRASS, COPPER, NICKEL SILVER and ALUMINUM EXTRUDED SHAPES, DRAWN SHAPES; BARS, CHANNELS, ANGLES; ROUND, SQUARE, RECTANGULAR and SPECIAL SHAPED TUBES for architectural use.

These materials are sold to fabricators of ornamental and structural metal work for use in doors, windows, entrances, counters, screens, grilles, hand rails, soffits, pilasters, cornices, etc.

For Revere Sheet Copper, Leadtex (Lead Coated Copper), Brass Pipe and PR Pipe, see Manufacturers' Index.

BRONZES FOR ARCHITECTURAL USE

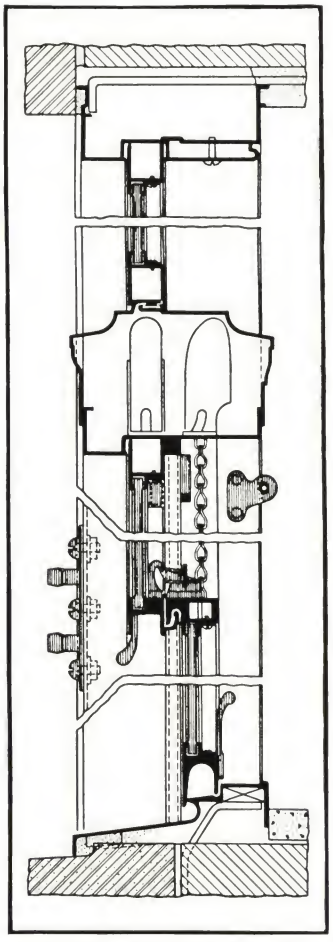
Sheets

Revere panel sheets are characterized by their flatness, fine finish and uniform color. They are offered in Revere 60 Bronze, Revere 85 Bronze and Revere 90 Bronze.

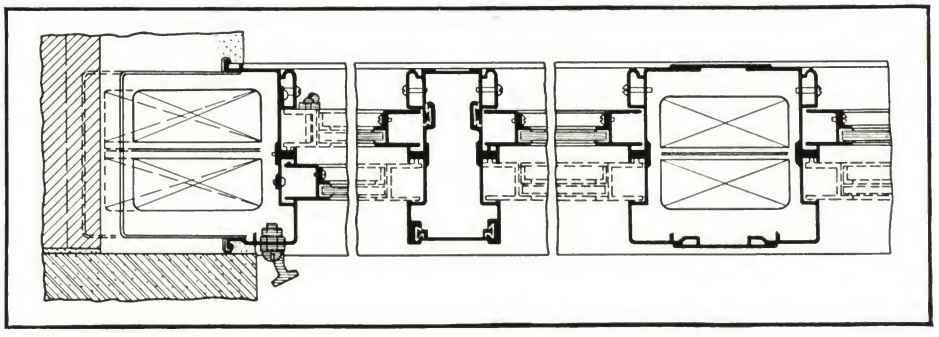
Revere 60 Bronze Sheets

Revere Copper and Brass Incorporated has more than a century of experience in the production of sheet metals. The sheets enjoy the highest reputation, and have no superior and are preferred by fabricators because of their flatness, fine finish, uniformity of surface and color as well as the ease with which they are formed.

Each step of their manufacture is closely checked and controlled by men of long experience in their production.



Details of Double Hung Window Illustrating Application of Revere Extruded Bronze Shapes
(Courtesy WM. H. JACKSON COMPANY)



Another advantage of Revere 60 Bronze sheets is the close color match obtained when they are used in connection with Revere Extruded Architectural Bronze Shapes.

Ample stocks of these sheets are carried in a large range of sizes and thicknesses for prompt shipment. In addition, Revere has facilities for producing sheets of extreme width and length, depending on the thickness required.

Revere 85 Bronze and Revere 90 Bronze Sheets

These sheets are recommended for use with drawn shapes and tubular sections of the same alloy, color match being thus assured.

Revere Extruded Architectural Bronze Shapes

Extruded architectural shapes are particularly adapted for the construction of entrances, doorways, store fronts, grilles and windows.

These shapes are uniform and accurate in size. As compared to castings, Revere extruded shapes are stronger and lighter; also the cost of finishing them is much less and at the same time rejections are reduced to a negligible factor. The average tensile strength is in excess of 45,000 pounds to the square inch.

Revere has facilities and experience for producing these shapes in plain or intricate design in commercial sizes up to and including six inches overall dimension and in usual lengths to as high as twenty feet. Great care is exercised in the straightening of Revere shapes which is a time-saver in fabricating.

Revere Extruded Architectural Bronze Shapes produce a good color match when used with Revere 60 Bronze Panel Sheets.

Drawn Shapes

Where light weight mouldings and shapes are required for use in interior trim, show cases, store fronts and other places, Revere drawn shapes are recommended.

Rods

Revere Rods for architectural purposes are furnished in the same mixtures as sheet metals and extruded shapes.

Tubes

Revere 85 Bronze is made in round, square, rectangular and special tube forms for architectural purposes such as stiles, railings, and balustrades.

Nickel Silver Sheets and Extruded Shapes

Where a white metal with unusually fine surface and finish is desired, Revere Nickel Silver serves a definite architectural purpose.

This material is furnished in both sheet and shape form, making possible an absolute match in color and finish.

Nickel Silver Extruded Architectural Shapes can be supplied up to six inches wide and not less than one-eighth inch in thickness.

Samples

Samples of the various architectural metals described above will be gladly sent upon request.

Co-operation

Any of the Revere mills or branch offices listed on the preceding page are at the service of architects at all times. As a further service to those engaged in the design and fabrication of architectural metals an Architectural Bronze Department is maintained which offers full co-operation in furnishing estimates covering the cost of Extruded Shapes and in determining the suitability of these shapes for various purposes.

Brooklyn Savings Bank, Brooklyn, New York
HALSEY, MCCORMACK and HELMER, Architects
Bronze circle head window fabricated from Revere Extruded Architectural Bronze Shapes
(Courtesy WM. H. JACKSON COMPANY)

Stone & Webster Building—New York
CROSS and CROSS, Architects
Illustrating the use of Revere Extruded Architectural Bronze Shapes in entrance and windows
(Courtesy WM. H. JACKSON COMPANY)

Etched Bronze Elevator Doors made of Revere 60 Bronze Panel Sheets and Extruded Shapes
(Courtesy of GENERAL BRONZE CORP.)

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REPRESENTATIVES: Shults Engineering Co., Morgan Building, Buffalo, N. Y.—Telephone, Washington 3888

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- Store Fronts, cast and wrought iron and also aluminum and K-A-2 metal.
- Elevator Fronts; Gates and Railings.
- Bank Screens and Check Desks, in cast and wrought iron
- Lamp Standards and Fixtures.
- Marquises.

MISCELLANEOUS IRON WORK, including:

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- Circular Stairs; Gratings.
- Doors and Door Bucks

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Thoroughly equipped estimating and draughting departments, as well as a special designing department for ornamental work, are at the service of architects.

Estimates and suggestive working details will be gladly submitted on request.

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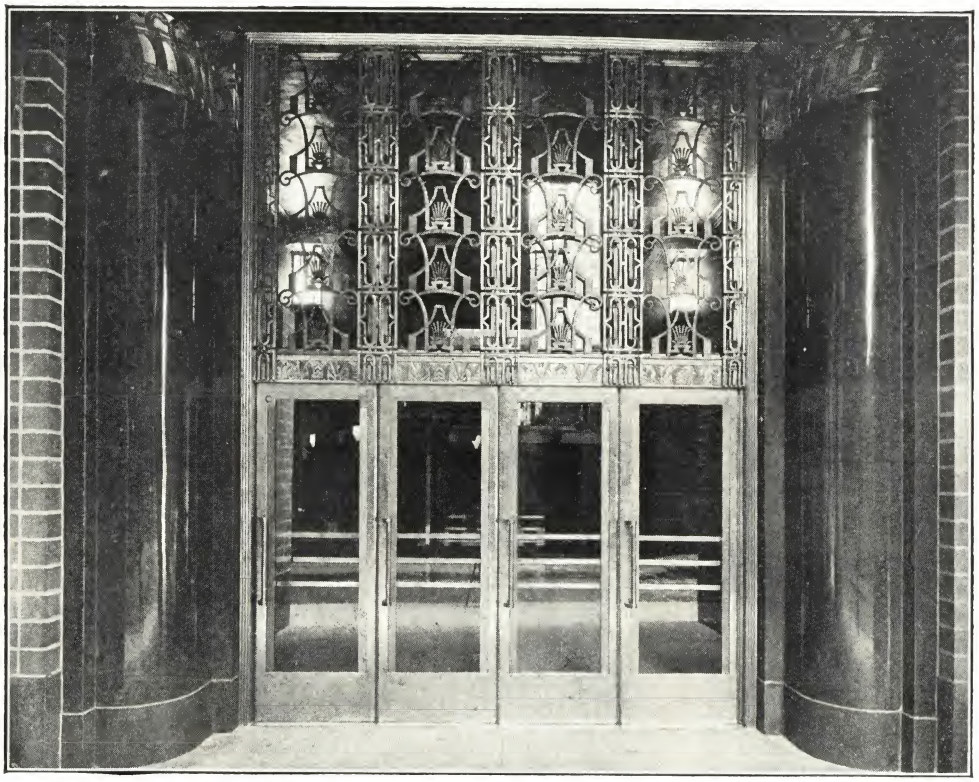
Our plant is complete in every respect and equipped with the most modern types of machinery and tools, enabling this organization to meet promptly and efficiently all demands for its products.

Our plant is situated at the East River and provided with own docking facilities.



Entrance Doors and Grilles of K-A-2 Chrome Nickel Steel and Bronze, 21 West Street, New York, N. Y.
STARRETT & VAN VLECK, Architects

Recent Installations of Ornamental and Miscellaneous Iron, Aluminum and Bronze Work

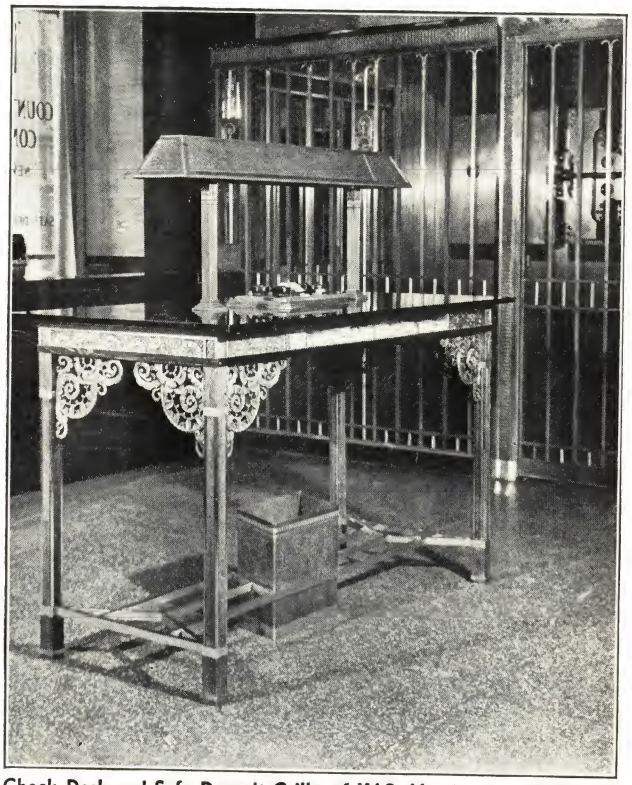
New York, N. Y.

Chrysler Building, Lexington Avenue, 42nd-43rd Streets
Daily News Building, Second Avenue, 41st-42nd Streets
Salmon Tower Addition, 500 Fifth Avenue
Apartment Building, 740 Park Avenue
River House, 52nd-53rd Streets and East River
Cities Service Building, Pine, Pearl and Cedar Streets
City Bank-Farmers Trust Building, William, Beaver and Hanover Streets
New York Central Office Building and Overhead Bridge, Park Avenue and 45th Street
Beaux Arts Building, 312-13 East 44th Street

Other Cities

Harvard College, Indoor Athletic Building, Cambridge, Mass.
Lee, Higginson & Co.'s Bank and Office Building, Boston, Mass.
Buffalo Courier-Express Building, Buffalo, N. Y.
Buffalo City Hall, Buffalo, N. Y.
First Stamford National Bank, Stamford, Conn.
Amos Tuck School, Dartmouth College, Hanover, N. H.
Farmers' Trust Building, Lancaster, Pa.
First National Bank & Trust Company, Greenfield, Mass.
National Savings Bank, Albany, N. Y.
Union New Haven Trust Company, New Haven, Conn.

Aluminum and Bronze Stair Rail, Silver House, Pearl and Moore Streets, New York, N. Y.
WARREN & WETMORE, Architects



Check Desk and Safe Deposit Grille, of KA2, Aluminum and Wrought Iron, County Trust Company, Empire State Building, New York, N. Y.
W. WHITEHILL, Architect

Mail Box, Radiator Grille and Elevator Door of KA2 Chrome Nickel Steel and Bronze, 21 West Street, New York, N. Y.
STARRETT & VAN VLECK, Architects

Ornamental Stair Rail of Wrought Iron and Bronze, Cloud Club, Chrysler Building, New York, N. Y.
WILLIAM VAN ALEN, Architect

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Castings: Iron, Brass, Bronze
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Doors: Entrance, Sidewalk
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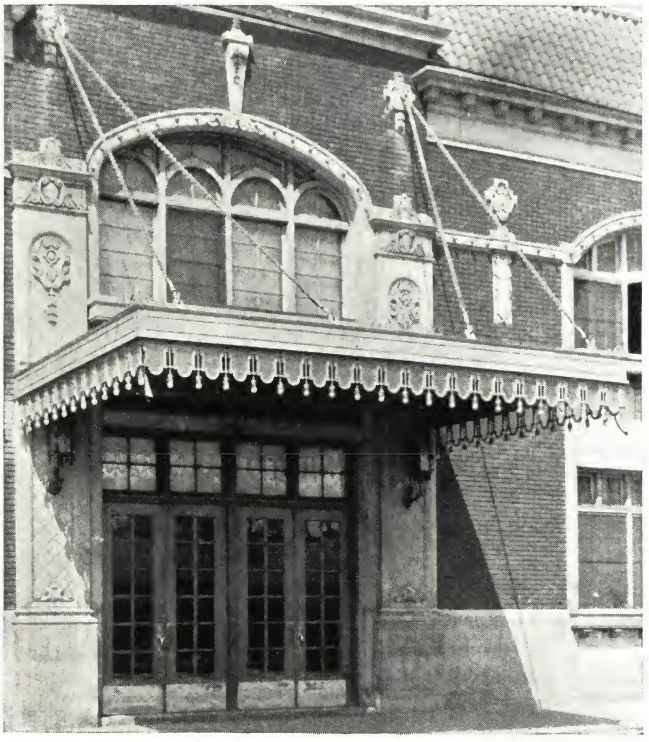
Entrances: Iron and Bronze
Fencing: Iron, Wire
Fire Escapes
Flagpoles: Steel
Fronts: Store, Building
Furniture: Metal Garden
Gates: Iron, Wire, Folding
Grilles
Guards: Iron and Wire—Window, Machinery, Skylight, Wheel, Stall
Jail Work
Lanterns
Lockers: Wire
Marquises
Partitions: Wire Mesh
Railings: Bank, Theater—Iron, Wire, Brass, Pipe
Signs: Wire, Bronze
Stable Fittings
Stairs: Iron
Tablets: Bronze
Vases: Iron
Weathervanes
Wickets
Wire Cloth, Screens and Netting

Catalogues

No. 100 General Catalogue.
No. 102 Weathervanes and Iron Lawn Furniture Booklet.
No. 103 Prison Folder.

Wrought Iron Fence, Gate, Arch and Lantern, Cast Iron Vase, and Wrought Steel Settee, on an Estate in Lake Forest, Ill.



Iron Marquise, Rainbo Gardens, Chicago, Ill.

Fire Escapes

For almost half a century we have been manufacturing and erecting fire escapes. Our counterbalanced stair is approved by the Building Department of the City of Chicago and by leading architects and engineers throughout the country. Our iceproof ladders and balconies and improved trussed stairs increase the effectiveness of our fire escapes. We are prepared to manufacture them in various types and designs according to state or city building requirements. We also make escapement stairs for mine shafts.

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These are excellent protection against damage and burglary. In our standard specification, they are made of No. 10 intermediate crimp steel wire, 1½-in. diamond mesh, securely clinched on either ⅜-in. round or 1-in. channel steel frames, but we can make guards of any size mesh, wire or frame practicable.

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We are one of the largest and oldest concerns in the country manufacturing stable fittings, such as wrought iron corner hay racks, heavy crimped wire or iron stall guards or partitions, corner mangers, water troughs, harness brackets and oats cleaners.

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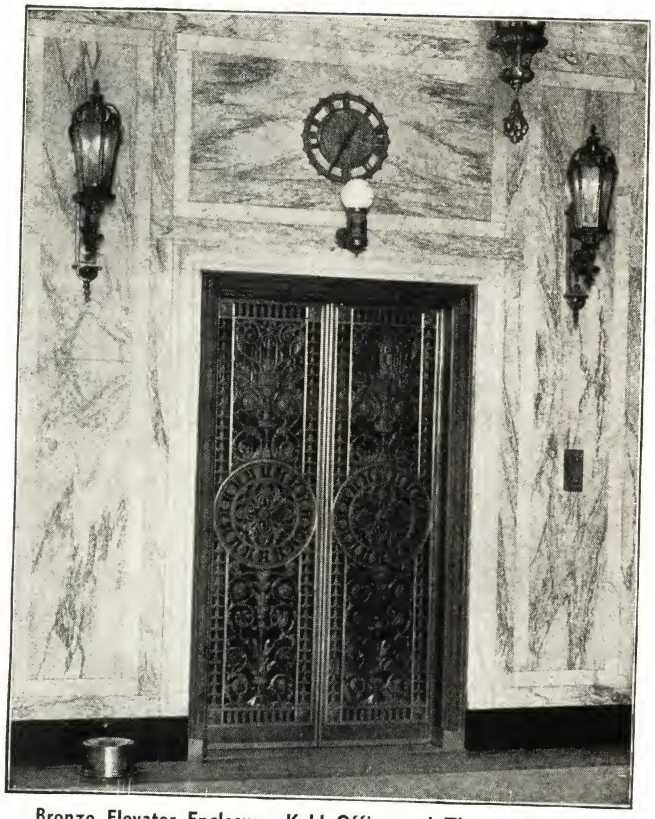
One of our major products is wire cloth. We always have a large stock on hand in our Chicago warehouse and we can furnish wire cloth in a variety of metals, such as steel, iron, tin-plated, galvanized, brass, bronze, copper, german silver, nickel, monel metal, aluminum and phosphor bronze. Wire cloth is particularly useful for ventilation and elimination of dust and for machinery and window guards.

Iron Stairs and Railings, 3rd to 15th Floors, Chicago Building, Chicago, Ill.
HOLABIRD & ROCHE, Architects



Bronze Elevator Enclosure, Kahl Office and Theater Building, Davenport, Iowa
C. W. and GEORGE L. RAPP, Architects

Partial List of Installations

BUILDING, LOCATION AND ARCHITECT

Post & Paddock Club House, Arlington, Ill., B. H. Marshall
Manchester Department Store, Madison, Wis., Law, Law & Potter
Western Theological Seminary, Evanston, Ill., Armstrong, Furst & Tilton
1500 Lake Shore Drive Building, Chicago, Ill., McNally & Quinn
American Bankers' Insurance Building, Chicago, Ill., Childs & Smith
American Insurance Union Building, Columbus, Ohio, C. Howard Crane
The Fair Department Store, Chicago, Ill., Mundie & Jensen
Marks Bros., Granada and Marbro Theaters, Chicago, Ill., Levy & Klein
National Theaters Corp., Paradise Theater, Chicago, Ill., John Eberson
Coronado Theater, Rockford, Ill., Frederic J. Klein
Shea's Theater, Buffalo, N. Y., C. W. and George L. Rapp
Chicago National League Ball Park, Chicago, Ill., Davis & Davis
Hippodrome Building, Cleveland, Ohio, Knox & Elliott
Chicago Athletic Association Building, Chicago, Ill., Schmidt, Garden & Erickson
Margarita Club, Evanston, Ill., Morrison & Wallace
Crane Co. Building, Chicago, Ill., Graham, Anderson, Probst & White
Milwaukee Journal Building, Milwaukee, Wis., Frank D. Chase, Inc.
Mayflower Hotel Building, Washington, D. C., Warren & Wetmore
Blackhawk Hotel, Davenport, Iowa, Temple & Burrows
U. S. Naval Training Station (15 buildings), Great Lakes, Ill. Jarvis Hunt
U. S. Post Office Buildings (more than 45)
Cosden Building, Tulsa, Okla., Henry F. Hoit
Sisters of Providence College and Music Building, St. Mary of the Woods, Ind., D. A. Bohlen & Son
Chicago Building, Chicago, Ill., Holabird & Roche
Monroe Building, Chicago, Ill., Holabird & Roche
Chas. Lange Building, Chicago, Ill., Clarence Hatzfeld

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For our pages on Exterior Lighting Fixtures of Cast Iron and Bronze, see Manufacturers' Index.

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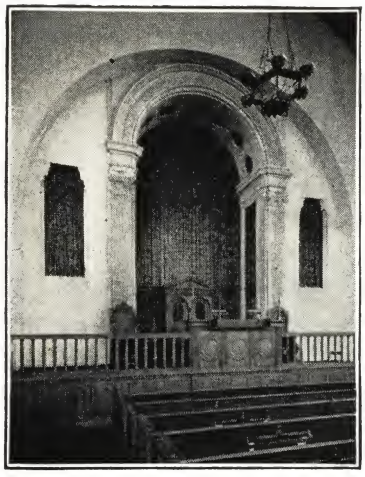
References

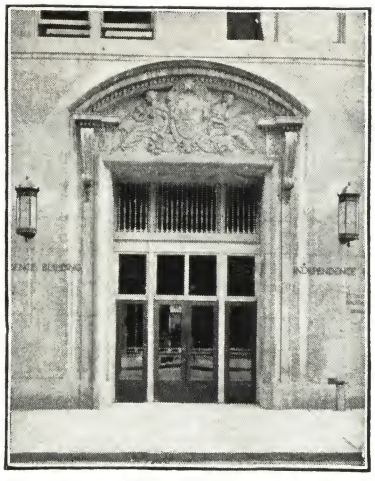
A few of the many large buildings for which we have furnished the ornamental iron work:

BUILDING AND LOCATION	ARCHITECT
Delaware River Bridge, Philadelphia, Pa.	Paul P. Cret
Pennsylvania Railroad Station, Philadelphia, Pa.	Graham, Anderson, Probst & White
Bok Tower, Lake Wales, Fla.	Milton B. Medary
John Hancock Building, Boston, Mass.	Parker, Thomas & Rice
Public Ledger Building, Philadelphia, Pa.	Frank C. Roberts
Fidelity Mutual Life Insurance Building, Philadelphia, Pa.	Zantzinger, Borie & Medary
Second Church of Christ, Scientist, Germantown, Pa.	Day & Klauder
Provident Trust Company, Philadelphia, Pa.	Rankin & Kellogg
State Penitentiary, Rockview, Pa.	John T. Windrim

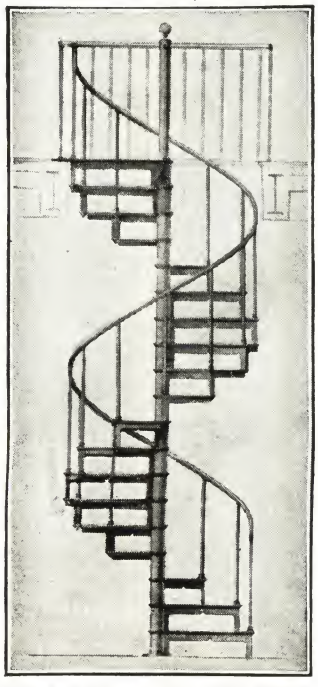
Cast Iron Main Stairs, Bennett Hall, University of Pennsylvania, Philadelphia
STEWARDSON & PAGE, Architects



Wrought Iron Organ Screen, Second Church of Christ, Scientist, Philadelphia, Pa.
DAY & KLAUDER, Architects

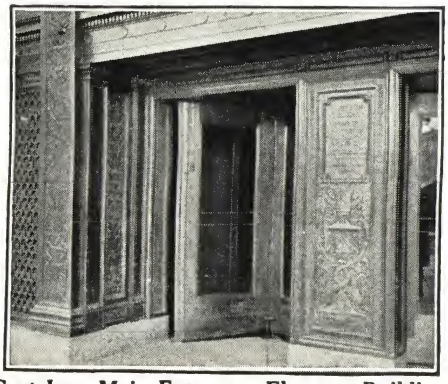


Cast Iron Main Entrance, Independence Indemnity Insurance Co., Philadelphia, Pa.
RITTER & SHAY, Architects



Smyser-Royer No. 300 Stock Spiral Stairs

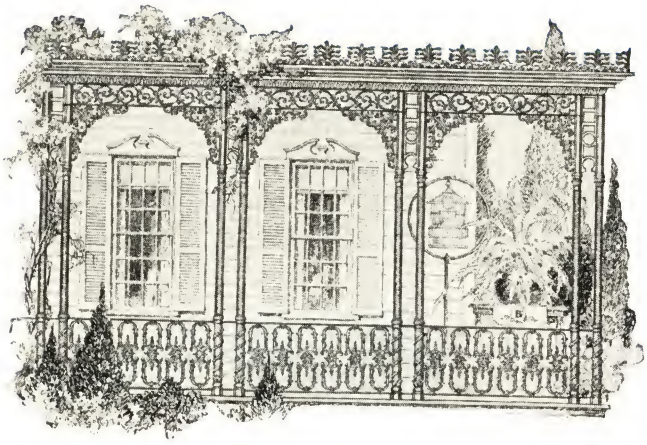
Cast Iron Main Entrance, Elverson Building, Philadelphia, Pa.
RANKIN, KELLOGG & CRANE, Architects



Cast Iron Main Entrance, Elverson Building, Philadelphia, Pa.
RANKIN, KELLOGG & CRANE, Architects

Booklet

A booklet giving complete information, details and descriptions of cast iron verandas will be mailed upon request.



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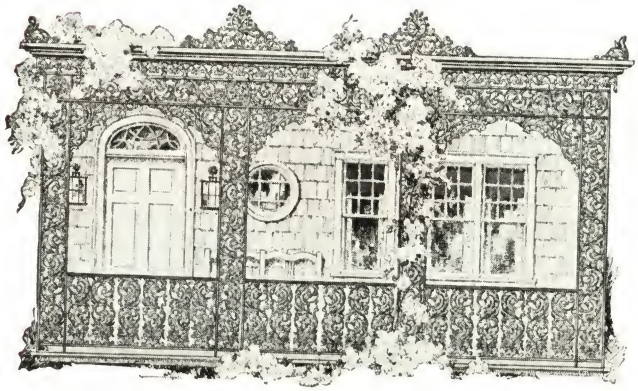
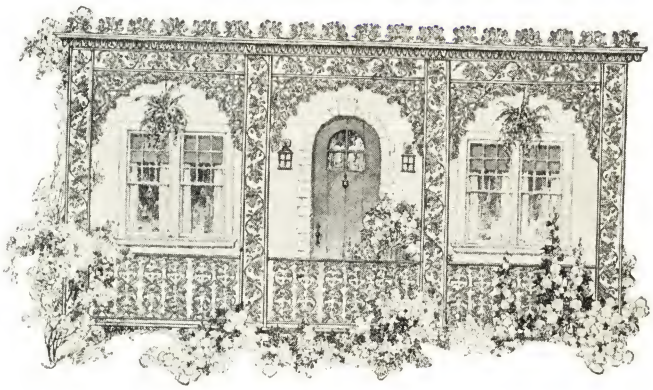
During the 90 years' continuous operation of our works at York, Pa., we have accumulated a great variety of patterns for architectural cast iron work.





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Aurora National Bank, Aurora, Ill.
Matteawan National Bank, Beacon, N. Y.
Federal Trust Company, Newark, N. J.

American State Bank & Trust Co., Pittsburgh, Pa.

Federal Reserve Bank, New Orleans, La.
Standard Savings & Loan Co., Detroit, Mich.
Bound Brook Trust Co., Bound Brook, N. J.
Denver National Bank, Denver, Colo.
Manufacturers & Traders Peoples Trust Co., Buffalo

York Trust Co., York, Pa.
Glen Cove Trust Co., Glen Cove, N. Y.
Bank of Manhattan Trust Co., Kew Gardens, N. Y.
City National Bank & Trust Co., Hackensack, N. Y.
Germantown Trust Co., Germantown, Pa.
Home Savings & Loan Bank, Salem, Ohio
National Savings & Trust Co., Washington, D. C.
Colonial Trust Co., Waterbury, Conn.
Jenkintown Bank & Trust Co., Jenkintown, Pa.
National City Bank, Jackson Ave., Long Island City, N.Y.
Berwyn State Bank, Berwyn, Ill.
Banco de Bogota, Colombia, S. A.
Tenth National Bank, Philadelphia, Pa.
First National Bank, York, Pa.

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Frank R. Jelleff, Washington, D. C.
W. B. Moses & Sons, Washington, D. C.
I. Miller & Sons, 1552 Broadway, New York, N. Y.
Wm. Livingstone Memorial Lighthouse, Belle Isle, Detroit, Mich.
J. H. Cutter Bldg., Charlotte, N. C.
Drake Towers, Chicago, Ill.
Grant Building, Pittsburgh, Pa.
John G. Shedd Aquarium, Chicago, Ill.

Book-Cadillac Hotel, Detroit, Mich.
Library for J. P. Morgan, New York, N. Y.
Rockefeller Medical Research, New York, N. Y.

Angeline Elizabeth Kirby Memorial Health Center, Wilkes-Barre, Pa.
Lehigh Telephone Bldg., Easton, Pa.
Detroit Institute of Arts, Detroit, Mich.

Masonic Temple, Detroit, Mich.
Bosworth-Chanute Bldg., Denver, Colo.
Bonwit-Teller Co., Philadelphia, Pa.
New Orleans Public Service Co., New Orleans, La.
Buncombe County Courthouse, Asheville, N. C.
Travelers Insurance Co., Hartford, Conn.

Agricultural Insurance Bldg., Watertown, N. Y.
Woolworth Bldg., Watertown, N. Y.
David A. Brown Mausoleum, Detroit, Mich.
I. Miller Mausoleum, Union Field Cemetery, Brooklyn
Clinton P. Case Mausoleum, Tarrytown, N. Y.
Graham-Keenan Mausoleum, Wilmington, Del.
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Tyler Elevator Cars are available in Wood, Me-Tyl-Wood, Aluminum, Bronze, Benedict Metal, Monel, Steel, and Stainless Steel.

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Tyler Elevator Entrances are available in Me-Tyl-Wood, Aluminum, Bronze, Benedict Metal, Monel, Steel, and Stainless Steel.

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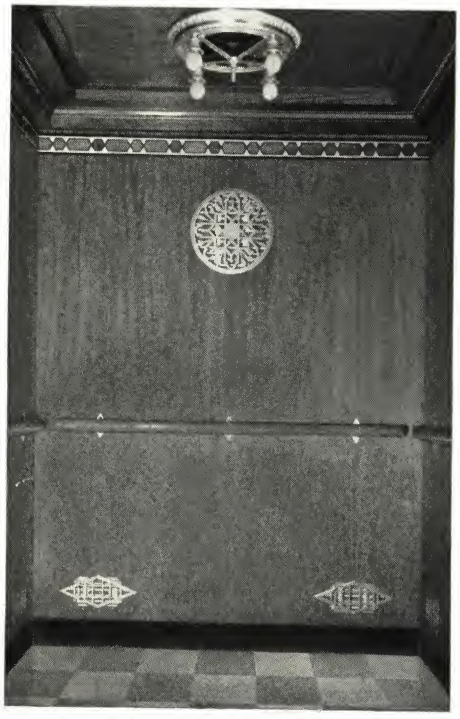

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Tyler Architectural Metal Products include Balcony Railings, Bronze Tablets, Building Entrances, Check Desks, Counter Screens, Grilles, Lamps, Marquises, Mausoleum Doors, Metal Show Cases, Show Window Backs, Spandrels and Stairs.

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PHILADELPHIA, PA.: Drexel Building; Atlantic Building; Convention Hall.

LOS ANGELES, CALIF.: Bullock's Department Store; Public Library.

DETROIT, MICH.: Greater Penobscot Building; Union Trust Building; Fisher Building.

CLEVELAND, OHIO: Terminal Tower Group; Ohio Bell Telephone Building; Union Trust Building.

ST. LOUIS, MO.: Plaza Apartment Hotel.

BOSTON, MASS.: United Shoe Machinery Building.

PITTSBURGH, PA.: Gulf Building.

BUFFALO, N. Y.: New City Hall.

MILWAUKEE, WIS.: Century Building.

NEWARK, N. J.: National Newark & Essex Building.

MINNEAPOLIS, MINN.: Mariner Tower.

KANSAS CITY, MO.: Kansas City Power & Light Building.

COLUMBUS, OHIO: American Insurance Union Building.

PROVIDENCE, R. I.: Industrial Trust Building.

ATLANTIC CITY, N. J.: Haddon Hall.

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Individual Letters	Bas-reliefs	Special Hardware
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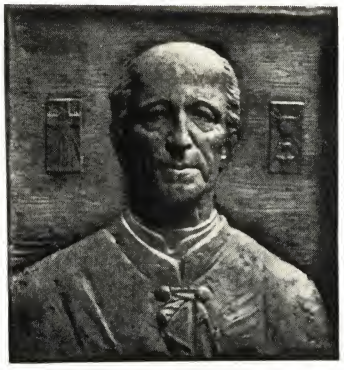
We submit original ideas and special sketches to meet individual requirements.

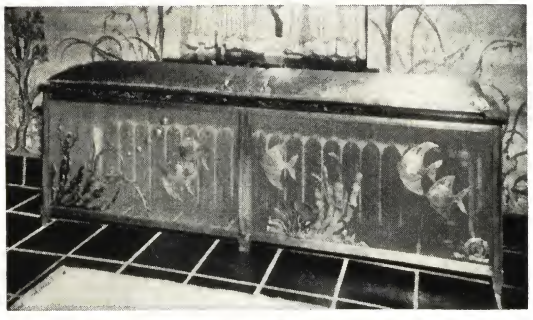
Estimates furnished from architects' plans and specifications.



Left:
Sculptured Bronze Portrait Tablet
RAYMOND. PORTER, Sculptor

4-Foot Chiseled Silvered Bronze Cross
ARMSTRONG, FURST & TILTON, Architects

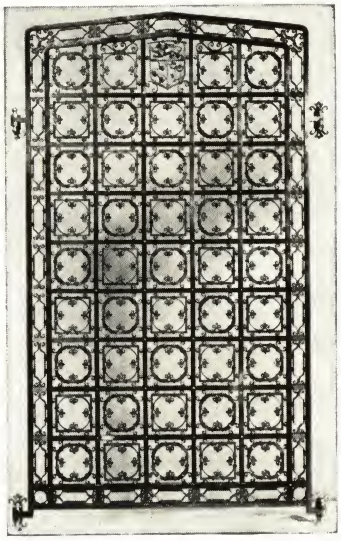
Right:
Hand Forged Bronze Railing
AULER, JENSEN & BROWN, Architects



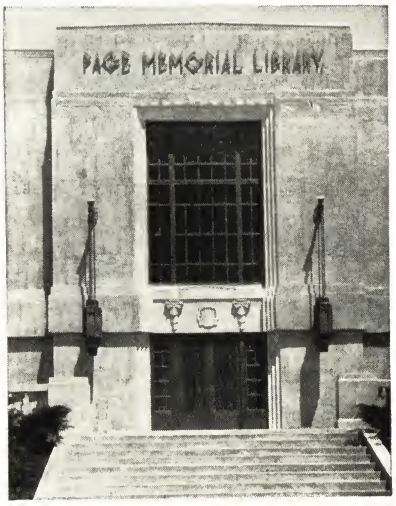
Hand Forged Monel Radiator Enclosure

Modeled Bronze Tablet

Ceramic Inlaid Enamel Bronze Tablet in Ten Colors
GRANGER & BOLENBACHER, Architects



Hand Forged Iron Window Grille



Cast Bronze Front and Entrance
OTIS FLOYD JOHNSON, Architect

WERRA ALUMINUM FOUNDRY CO.

Aluminum Founders for Over Thirty-five Years

WAUKESHA, WIS.

ALUMINUM CASTINGS OF UNSURPASSED QUALITY

Experience, Facilities and Service

The WERRA ALUMINUM FOUNDRY CO., in over thirty-five years of operation, has achieved a reputation for skilled workmanship in executing the unusual in aluminum castings, regardless of size of intricacy of design. A thoroughly modern plant with 110,000 sq. ft. of floor space assures capable handling and speed in delivery to any part of the United States. We are in position to offer helpful service to the architect in the mechanical execution of ideas involving the use of ornamental cast aluminum.

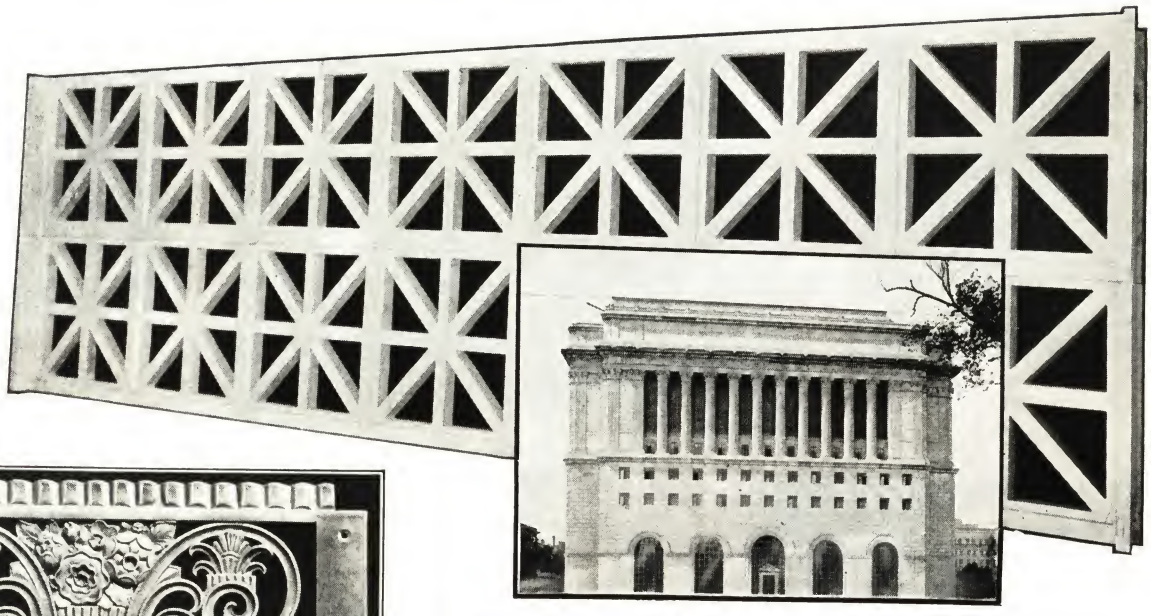
A Few Uses of Cast Aluminum

Cast aluminum has many applications in modern building practice. It is an ideal metal for grille work, spandrels, balustrades and newels, columns, doors, entrances and fascias, lamp standards, lighting fixtures and similar products.

Section of a Cast Aluminum Organ Grille

Advantages of Cast Aluminum

The use of cast aluminum for ornamental and structural design has increased tremendously during the past decade. Because cast aluminum possesses non-corrosive quality, light weight, strength, will not crack or stain adjacent masonry and may be worked into elaborate design, it is particularly suitable for spandrels, grille work, etc. It requires no painting, thus saving a large annual expense and, of equal importance, preserving the detail, beauty and intricacy of design.



(1)

One of Twelve Hundred Hollow Cast Aluminum Grilles Installed in the New Milwaukee County Courthouse

Each of these grilles is 17 ft. 3 in. long and 2 ft. 6 in. wide. They are cast hollow and ingeniously mounted on the masonry behind the tall columns so that adequate provision is made for expansion and contraction of metal. Total surface area of grilles, 26,000 sq. ft.

(2)

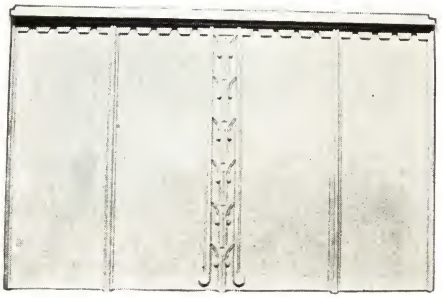
(1) A Small Decorative Grille

(2) Decorative Panel

(3) Section of a Massive Stair Rail
Suggestive of the intricate castings possible with aluminum

(3)

Typical Werra Cast Aluminum Products



Cast Aluminum Spandrel

JNO. WILLIAMS, INC.

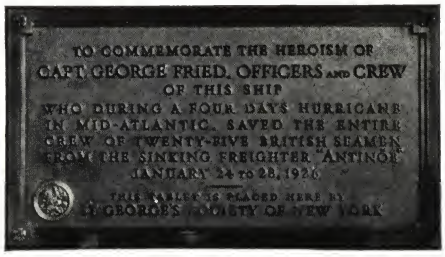
Manufacturers of Bronze, Iron and Wire Work
Bronze Founders

TELEPHONE
CHickering 4-1420

542 West Twenty-seventh Street
NEW YORK, N. Y.

Products

ORNAMENTAL BRONZE, IRON and WIRE WORK, including: Bronze and Iron Entrance Doors; Door and Window Grilles; Stair and Tube Railings; Lamp Standards; Bank Fittings, Screens and Enclosures; Wire Mesh Work; Elevator Enclosures; Mausoleum Doors and Fittings; Memorial Tablets; Honor Roll Tablets; Bronze Signs and Letters; Fine Bronze Castings; Statues, Figures and Portraits; Busts and Medallions; Monumental Bronze Work; Fountains and Sundials; Iron Driveway Gates; Fencing and Grille Work.



Cast Bronze Tablet for S. S. "President Roosevelt"

Cast Bronze Lantern, Apartment House, New York, N. Y.
A. J. THOMAS, Architect

Bronze Sculpture "Aquarius," Bank of Manhattan Building, 40 Wall Street, New York, N. Y.
ELIE NADELMAN, Sculptor

Bronze Clock, The Sun Building, New York, N. Y.
THOMPSON, HOLMES & CONVERSE, INC., Architects

Bronze, Wire and Glass Partition, Main Office, Bank of Manhattan Trust Co., New York, N. Y.
MORRELL SMITH, Architect

Wrought Iron Counter Screen, Customers' Desks and Cage Work in Dime Savings Bank, 86th Street Branch, Brooklyn, N. Y.
HALSEY, MCCORMACK & HELMER, Architects

Bronze Door for Mausoleum, Tuxedo Park, N. Y.
WILLIAM CRAWFORD, Builder

THE AMERICAN BRASS COMPANY

Sole Manufacturers of Everdur Metal—Sheets, Wire, Rods, Tubes

GENERAL OFFICES

WATERBURY, CONN.

For Manufacturing Plants, Offices and Agencies, see our page on Sheet Copper

Products

EVERDUR METAL, an Anaconda alloy, is recommended for use wherever service conditions require a metal combining the strength of steel with high resistance to corrosion. Manufactured in the form of Plates, Sheets, Wire, Rods, Tubes, Rivets, Casting Ingots, Forging Blanks and Special Shapes. Arrangements have been made with leading fabricators to supply Everdur in various forms, such as bolts, nuts, screws, nails, castings, forgings, etc.

For pages on Anaconda Sheet Copper, Brass and Copper Pipe, Architectural Bronze, Copper and Nickel Silver, see Manufacturers' Index.

General Properties

Everdur is an alloy of copper (96%), silicon and manganese which is golden bronze in color. It has the strength of medium carbon steel and is immune to season cracking.

Everdur is non-rusting and offers high resistance to a large number of corroding agents (corrosion-resistance data sent on request).

Everdur can be cast, rolled, drawn, spun, forged, pressed and welded, and is worked either hot or cold. It is unique among high-strength, non-ferrous metals in that it is readily welded by all commonly used methods.

Everdur makes unusually sound castings and possesses excellent machining qualities.

Because of this unique combination of properties, Everdur has been successfully adapted to a wide variety of needs. Some of the uses in modern building construction and equipment to which Everdur has been advantageously applied are discussed on this page.

Tanks and Boilers

Everdur, with its high strength and excellent corrosion resisting properties, is an ideal metal to use for water storage tanks.

Everdur tank plates are supplied by The AMERICAN BRASS COMPANY in plates of any size and thickness up to 4200 pounds in weight for the fabrication of large welded or riveted tanks. Domestic water heating units with welded Everdur Tanks can now be obtained from several manufacturers of nationally advertised products. Everdur Tanks used with brass pipe completely eliminate rust from the water supply.

Smoke and Soot Washers, etc.

Because of its high resistance to corrosion, Everdur is used to advantage for smoke and soot washers. It has also been found extremely practicable for ventilating ducts, floor drains, nuts, bolts, screws, etc., subjected to the corrosive conditions encountered in battery rooms, electroplating establishments, railroad terminal sheds, chemical plants, etc. In the last few years Everdur has been used with marked success for skylight frames and supports under conditions so extreme that less durable materials failed in a short time.

Ventilating Duct of Everdur Sheet Metal

Terra Cotta Anchors, etc.

Due to the high strength and high yield point of wrought Everdur, and to the fact that these properties do not diminish even though the metal is constantly subject to the deteriorating influence of water and moisture, Everdur is being used for terra cotta anchors, window cleaners' safety anchors and bolts, ceiling hangers, etc.

Drop-forged Everdur Window Cleaner's Safety Anchor

Roofing Nails

Everdur is being employed on an increasing scale for nailing slate, heavy tile and other materials of considerable weight. Everdur nails possess the strength of steel nails, as well as immunity to rust and high resistance to corrosion. They can be driven into hard woods or other materials without bending in the shank or flattening at the points.

Castings

Leading brass and bronze foundries are prepared to furnish Everdur in all types of castings. The inherent strength and durability of the metal is retained in the cast form, Everdur castings having considerably more strength than the "tin-bronzes" commonly used in foundry work. In addition, the castings produced are finely grained, tough and homogeneous.

Consultation Service

An Anaconda engineer will be pleased to consult with architects desiring further information on the many applications of Everdur in modern buildings.

THE INTERNATIONAL NICKEL COMPANY, INC.

Monel Metal and Nickel and Allied Products

EXECUTIVE OFFICES

67 Wall Street
NEW YORK, N. Y.

MINES AND SMELTER: Copper Cliff, Ont., Canada
ROLLING MILL AND REFINERY: Huntington, W. Va.
REFINERY: Port Colborne, Ont., Canada
FOUNDRY: Bayonne, N. J.

DISTRIBUTORS
(Warehouse Stocks)

ATLANTA, GA., J. M. Tull Rubber & Supply Co., 285 Marietta Street
BOSTON, MASS., Whitehead Metal Products Co. of New York, Inc., 67 Washington Street, No.
BUFFALO, N. Y., Whitehead Metal Products Co. of New York, Inc., 319 Niagara Street
CHICAGO, ILL., Steel Sales Corporation, 129 So. Jefferson Street
CINCINNATI, OHIO, Williams & Company, Inc., 2118 Spring Grove Avenue
CLEVELAND, OHIO, Williams & Company, Inc., 1748-1756 E. 22nd Street
DENVER, COLO., Hendrie & Bolthoff Mfg. & Supply Co., 1621 17th Street
DETROIT, MICH., Steel Sales Corp., 3-218 General Motors Building
ERIE, PA., Williams & Company, Inc., 1121 Erie Trust Building
KANSAS CITY, MO., Steel Sales Corp., 1115 Grand Avenue
LOS ANGELES, CALIF., Pacific Metals Co., Ltd., 407 E. 3rd Street
MILWAUKEE, WIS., Steel Sales Corp., 490 Broadway
MINNEAPOLIS, MINN., Steel Sales Corp., 535 So. 7th Street
NEWARK, N. J., Whitehead Metal Products Co. of New York, Inc., 215 Frelinghuysen Avenue
NEW ORLEANS, LA., Equitable Equipment Company, Inc., 410 Camp Street
NEW YORK, N. Y., Whitehead Metal Products Co. of New York, Inc., 304 Hudson Street
PHILADELPHIA, PA., Whitehead Metal Products Co. of New York, Inc., 725 Arch Street
PITTSBURGH, PA., Williams & Company, Inc., 901 Pennsylvania Avenue
ST. LOUIS, MO., Steel Sales Corp., 4903 Delmar Boulevard
SAN FRANCISCO, CALIF., Pacific Metals Company, Ltd., 3100 19th Street
SEATTLE, WASH., Eagle Brass Foundry Company, 21 Spokane Street
TOLEDO, OHIO, Williams & Company, Inc., 734 Nicholas Building
MONTREAL, CANADA, Robert W. Bartram, Ltd., 277 Duke Street
TORONTO, CANADA, Peckover's Limited, 77 Front Street, E.
VANCOUVER, B. C., Wilkinson Company, Ltd., 190 Second Avenue, W.
EUROPE, Monel-Weir, Limited, Cathcart, Glasgow, Scotland
AUSTRALIA, Ferrier & Dickinson, Ltd., 26 Clarence Street, Sydney, Australia
NEW ZEALAND, Dickinson's Limited, 245 Princes Street, Dunedin, New Zealand.

Monel Metal

Monel Metal is a registered trade mark applied to a technically-controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled, and marketed solely by International Nickel.

Uses of Monel Metal in Building Construction and Equipment

The silvery beauty of Monel Metal and its unique combination of physical properties are responsible for its use in a wide variety of architectural applications.

In modern hotels and restaurants Monel Metal is extensively used for such food service equipment as cook tables, steam tables, serving counters, dishwashing machines, etc.

In hospitals it is used for food service equipment, surgical equipment and laundry equipment.

In the home it is principally used for pantry and kitchen sinks, kitchen cabinet working tops and kitchen table tops.

Other architectural uses are: elevator doors, grilles, trim, railings, gates, fireplace screens, store fronts, etc.

Properties of Monel Metal

Monel Metal combines in the one metal properties otherwise available only in several different metals:

(1) Has an attractive, silvery color.
(2) Is easy to clean and keep clean.
(3) Will not rust.
(4) Has the strength of mild steel.
(5) Is highly resistant to abrasion.
(6) Has a hard smooth surface.
(7) Is highly resistant to corrosion.
(8) Harmonizes with any color scheme.
(9) Retains strength at high temperatures.

Available Forms

Monel Metal is available in the following mill forms:

Full Finished Sheets		Cold Drawn Rods	
Cold Rolled Sheets		Hot Rolled Flats	
Cold Rolled Strip		Hot Rolled Plates	
Hot Rolled Rods		Forgings	
Castings	Wire Cloth	Tubing	Billets
Wire	Wire Rope	Shot	Ingots

Special Shapes (Angles, Channels, etc.).
Accessories (Bolts, Nuts, Screws, Nails, Tacks, etc.).

Architectural Service

A department is maintained for direct contact with architects and engineers to help in the solving of architectural problems involving the use of metals.

General and Technical Publications

"List B of Monel Metal Literature"—A folder giving all available literature, both technical and non-technical, on Monel Metal.

"Instructions for Working Monel"—Complete working instructions for casting, forging, welding, machining, soldering, spinning, brazing, drawing and punching Monel Metal. They will gladly be sent on request.

Other International Nickel Pages

Besides this page on Monel Metal, THE INTERNATIONAL NICKEL COMPANY, INC., has prepared for the use of the architect, other pages covering the use of Monel Metal in:

Ornamental Metalwork; Hospital Equipment; Built-in Kitchen Cabinets; Refrigerators; Food Service Equipment; Laundry Equipment; Kitchen Sinks.

For the location of these pages, refer to the Manufacturers' Index.

AMERICAN NICKELOID CO.

ESTABLISHED 1898

CHICAGO OFFICE
221 No. La Salle Street
Telephone, Franklin 4272

500 West Street
PERU, ILL.

NEW YORK OFFICE
50 Church Street
Telephone, Cortlandt 7-8233

What Chromaloid Is

Chromaloid is the registered trade name of one of the "Finished Raw Materials" produced by the AMERICAN NICKELOID COMPANY from a technically controlled process developed over a period of 33 years. It consists of a combination of copper, nickel and chromium applied to a pure zinc base. Its surface is pure chromium.

Uses of Chromaloid

Many lines of manufacture make use of Chromaloid, but the most common uses in building construction and equipment are as follows:

Kitchen cabinet and table tops
Shelf and counter covering
Panels and splash backs
Trim and moulding
Range hoods
Reflectors
Decorative work
Mirrors

Qualities of Chromaloid

Beautiful in appearance, Chromaloid resembles burnished platinum. It harmonizes with any color and lends to any room a rich, permanent tone. Chromaloid matches the chromium plated plumbing fixtures and hardware now in use in the most modern homes. Chromaloid is lighter than most metals and cannot rust nor tarnish. It is easily cleaned with ordinary soap and water. Chromaloid is readily workable in the ordinary sheet metal tools. Combined with all these inherent qualities, Chromaloid is a metal that can be used extensively because of its extremely low cost. Being a "finished raw material," it is ready for use when installed, and requires no further polishing or refinishing.

How Furnished

Chromaloid is available in two distinct grades:

Commercial quality for ordinary flat work, and High Grade ductile quality where any amount of forming is necessary.

Chromaloid comes in either a bright mirror finish or in a satin or brush finish. It is obtainable in all gauges from .008 in. up to .070 in., and in any size sheet up to 36x96 ins.

Engineering Consultant

Our Engineering Department will be pleased to work with any architect or builder in planning the proper grade of Chromaloid for the particular purpose intended.

Complete information will also be furnished as to the quickest and best manner of working the metal.

Modern Tempo of Metals

Chromaloid sounds the note of the New Day. The modernistic trend demands new treatments of old subjects, and in the home and in commercial structures, the wise use of beauty and ornamentations in their combination with the practical side is opening up new avenues for designers.

Chromaloid fits in perfectly with this new tempo. Permanent and beautiful, it harmonizes with any color scheme . . . strikes a new note, makes of the commonplace something vivid . . . and yet under it all there is that rugged strength which wins over the practical-minded—and with all of these qualities the metal is available at a price well within the means of the average person.

We invite your inquiries on Chromaloid.

ALLEGHENY STEEL COMPANY

GENERAL OFFICES AND WORKS
BRACKENRIDGE, PA.

BRANCH OFFICES

BUFFALO, N. Y., Iroquois Gas Building
CHICAGO, ILL., Peoples Gas Building
CINCINNATI, OHIO, Chamber of Commerce Building
CLEVELAND, OHIO, Union Trust Building
DETROIT, MICH., General Motors Building
LOS ANGELES, CALIF., Roosevelt Building
MILWAUKEE, WIS., Bankers Building
NEW YORK, N. Y., 301 Fifth Avenue
PHILADELPHIA, PA., Sun Building
ST. LOUIS, MO., Missouri Pacific Building

Product

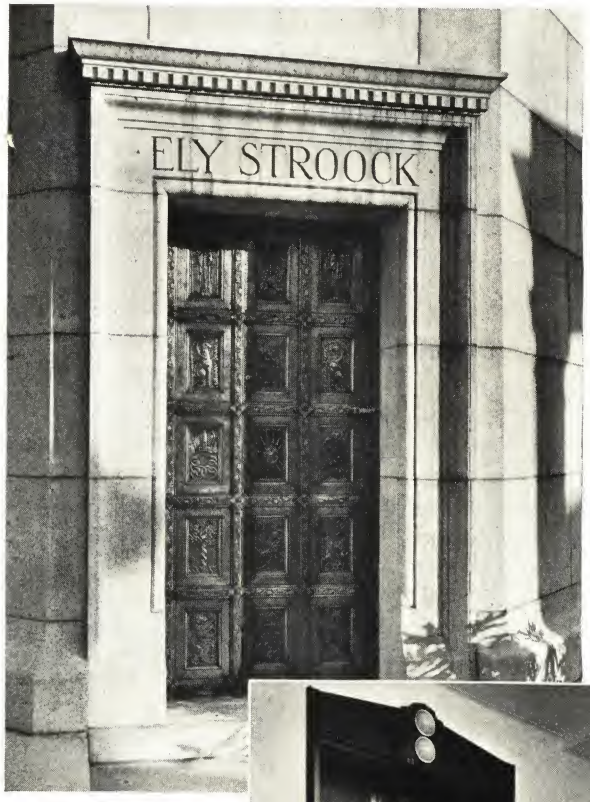
ALLEGHENY METAL.

Building Uses of Allegheny Metal

Allegheny Metal is recommended for building use wherever a bright, silvery surface is needed. Its permanence is assured because it withstands the action of practically every corrosive agent encountered.

Allegheny Metal should not be confused with stainless steels. It is manufactured pursuant to license from the Chemical Foundation, Inc., under basic patent No. 1,316,-817. Because there has been such a great volume of Allegheny Metal produced, the ALLEGHENY STEEL COMPANY is in an enviable position to consult with architects as to its application.

Building lobbies, elevator cabs, grilles, doors, exterior and interior trim, kick plates, mop strip—are but a few of the many architectural uses of Allegheny Metal. The characteristics of the metal recommend it for many more.



Mausoleum Doors
Almost entirely of Allegheny Metal to withstand the ravages of time

Physical Properties

Allegheny Metal is malleable and ductile, permitting a wide range in design. It may be readily annealed, welded and soldered. It may be drawn, spun, stamped, and machined, cast.

This metal has an ultimate tensile strength of 90,000 to 100,000 pounds per square inch as compared with 50,000 to 60,000 pounds for mild steel. Further, it work-hardens rapidly. A moderate amount of cold working will increase the tensile strength to 120,000 to 125,000 pounds, while steel is only slightly changed. The weight of Allegheny Metal is low among corrosion resisting alloys, being .283 pounds per cubic inch.

A commercial polished—or scratch brushed—finish is given Allegheny Metal plates at the mill. It can be polished and buffed to any surface up to the smoothness of a mirror. It is available in all commercial finished forms and in all normal sizes.

Building Applications of Allegheny Metal

The qualities of this alloy have won it a place in many prominent structures.

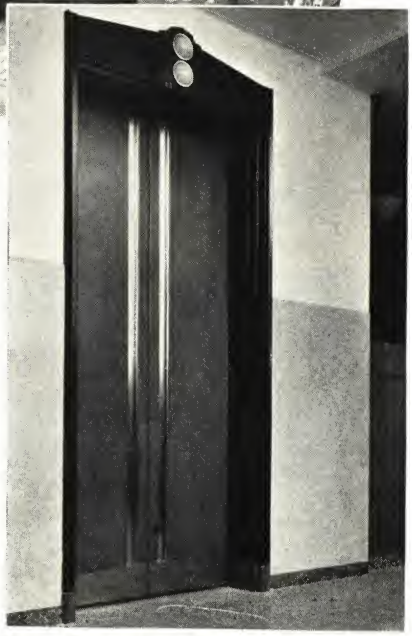
A few are: the Empire State Building, New York, Shreve, Lamb & Harmon, architects; Irving Trust Building, 1 Wall St., New York, Voorhees, Gmelin & Walker, architects; La Salle-Wacker Building, Chicago, Rebori & Wentworth, architects; Mariner Tower, Milwaukee.

Raymond Hood used it in an apartment house loggia in the Metropolitan Museum of Art.

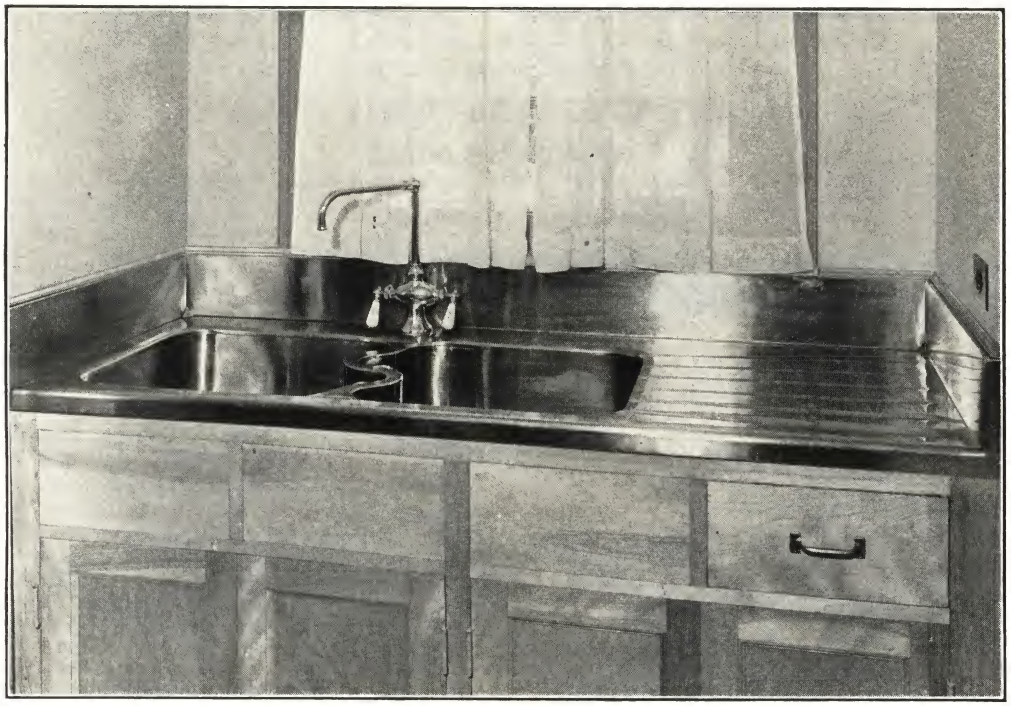
Oscar B. Bach, Craftsman in Metals, has fashioned two mausoleum doors almost entirely of Allegheny Metal.

For decorative use, Allegheny Metal affords an interestingly wide range of finishes. Make it mirror smooth for brilliant bands of white. Use it dull for dignity in restrained design. Etch it with any pattern to harmonize. Alternate Allegheny Metal, brass and copper for still different effects. But never conceal it or paint it over—it is better to use a baser metal instead.

Architects have found that ease of maintenance makes Allegheny Metal valuable. No cleaning fluids or powders are ever needed to keep it bright. Soap and water are used to clean it.



Kick Plates, Mop Strip, and Door Inset, Irving Trust Building, New York, N. Y., of Allegheny Metal



Easy-to-Clean Allegheny Metal Provides an Unrusting, Unstaining, Untarnishing Surface for Sink and Shelves

Other uses of Allegheny Metal bring out its properties and show better why it is so well fitted for building use.

It is widely used in the dairy industry because it withstands the attack of milk products, some of them very acid. In the paper industry it resists the attack of hot sulphite liquors. In hospital work it is used because of its ease of cleaning, and its resistance to various chemicals. In oil refining work it meets sulphur brine at high temperatures and pressures. In photographic work it has been found unusually satisfactory for hypo tanks.

Surely a metal that withstands the attack of so many types of corrosive agents will give excellent service in any type of building work . . . it should replace short-lived metals here as well as throughout industry.

Fabrication of Allegheny Metal

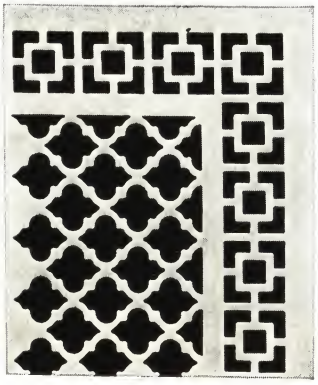
Many fabricators throughout the country have mastered the art of handling Allegheny Metal. As was to be expected, its greater strength and its work-hardening properties made it more difficult to fabricate than ordinary softer metals. The architect can secure lists of experienced fabricators by writing to the ALLEGHENY STEEL COMPANY, at Brackenridge, Pa.

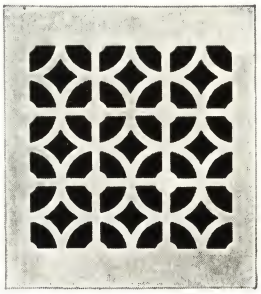
Greater power, more efficient machinery, more skilled workmen are needed to fashion products of this alloy. Completed costs, however, have in almost no cases run higher than those on alloys claiming only a part of the advantages of Allegheny Metal.

The ALLEGHENY STEEL COMPANY has recognized these facts and published a booklet on the fabrication of Allegheny Metal, giving engineering data on shearing, punching, forming and drawing, drilling, machining, sawing, soldering, spinning, annealing, pickling, grinding and polishing, electrolysis and gauge of material. The facts contained in this booklet, "The Fabrication of Allegheny Metal," have all been worked out and tested in the Allegheny Laboratories. These laboratories are willing to consult at any time on new methods or new uses of this alloy—many architects have used their services already.

Warehouse Stocks

Allegheny Metal is easily available. Warehouse stocks are carried in the United States by Jos. T. Ryerson & Son, Inc., at Chicago, Cleveland, Milwaukee, St. Louis, Cincinnati, Detroit, Buffalo, Boston, Jersey City, Philadelphia. In Canada by Samuel, Son & Co., Ltd., Toronto, Ontario.





Grilles and Cast Ornament

Rust cannot mar the beauty of Allegheny Metal grilles or cast ornaments

REPUBLIC STEEL CORPORATION

CENTRAL ALLOY DIVISION

MASSILLON, OHIO

DISTRICT SALES OFFICES

BIRMINGHAM, ALA., Empire Building
BOSTON, MASS., Chamber of Commerce Building
BUFFALO, N. Y., Liberty Bank Building
CHICAGO, ILL., McCormick Building
CINCINNATI, OHIO, Carew Tower
CLEVELAND, OHIO, Union Trust Building
DALLAS, TEX., Republic Bank Building
DENVER, COLO., Continental Oil Building
DETROIT, MICH., Fisher Building
GRAND RAPIDS, MICH., Grand Rapids Press Building
INDIANAPOLIS, IND., Circle Tower
LOS ANGELES, CALIF., Edison Building
MILWAUKEE, WIS., First Wisconsin National Bank Building
NEW YORK, N. Y., Lincoln Building
PHILADELPHIA, PA., Fidelity-Philadelphia Trust Building
PITTSBURGH, PA., Oliver Building
ST. LOUIS, MO., Paul Brown Building
ST. PAUL, MINN., Merchants Bank Building
SAN FRANCISCO, CALIF., Rialto Building
SEATTLE, WASH., Smith Tower Building
TOLEDO, OHIO, Ohio Bank Building
TULSA, OKLA., 405 Thompson Building
YOUNGSTOWN, OHIO, Central Tower Building

Products

ENDURO STAINLESS STEELS in all commercial forms—Billets, Bars, Castings, Forgings, Plates, Pickled and Polished Sheets, Hot Rolled Strip, Cold Drawn Bars, Rough Turned Tube Rounds, Tubing, Wire.

For Steel Pipe and Metal Roofing Sheets, see Manufacturers' Index.

ENDURO
REPUBLIC'S PERFECTED STAINLESS STEEL

Enduro—Republic's Perfected Stainless Steel

An everlasting metal with enduring silvery lustre that brings a new medium for expression in building design.

Enduro is resistant to air, water and most acids at high and low temperatures. It is impervious to the severe attack of atmospheric corrosion. It will not tarnish, corrode, rust or become dull. It is easy to clean—wiping with a damp cloth restores all its original beauty.

Enduro resists corrosion, erosion, abrasion and oxidation. It is strong and ductile, and can be deep drawn, wire drawn, spun, bent, tapped, threaded, flanged, welded, stamped, worked in relief or repoussé. It does not become brittle. It is non-magnetic.

Enduro will not chip, crack or wear thin, for it is the same wonderful metal all the way through. It can be given a mirror-like polish or finished to the feel of soft satin. If desired, it can be etched or treated to produce any of a number of finishes.

Shining Ribbons of Enduro on the Empire-State Building, New York, N. Y.

Enduro is also highly resistant to fruit and vegetable acids, chemical compounds, the acids found in milk and milk products, lemon juice and vinegar. It imparts no foreign or metallic taste, no color and no tendency toward spoilage. It is non-porous, clean, sanitary and free from contaminating tendencies.

Application—Enduro is an ideal material for exterior trim, domes, spires, finials, spandrels, doors, vaults, lighting fixtures, baseboards, grilles, elevator cabs and doors, switch plates, mantels, showcases, hardware and other building applications.

It is also being widely used for restaurant and hotel equipment, hospital equipment, bakery equipment, food producing and handling machinery, dairy and ice cream plant equipment, packing house equipment, chemical and industrial plant equipment, and other applications too numerous to mention.

Enduro Stainless Alloys

To meet the many varied needs for this wonderful new metal, it is produced in a series of alloys, possessing maximum resistance and physical strength, consistent with workability for each field of application.

Literature

A comprehensive series of booklets has been prepared on the Enduro Stainless Alloys containing analysis, physical properties, creep strength, instructions for working and other basic facts concerning the various types of Enduro. Your files will be more complete with this set of booklets. Write for them.

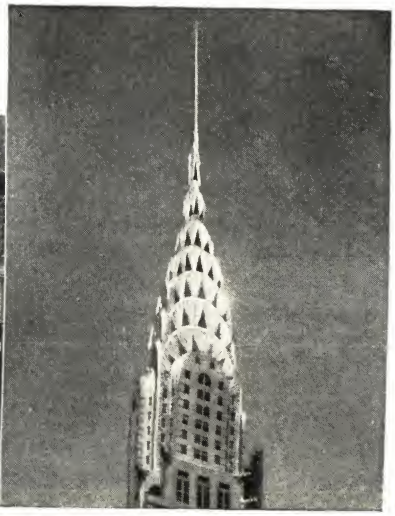
Engineering and Metallurgical Service

The facilities of one of the largest and finest equipped laboratories in America, together with the experience and skill of a trained corps of Republic Metallurgists and Engineers, are at your service in applying Enduro. Tell us your problems.

Enduro—Republic's Perfected Stainless Steel—is licensed under American Stainless, Armstrong, Krupp-Nirosta and the Chemical Foundation patents. . . . Sold only through REPUBLIC *Sales Offices and Authorized Distributers.*

Door Trim Enhanced with the Beauty of Enduro

An Attractive Restaurant Front Done in Enduro



The Scintillating Enduro-clad Dome of the Chrysler Building, New York, N. Y.

METAL AND SPECIAL DOORS ARCHITECTURAL AND INDUSTRIAL TYPES INCLUDING FOLDING, REVOLVING, ROLLING, SLIDING, ETC.

ART METAL CONSTRUCTION COMPANY

Hollow Metal Doors and Trim

JAMESTOWN, N. Y.

For Branch Offices, see Bank, Office and Library Equipment Section

For Art Metal Sectional Metal Office Partitions, Ornamental Bronze Work, Bank, Office, Library and Hospital Equipment, see Manufacturers' Index

ART METAL DOORS AND TRIM IN STEEL AND BRONZE

Detail and Style Plates

In the following pages the aim has been to provide the essential information needed by the architect and builder in making a selection of hollow metal doors and trim to meet any situation.

The large number of styles and types of doors and the wide range of carefully selected mouldings make it possible to provide for any situation in a manner that will be gratifying to architect and owner alike.

Where it is absolutely required, tools and dies will be made for specially designed mouldings—and Art Metal facilities in this direction are most complete. The combinations of Art Metal mouldings with the various styles and types of doors offer such an unlimited field for individual effects, however, that the extra cost for special tools and dies is rarely deemed advisable.

With the plates following and the general description on the next page, it is possible to develop a specification that will be most exact and accurate in meeting the architect's requirements.

Art Metal engineers and representatives are at the service of the architect and builder in amplifying the information on any point.

TRADE-MARK

Types of Doors

The types illustrated in this catalogue cover Art Metal standard construction, with profiles carefully designed and selected to conform to the best in architectural detail.

Art Metal facilities make possible the fabrication of doors in any special type and profile where conditions warrant.

STANDARD FINISHES OF ART METAL DOORS

Class	Finish	Class	Finish
No. 1	Olive "F"	No. 3 (cont.)	White Ivory Cream
No. 2	No. 29 Brewster green No. 30 Stone green No. 51 Medium green No. 52 Brown No. 53 Tan Maroon Black	No. 4	No. 36 Dark mahogany, crotch grain No. 61 Brown mahogany
No. 2½	No. 1 Dull bronze, light No. 2 Dull bronze, medium No. 3 Dull bronze, dark French gray	No. 5	No. 57 Plain oak, medium No. 58 Quartered oak, medium
No. 3	No. 36 Dark mahogany, straight grain No. 36B Light mahogany, straight grain No. 54 Gold bronze No. 55 Silver bronze	No. 6	No. 59 Light American walnut No. 60 Dark American walnut Circassian walnut
		No. 7	No. 56 Verdigris green, stippled No. R-328 Mottled green, stippled

Casings and Mouldings

On plates 5 to 10 inclusive are illustrated some of the many shapes available in Art Metal mouldings. These have been grouped according to principal uses to which they are ordinarily put. However, many of these mouldings are equally suitable for other purposes and while it is hoped that the grouping shown will be of assistance to architects it is not to be considered as the only possible uses for any particular shape. All are made in both bronze and steel. The numbers on the plates are for bronze mouldings; for steel add the suffix ½.

All mouldings are made of specially selected stock and carefully rolled through accurate dies giving a sharp profile. ART METAL CONSTRUCTION COMPANY has unusual facilities for producing special mouldings to architect's designs where standard shapes will not meet requirements.

FIRE UNDERWRITERS' REQUIREMENTS

The National Board of Fire Underwriters has tested and approved Art Metal products, authorizing labels for the following situations:

Class "A," Units in Division Walls Between Separate Buildings or Sections of Buildings—Limitations: swinging type; single doors for openings not exceeding 4x7 feet, and doors in pairs not exceeding 5x7 feet, all steel with approved hardware.

Class "B," Units in Enclosures to Vertical Communications Through Buildings—Limitations: swinging type; single doors for openings not exceeding 4x10 feet, and doors in pairs not exceeding 8x10 feet, all steel with approved hardware.

Class "C," Units in Corridor and Room Partitions—Limitations: swinging type; single doors for openings not exceeding 4x10 feet, and doors in pairs not exceeding 8x10 feet, with or without panels of standard wire glass. Exposed area of individual lights not exceeding 399 square inches.

Class "D," Units in Exterior Walls Subject to Severe Fire Exposure—Limitations: swinging type; single doors for openings not exceeding 4x10 feet, and doors in pairs not exceeding 8x10 feet.

Class "E," Fire Escape Units Subject to Moderate Fire Exposure—Limitations: swinging type; single doors for openings not exceeding 4x10 feet; single doors in pairs not exceeding 5x10 feet. With or without panels of wired glass.

Exposed area of individual lights not to exceed 399 square inches.

Elevator Enclosures "Inspected Fire Door for Passenger Elevator Opening in Vertical Shaft"—Limitations: for single doors, 4x8 feet; for pairs, 8x8 feet.

GENERAL DESCRIPTION FOR SPECIFICATIONS

Materials

Materials used are the best of their respective kinds, and those best suited for their particular purposes. All steel and ingot iron are the best grades commercial furniture stock of the United States standard gauge. All bronze is best grade Richlow stock of Brown & Sharpe gauge, of suitable hardness and uniform color.

Workmanship

All work is executed by craftsmen, in accordance with the latest principles of construction and most modern methods of manufacture.

Doors and Sash

Stiles and rails are formed of No. 18 gauge stock with cold drawn panel mouldings securely keyed thereto and properly reinforced for hardware. Stiles are provided with compressed cork or aircell asbestos insulation for eliminating metallic sound.

Joints are fitted, reinforced, welded and dressed to produce invisible connections.

Metal panels consist of two plates of No. 20 gauge stock, separated by ¼-in. heat retarding insulation.

Glass panels are retained by removable cold drawn moulding frames closely fitted and secured to panel mouldings by No. 6-32 countersunk oval-head screws.

Muntins are constructed of cold drawn interlocking shapes fitted and welded to panel moldings.

Astragals are of cold drawn interlocking shapes welded to door stiles.

Jambs

For openings in walls up to 7½ in. thick, jambs are formed of No. 18 gauge stock; over 7½ in. No. 16 gauge with ⅝-in. plain or moulded stops for regular units, and ¾-in. for underwriters' Class "A" units and secured to bucks by Parker screws.

Casings

Of No. 18 gauge cold drawn shapes, corners accurately mitered, welded and dressed to produce invisible joints. Casings are secured to bucks and jambs by concealed fastenings.

Pressed Steel Bucks

Of No. 14 gauge stock provided with anchor retainers and plaster bonds; corners reinforced with No. 12 gauge splices electrowelded; wood spreaders; No. 18 gauge corrugated adjustable anchors furnished for each 25 in. of opening height.

Bucks for openings more than 3 ft. 6 in. wide in tile or brick walls are provided with No. 12 gauge x 4 in. arched masonry supports welded to heads at ends.

Frames

Combination buck and jamb frames are formed of No. 10, 12, 14 or 16 gauge, corners accurately fitted, welded and dressed to produce invisible rigid joints. Trim members can be pressed into frames or be of drawn shapes applied by concealed fastenings. Frames are provided with spreaders, anchors and masonry supports as specified for bucks.

Hardware

Hollow metal work is prepared and reinforced for proper reception of all hardware and appliances. Ordinarily the hardware is furnished under separate contract, but applied at our plant.

Transom Sash

Stiles and rails are formed of No. 18 gauge stock with cold drawn panel mouldings securely keyed thereto. Glass panels are retained by removable cold drawn moulding frames closely fitted and secured to panel mouldings by No. 6-32 countersunk oval head screws. Muntins are constructed of cold drawn interlocking shapes fitted and welded to panel mouldings.

Transom Bars

Transom bars are formed of No. 10, 12, 14, 16 or 18 gauge stock with plain, paneled or moulded faces and welded to jambs or secured by concealed screws as conditions warrant.

Mullions

Mullions are formed of No. 10, 12, 14, 16 or 18 gauge stock, with plain, paneled or moulded faces and welded to jambs or secured by concealed screws as conditions warrant.

Partition Lights

Partition lights, side lights or borrowed lights are made up similar to door frames under headings "Jambs" and "Frames" described above.

Trim Mouldings

Chair rail, staff or scribe, picture and wire mouldings are of No. 18 or 20 gauge cold drawn shapes, secured to walls by concealed fastenings.

Bases

Constructed of No. 18 gauge with plain or moulded profiles, fitted with bronze sanitary coves and secured to walls by concealed fastenings.

Window Trim

Jamb linings are of No. 18 gauge, plain or paneled, provided with adjustable stops secured by No. 6-32 countersunk oval head screws. Mullions are No. 18 gauge with plain, moulded or paneled faces, and provided with adjustable stops secured by No. 6-32 screws.

Stools are of No. 16 gauge with returns accurately mitered, dressed smooth and secured by concealed method.

Casings and aprons are of No. 18 gauge cold drawn shapes with corners and returns mitered, welded, dressed smooth and secured by concealed method.

Partitions

Of sectional type with units of size allowing for flexibility of arrangement. Units properly constructed of formed and drawn shapes of No. 18 gauge stock, reinforced and so assembled as to produce invisible connections. Owing to its perfected construction, installation is simple and can be performed economically and expeditiously. Ceiling height partitions are secured by indirect method, causing no injury to ceiling.

Bronze Work

The foregoing description covers our standard products in steel. Bronze work is executed similarly except that materials are two gauges heavier, joints are made by riveting, screwing and brazing, and finish is produced in accordance with standard methods for durability and desired effects.

Finish—Baked Enamel

Material is thoroughly cleaned, primed and filled, followed by subsequent coats as required to produce a durable finish of color required. Each coat is uniformly applied, baked, and sanded with final coat rubbed to an eggshell gloss. Prime finish consists of ground-coat filler and dipped or sprayed finish coat.

Elevator Door Hardware

The general practice is to include the hangers for elevator doors in the door contract, the operating device and safety locks being installed under separate contract or with the elevator mechanism and car.

Hangers

Unless specifications state make required, we will use our best judgment in supplying hangers of dependable and recognized manufacture.

NUMERICAL INDEX OF MOULDINGS

Moulding	Plate	Moulding	Plate	Moulding	Plate	Moulding	Plate	Moulding	Plate	Moulding	Plate	Moulding	Plate	Moulding	Plate
01	9	013272	8, 10	013321	8, 9	013409	7	013459	7	013862	10	02241	10	030675	8
0100	8, 10	013273	6	013322	8	013410	6	013460	8	013915	10	023	5	030676	10
0101	8	013274	6	013323	9	013411	7	013461	9	013916	9	024	5	030683	5
0102	9	013275	8	013324	10	013412	7, 8	013462	9, 10	013926	9	02402	9	030585	7
0108	5	013277	10	013325	9	013413	7	013463	10	013950	10	02403	7	030686	10
011	9	013278	10	013326	8, 9	013414	7	013464	9	013951	10	02404	8	030690	9
0111	10	013281	9	013327	10	013415	6	013465	7	013953	5	02405	6	030699	6
0114	8, 10	013282	9	013328	9	013416	7	013466	9, 10	013954	5	02407	8	030700	6
0115	7, 10	013287	8, 10	013329	9	013417	7, 8	013467	9	013955	5	02408	7	030711	5
0116	7	013288	8, 10	013330	10	013419	5	013468	9	013957	10	02410	6	030744	5
0117	8, 9	013289	9	013331	9	013420	6	013504	9	013960	10	02413	9	035	8, 9
0118	7	013290	9	013332	9	013421	5	013508	10	013964	6	02427	10	044	9
0119	8	013291	10	013333	9	013422	5	013512	10	013975	10	02431	10	05	9
0120	10	013292	10	013334	9	013424	5	013517	8, 10	013976	7, 10	02433	8, 10	052	10
0125	9	013293	8, 9	013345	8, 9	013425	5	013518	8, 9	013977	7	02439	10	053	7, 9
0126	9	013294	9	013346	8	013428	5	013524	9	013978	8	02441	10	05481	10
0127	7	013295	9	013349	9	013429	5	013526	8	013985	5	02442	10	059	9
0128	9	013296	8, 10	013350	9	013430	6	013528	9	013997	8, 10	027	10	06	9, 10
0129	8	013298	10	013351	9	013431	6	013531	9	013999	5	030	9	06045	9
0130	7	013299	10	013352	9	013432	8	013535	9	0141	6	030102	5	06123	9
0131	10	013300	9	013353	9	013433	5	013539	8	0146	8	030109	9	06124	8
013143	10	013301	8, 9	013354	9	013434	8	013542	8	0157	8, 9	030121	10	06148	7
013170	6	013302	8	013359	8	013435	6	013546	9	0158	8, 10	030122	8	06165	8
013173	10	013303	8, 9	013360	8	013436	5	013548	9	0159	10	030287	10	06166	8
013190	10	013304	8, 9	013361	9	013437	6	013552	9	0161	10	030293	10	06203	8
0132	9	013305	9	013362	8, 10	013438	6	013553	5	0162	7	030295	5	06204	9
013258	7, 8	013306	9	013363	10	013439	6	013554	6	0167	6	030296	5	066	9
013259	7	013307	9	013364	10	013440	6	013555	5	0170	10	030297	8	070	10
013260	6	013309	10	013368	8	013441	5	013556	6	0171	9	030315	9	072	8, 9
013261	7	013310	9	013372	10	013442	6	013557	5	0172	7	030324	8	074	9
013262	6	013311	10	013375	9	013443	6	013558	6	0173	7	030341	6	076	6, 10
013263	7, 8	013312	9	013376	9	013448	6	013559	8	0177	10	030348	8	077	6, 7, 10
013264	8	013313	9	013386	10	013449	5	013567	9	0178	10	030383	9	079	9
013265	5	013314	9	013390	8	013450	5	013572	10	0181	9	030528	6	084	9
013266	5	013315	8, 9	013391	9	013451	6	013578	10	0183	10	030568	5	085	9
013267	5	013316	8	013393	10	013455	9	013579	9	019	8,9	030574	10	086	7
013268	5	013317	9	013398	9	013456	9	013582	10	0192	10	030579	10	097	9
013269	8, 9	013318	9	013402	9	013457	7	013585	10	0194	6	030580	5	09756	9
013270	8, 10	013319	8	013403	8	013458	8,10	013820	10	02	9	030657	9	09868	7, 10
013271	8	013320	8	013404	8										

SOME ART METAL INSTALLATIONS OF HOLLOW METAL DOORS AND TRIM

CITY	INSTALLATION	ARCHITECT
	CONNECTICUT	
Hartford	Hartford National Bank & Trust Co.	
Torrington	Charlotte-Hungerford Hospital	Crow, Lewis & Wick
Waterbury	Southern New England Telephone Co.	Douglas Orr
	DISTRICT OF COLUMBIA	
Washington	Congressional Library	
Washington	Gallinger Hospital	A. L. Harris
Washington	National Geographic Society	A. B. Heaton
Washington	Tivoli Theatre	Thos. W. Lamb, Inc.
Washington	Washington Loan & Trust Co.	Arthur B. Heaton
	GEORGIA	
Atlanta	City Hall	C. Lloyd Preacher & Co.
Atlanta	First National Bank	Pringle & Smith
	ILLINOIS	
Chicago	Board of Trade Building	Holabird & Root
Chicago	Commonwealth Edison Co.	Holabird & Roche
Chicago	Morrison Hotel	
Chicago	Underwriters' Laboratories, Inc.	Richard E. Schmidt, Garden & Martin
Chicago	Wacker-LaSalle Building	Holabird & Root
	INDIANA	
Anderson	Anderson Bank & Trust Building	
Fort Wayne	St. Joseph's Hospital	Vonnegut, Bohn & Mueller Pohlmeyer & Pohlmeyer
Hammond	First National Bank Building	Weary & Alford
Indianapolis	Selig Building	Vonnegut, Bohn & Mueller
Kokomo	Kokomo Telephone Exchange Building	
Muncie	Ball Memorial Hospital	Kibele & Garrard
	MARYLAND	
Baltimore	Johns Hopkins Medical & Surgical Clinics	Joseph Evans Sperry
Baltimore	Lord Baltimore Hotel	W. D. Stoddart
Baltimore	Hecht Brothers Store	
Baltimore	Municipal Building	W. H. Emory
	MASSACHUSETTS	
Boston	Boston City Hospital	Ritchie, Parson & Taylor
Boston	Commonwealth Atlantic National Bank	Thomas M. James Co.
Boston	Consolidated Gas Co.	Parker, Thomas & Rice
Boston	Edison Electric Illuminating Co.	Bigelow & Wadsworth
Boston	First National Bank Building	York & Sawyer
Boston	John Hancock Mutual Life Insurance Co.	Parker, Thomas & Rice
Springfield	Massachusetts Mutual Life Ins. Co.	Kirkman & Parlett
Springfield	State Building	Burton E. Geckler
Worcester	State Mutual Life Association	Parker, Thomas & Rice

CITY	INSTALLATION	ARCHITECT
	MICHIGAN	
Ann Arbor	University of Michigan	York & Sawyer
Detroit	David Stott Building	Donaldson & Meirer
Detroit	Detroit News	
Detroit	Detroit R. R. Harbor Terminal	Albert Kahn, Inc.
Detroit	Detroit Towers Building	Walter A. Ahlschlager
Detroit	Herman-Kiefer Hospital	Albert Kahn, Inc.
Grand Rapids	Michigan Bell Telephone Co.	Smith, Hinchman & Grylls
	NEW JERSEY	
Atlantic City	Atlantic City Electric Co.	V. B. Smith
Camden	Camden County Courthouse and Municipal Bldg.	Edwards & Green
Hackensack	Holman Building	Moores & Dunford
Jersey City	Holland Tunnel Buildings	Ole Singstedt
Newark	Essex County Hall of Records	Guilbert & Betelle
	NEW YORK	
Albany	Capitol Building	State Division of Architecture
Albany	Department of Health Building	Sullivan W. Jones, State Architect
Albany	Executive Mansion	State Division of Architecture
Brooklyn	Kings County Hospital	Leroy P. Ward
Buffalo	Erie County Courthouse	J. J. Cook
Buffalo	Federal Reserve Bank	Esenwein & Johnson
New York	Equitable Trust Co.	Trowbridge & Livingston
New York	Federal Reserve Bank	York & Sawyer
New York	R. H. Macy & Co.	Robert D. Kohn
New York	New Madison Square Garden	Thos. W. Lamb, Inc.
New York	New York County Courthouse	Guy Lowell
New York	No. 2 Park Avenue Building	Buchman & Kahn
New York	Plaza Hotel	Schultz & Weaver
New York	Saks Co. Building	Starrett & Van Vleck
New York	Waldorf-Astoria Hotel	Schultz & Weaver
	OHIO	
Cincinnati	Carew Tower	Walter W. Ahlschlager
Cincinnati	Union Central Life Building	Garber & Woodward
Cleveland	Cleveland Club	Meade & Hamilton
Cleveland	Federal Reserve Bank	Walker & Weeks
Cleveland	National Town & Country Club	George P. Post & Sons
	PENNSYLVANIA	
Harrisburg	Union Trust Co.	
New Kensington	Aluminum Co. of America, Research Bldg.	P. R. L. Hogner
Philadelphia	Equitable Building	A. F. Gilbert
Philadelphia	Free Library of Philadelphia	Horace Trumbauer
Philadelphia	Presbyterian Hospital	John T. Windrum
Pittsburgh	Arrott Land Building	Hunting, Davis & Dunnells
Pittsburgh	McCreery & Co.	
	CANADA	
Edmonton	Canadian Bank of Commerce	York & Sawyer
Montreal	Royal Bank of Canada	York & Sawyer

NOT TO SCALE

· STYLES OF · DOORS ·

PLATE 1

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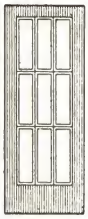
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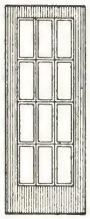
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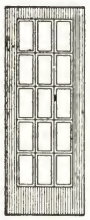
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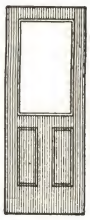
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·A17A·

·A18·

·A19·

·A20·

·A21·

·A21A·

·A22·

·A31·

·A31A·

·A32·

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·A35B·

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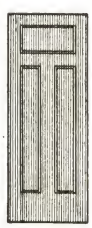
·A36·

·A36A·

·A23·

·A24·

·A25·

·A26·

·A26A·

·A26B·

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·A27A·

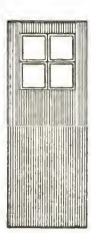
·A28·

·A28A·

·A29·

·A30·

·A30A·

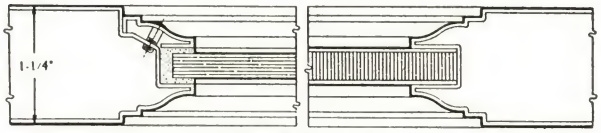

·A30B·

·A30C·

SCALE 6"-1'

· TYPES OF · DOORS ·

PLATE 2



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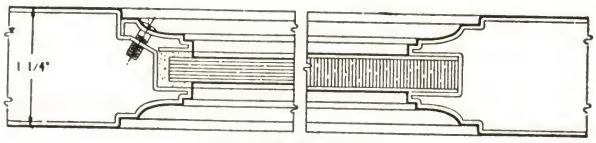

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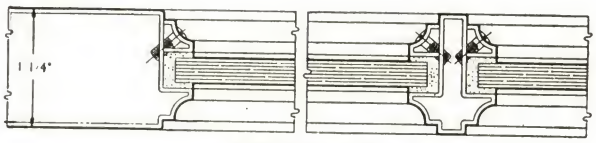
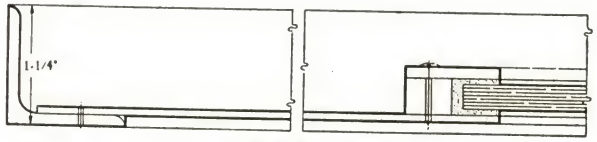
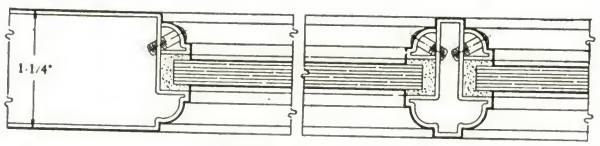


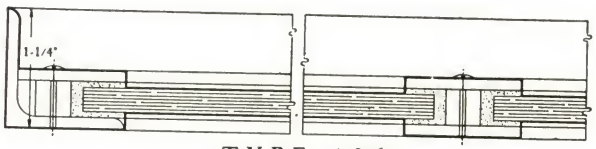
· TYPE · 59 ·



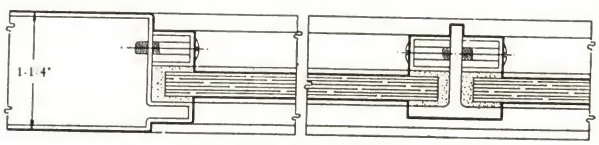
· TYPE · 100 ·



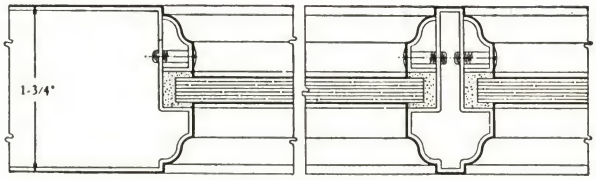
· TYPE · 61 ·



· TYPE · 106 ·

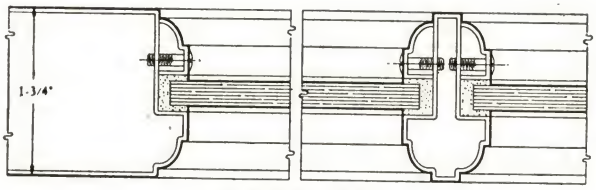


· TYPE · 102 ·

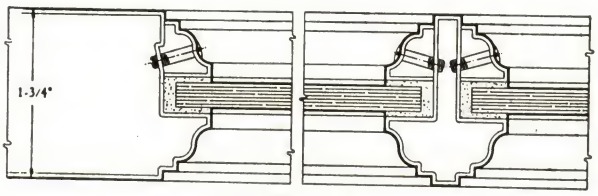


· TYPE · 50 ·

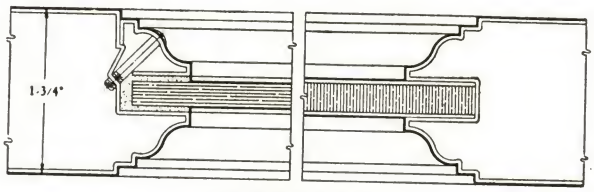
· TYPE · 56 ·



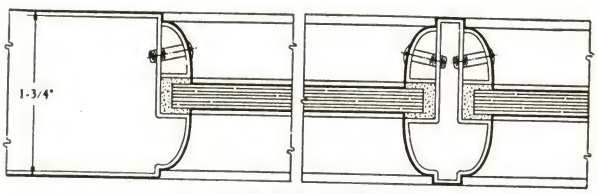
· TYPE · 54 ·



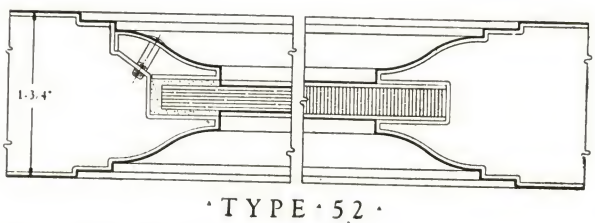
· TYPE · 95 ·



· TYPE · 51 ·



· TYPE · 89 ·

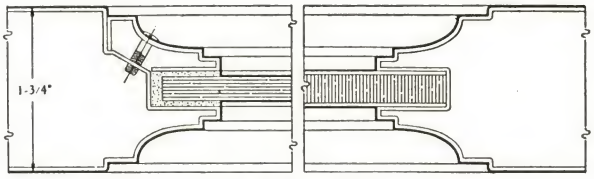


· TYPE · 52 ·

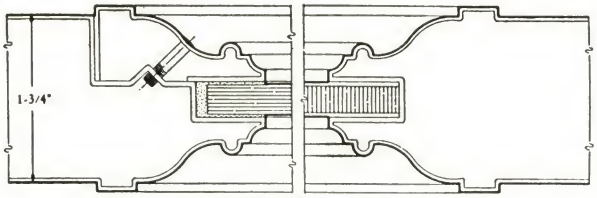
SCALE 6"=1'

TYPES OF DOORS

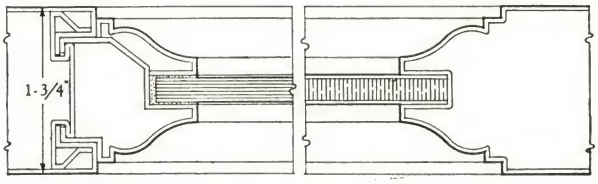
PLATE 3



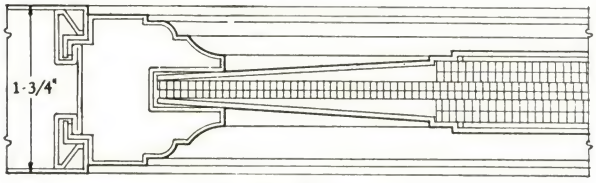
·TYPE·57·



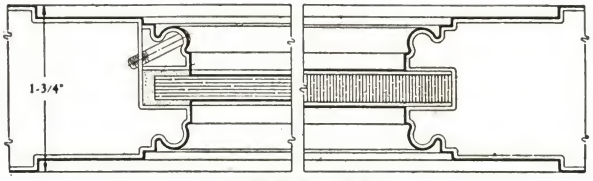
·TYPE·63·
CANNOT BE LABELED



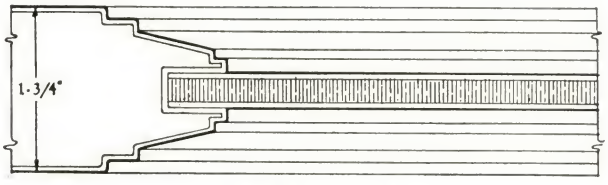
·TYPE·108·



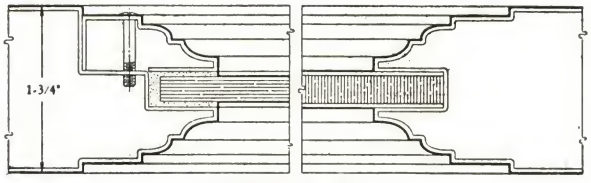
·TYPE·90·



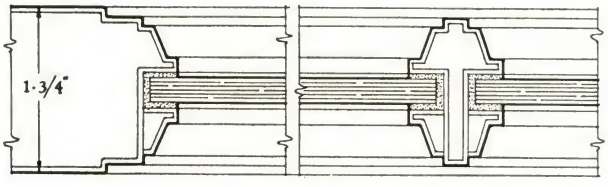
·TYPE·55·



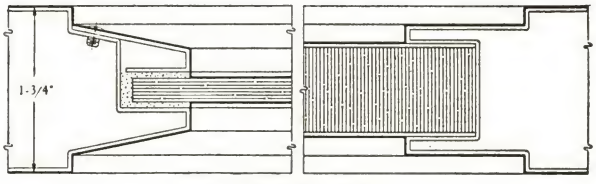
·TYPE·107·
WITH STEEL PANELS



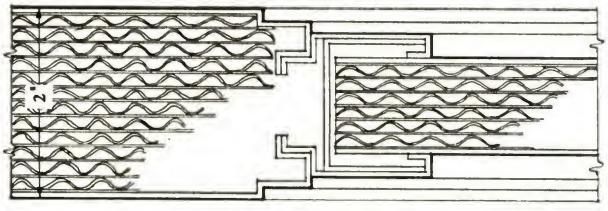
·TYPE·90·



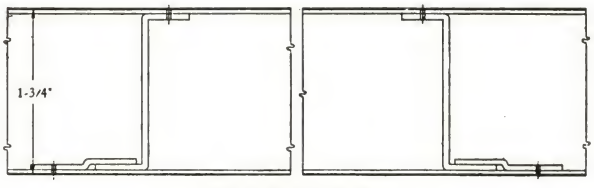
·TYPE·107·
WITH GLASS PANELS



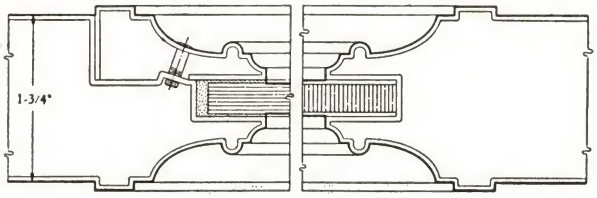
·TYPE·87·



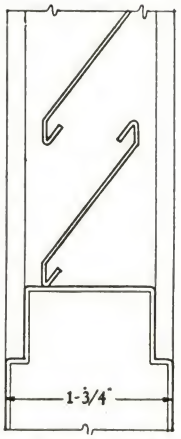
·TYPE·87·
LABELED DOOR



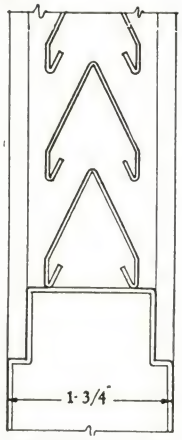
·TYPE·94·



·TYPE·66·



·TYPE·98·

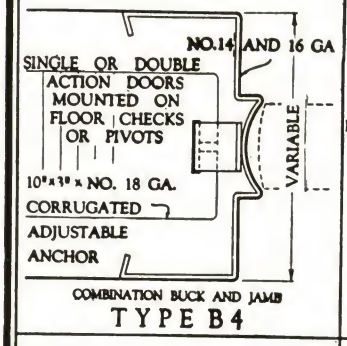


·TYPE·104·

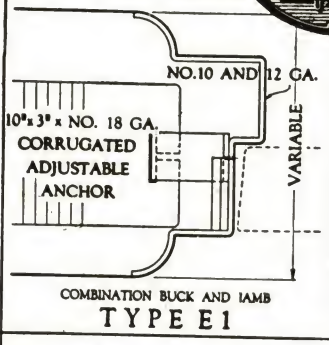
SCALE 3"=1'

DOOR FRAMES

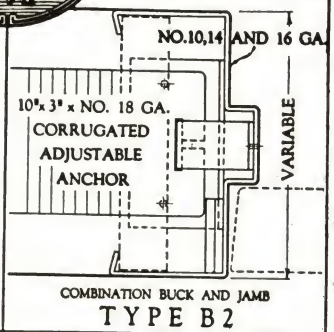
PLATE 4



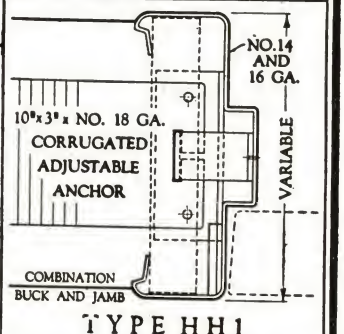
TYPE B4



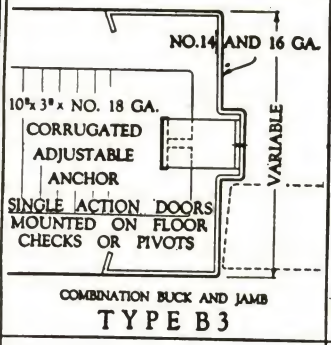
TYPE E1



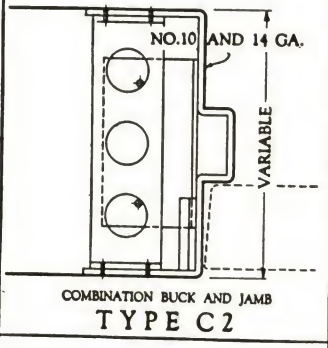
TYPE B2



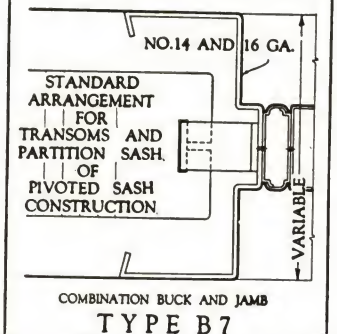
TYPE HH1



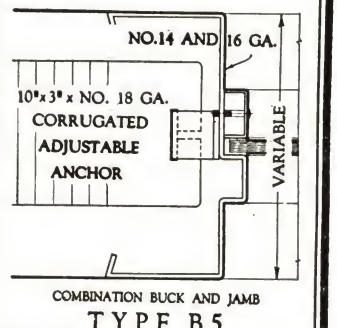
TYPE B3



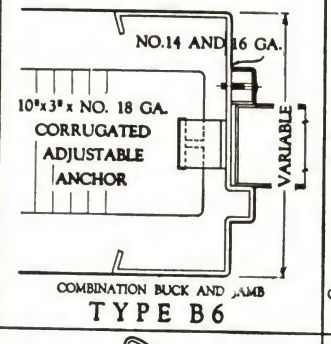
TYPE C2



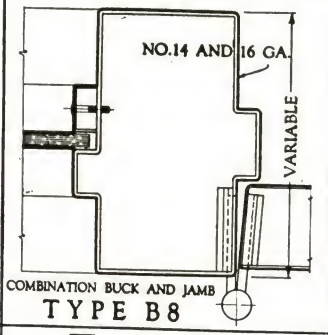
TYPE B7



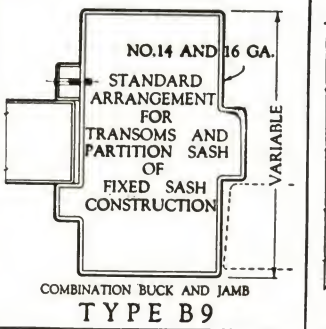
TYPE B5



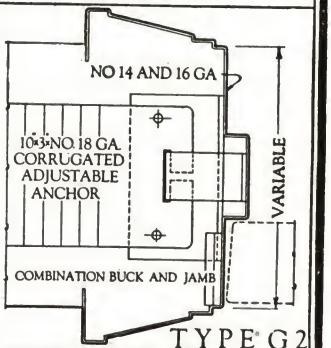
TYPE B6



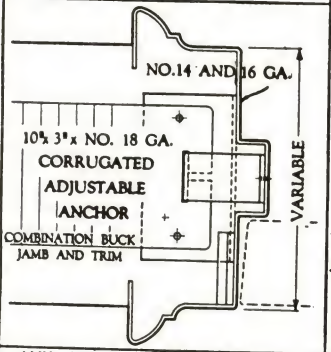
TYPE B8

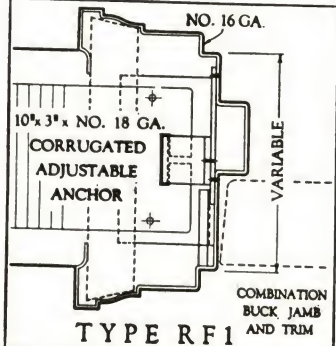


TYPE B9

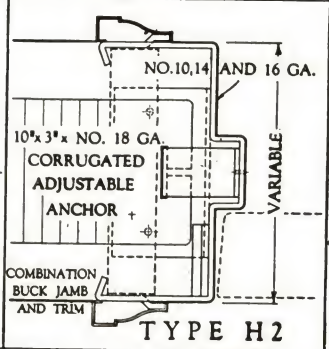


TYPE G2

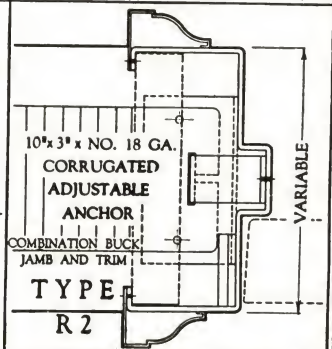




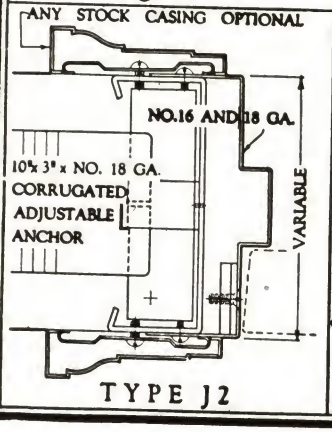
TYPE RF1



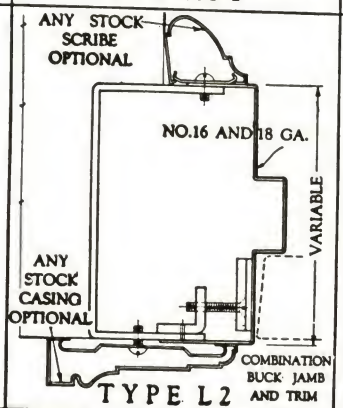
TYPE H2



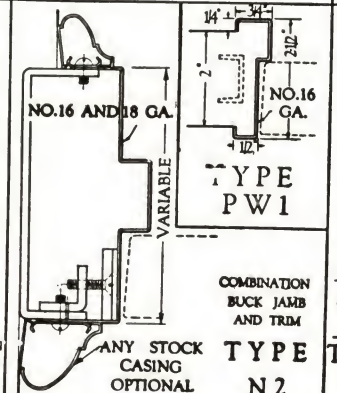
TYPE R2



TYPE J2



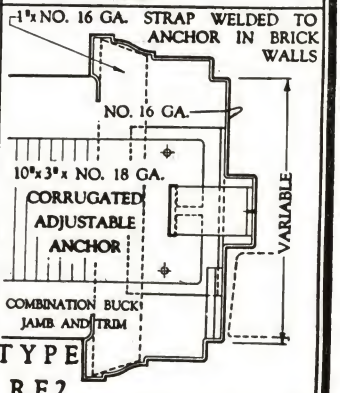
TYPE L2



TYPE N2

TYPE PW1

COMBINATION BUCK JAMB AND TRIM



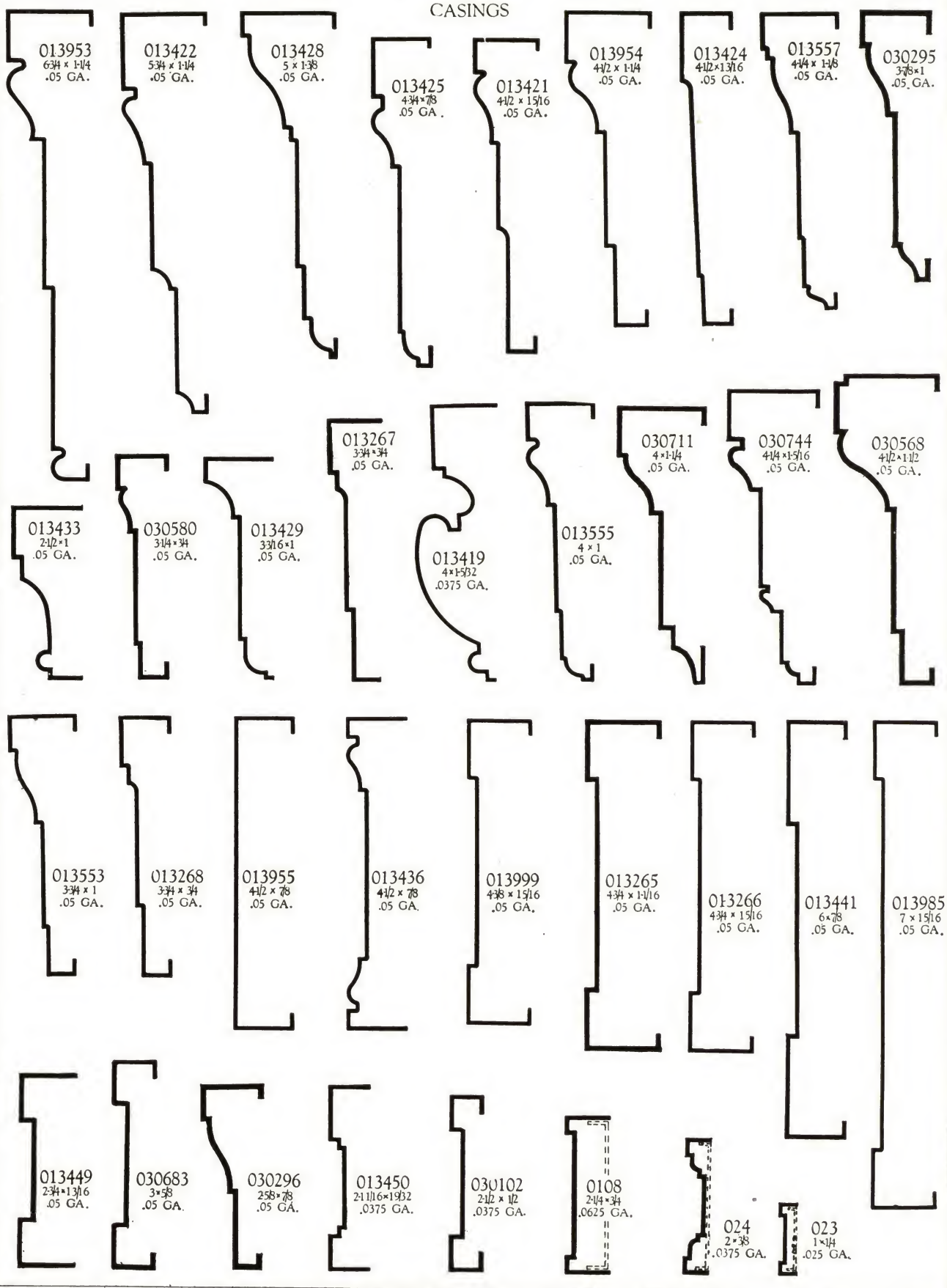
TYPE RF2

SCALE 1/2 F. S.

ART METAL MOULDINGS

PLATE 5

CASINGS



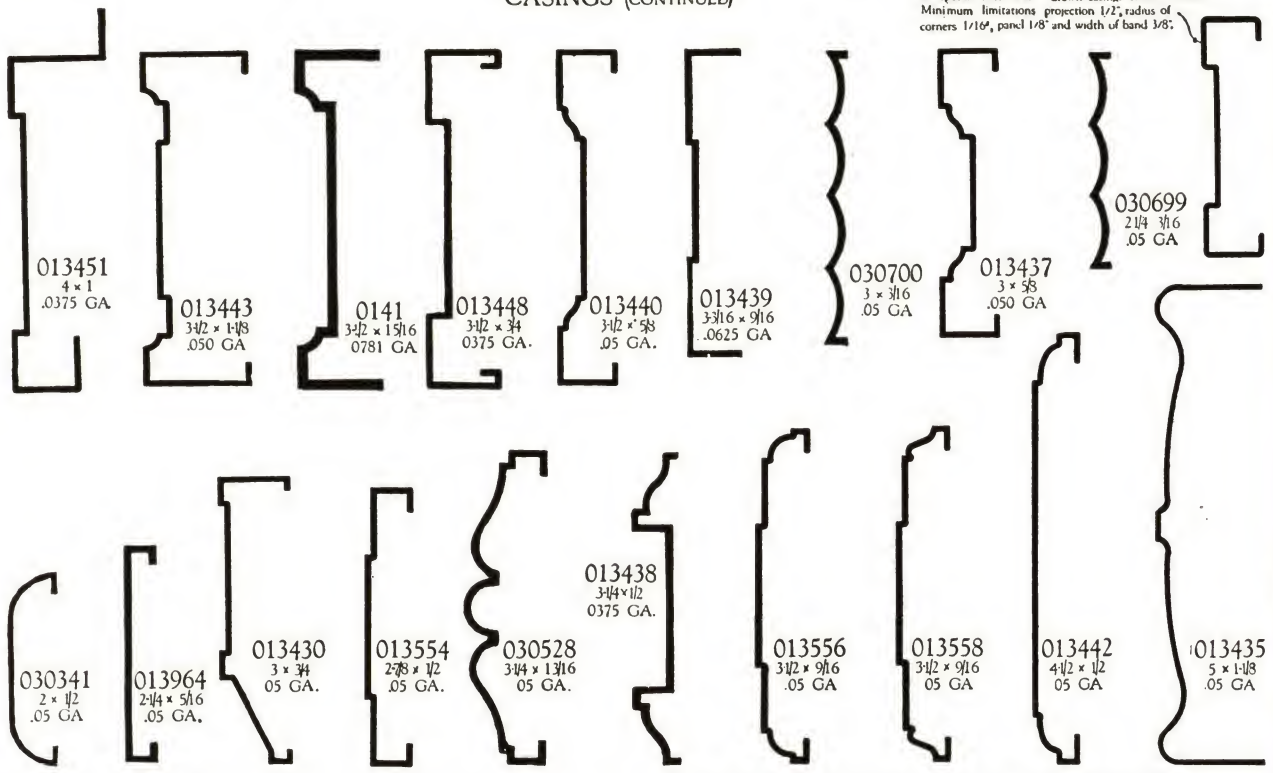
SCALE 1/2 F.S

ART METAL MOULDINGS

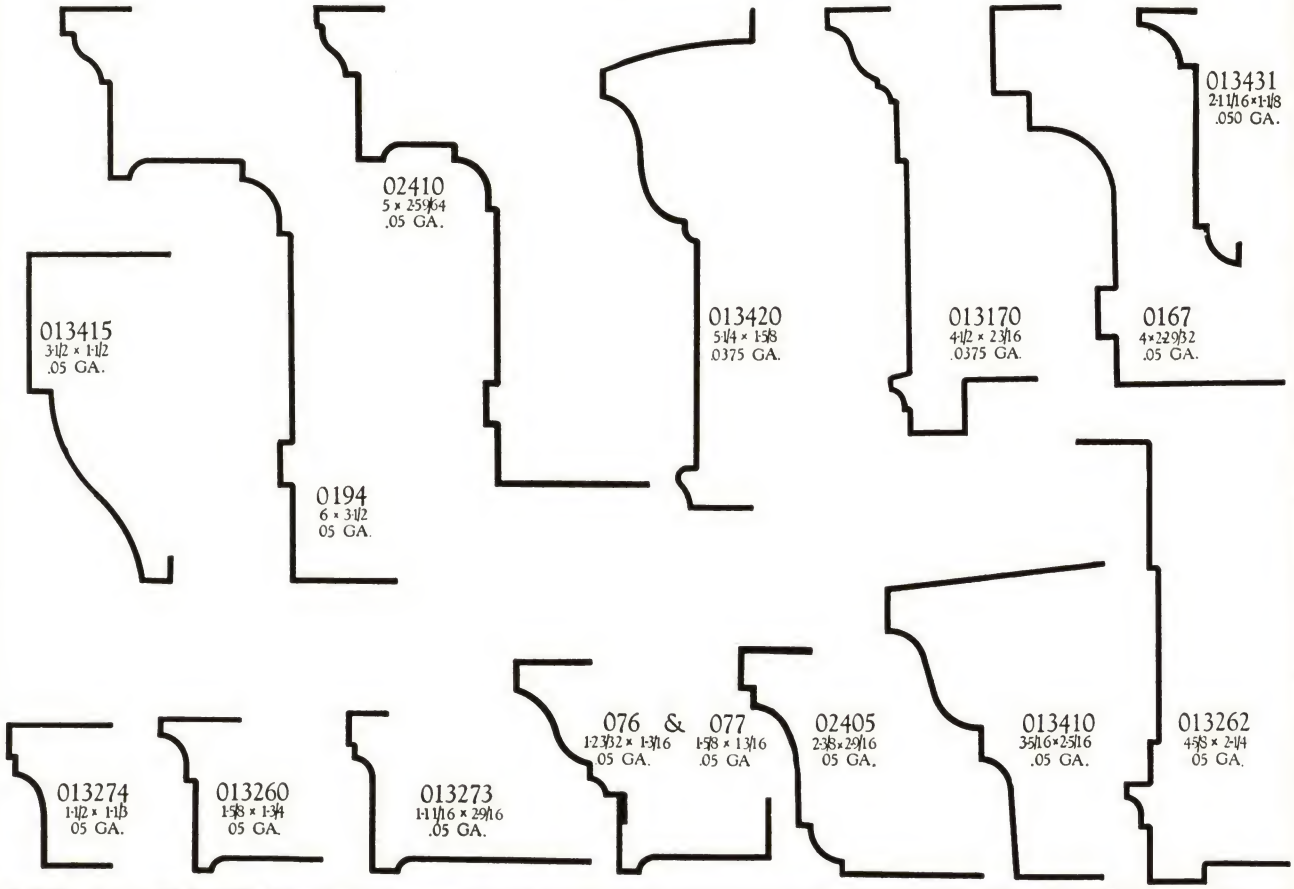
PLATE 6

CASINGS (CONTINUED)

SPECIAL
Casings of this character and with plain faces can be bent up with either square or round corners to special sizes when drawn casings cannot be used Minimum limitations projection 1/2", radius of corners 1/16", panel 1/8" and width of band 3/8".



CORNICES

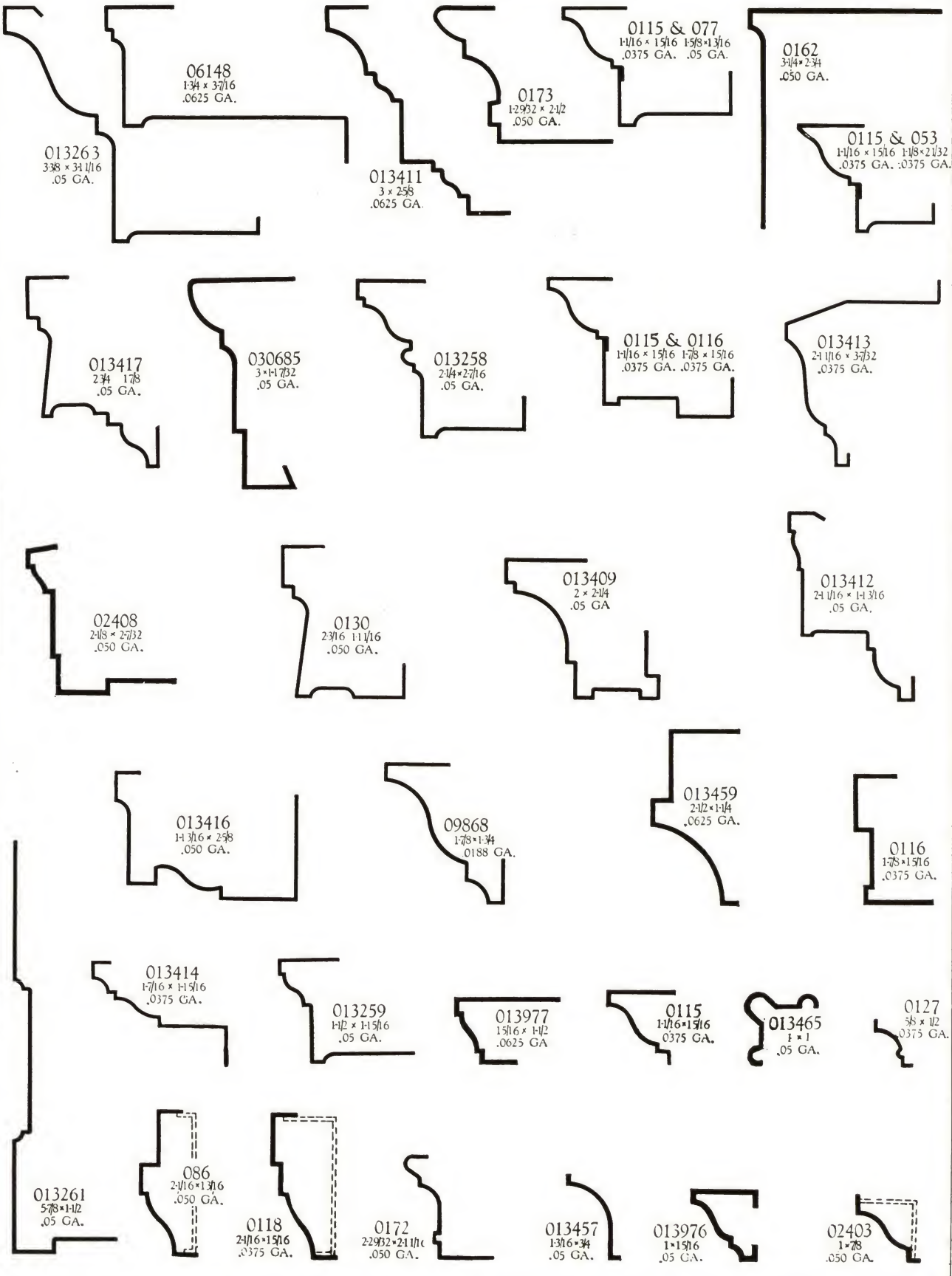


SCALE 1/2 F. S.

ART METAL MOULDINGS

PLATE 7

CORNICE MOULDINGS

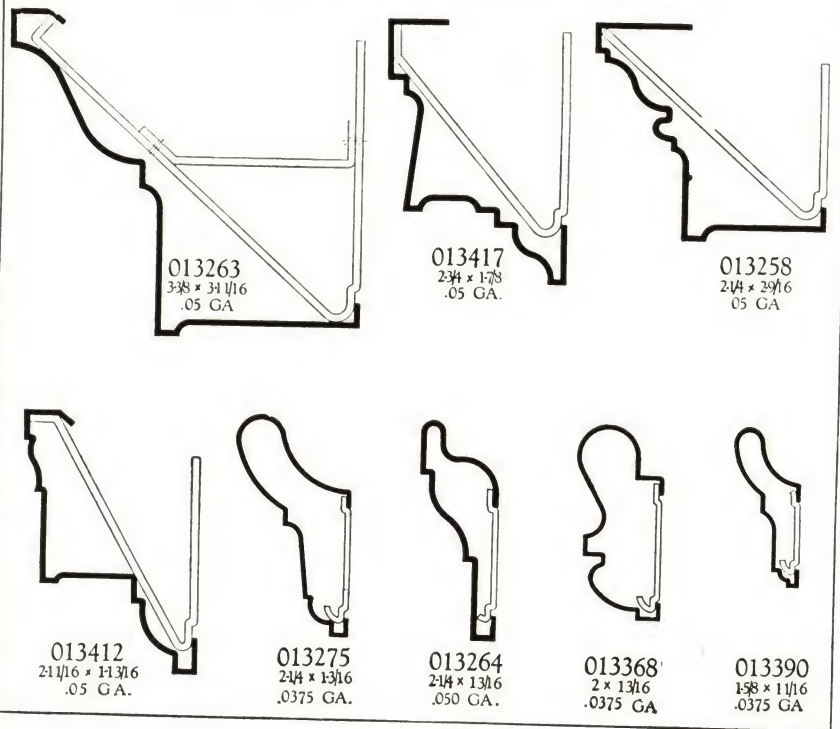


SCALE 1/2 F. S.

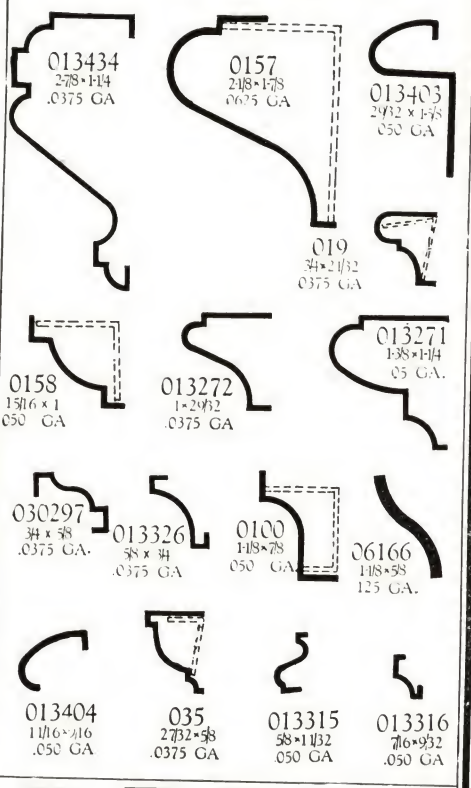
ART METAL MOULDINGS

PLATE 8

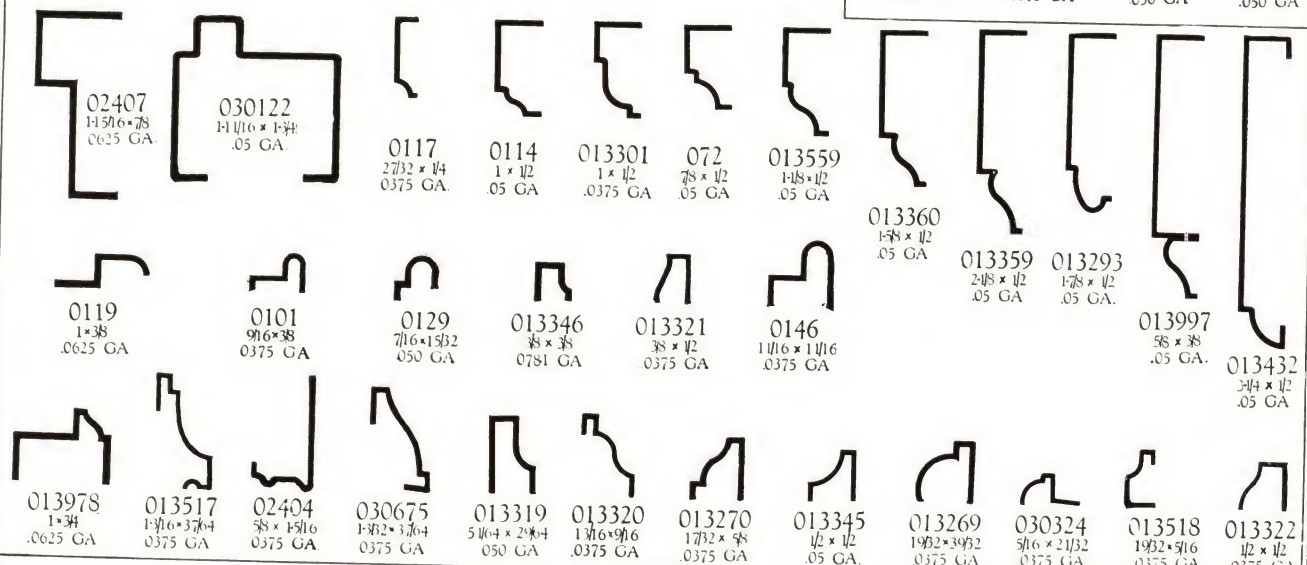
WIRE AND PICTURE MOULDINGS



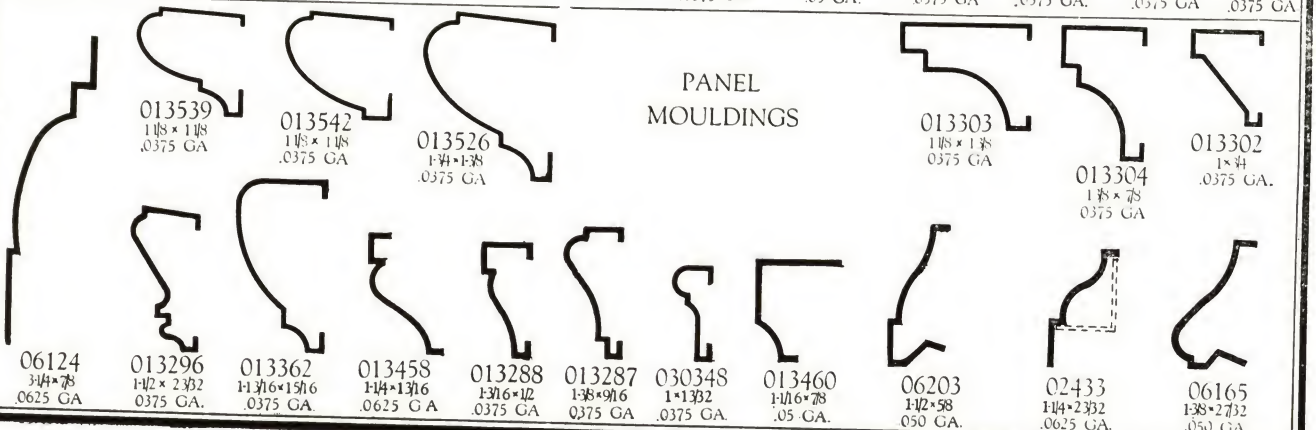
SCRIBE AND BED MOULDINGS



GLASS STOPS



PANEL MOULDINGS

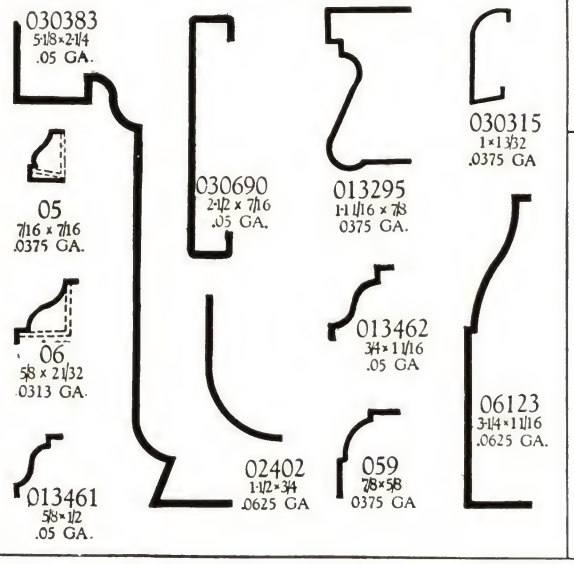


SCALE 1/2 F.S.

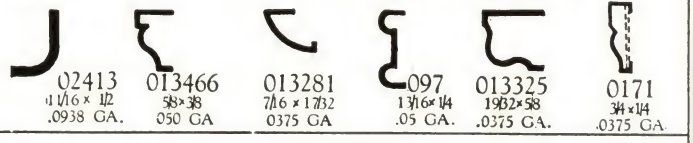
ART METAL MOULDINGS

PLATE 9

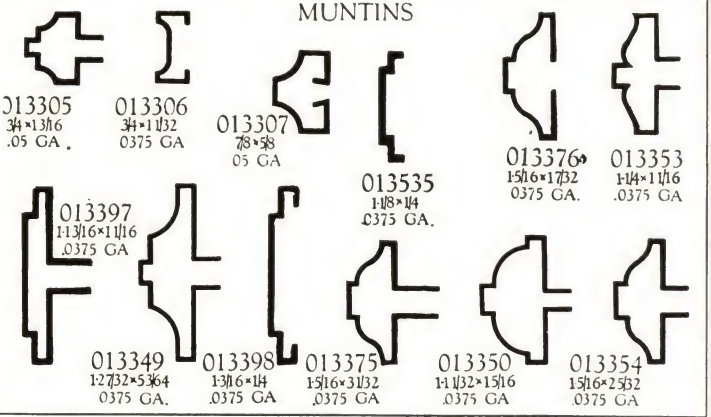
BASE MOULDINGS



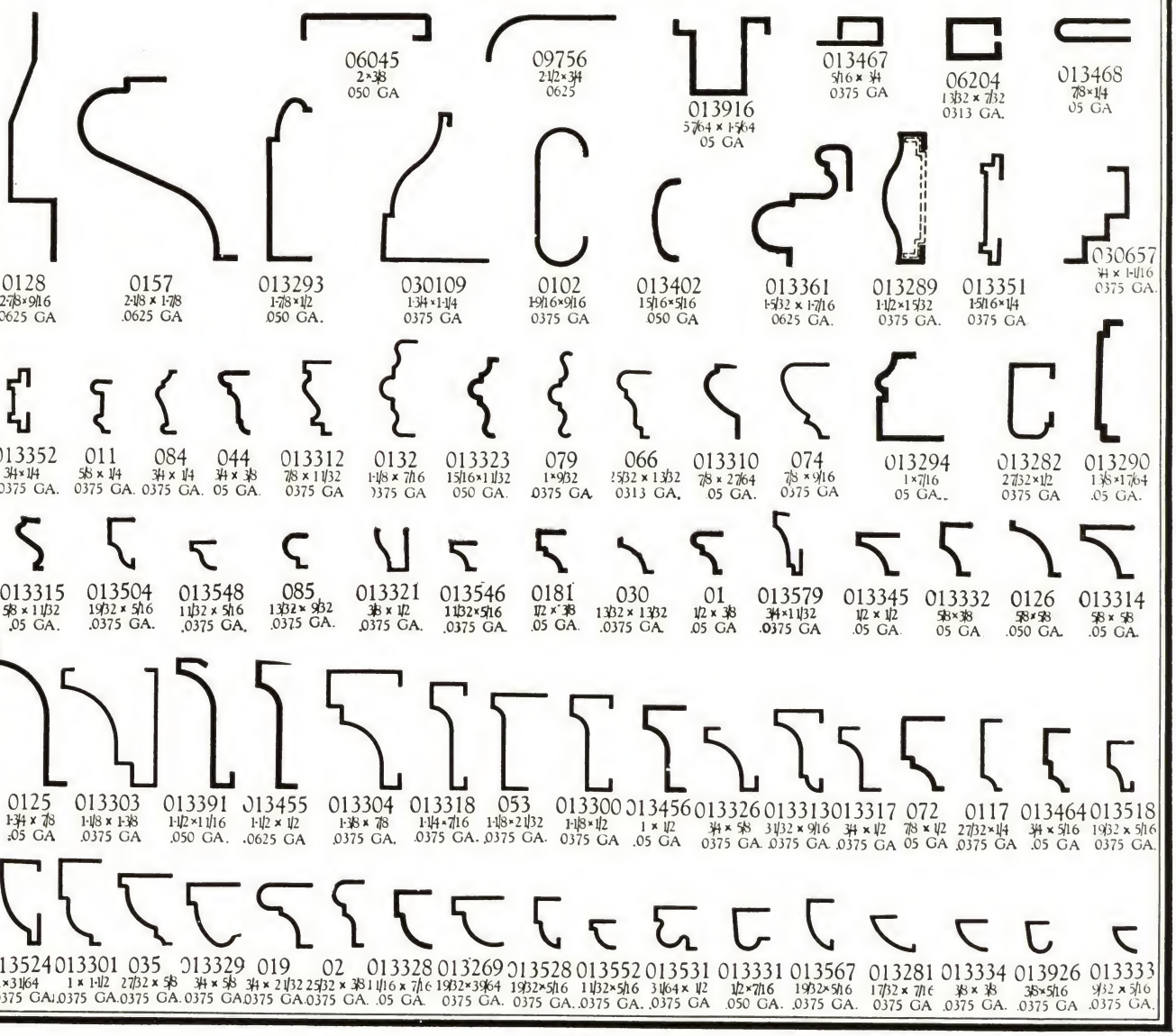
PANEL MOULDINGS (CONTINUED)



MUNTINS



MISCELLANEOUS MOULDINGS

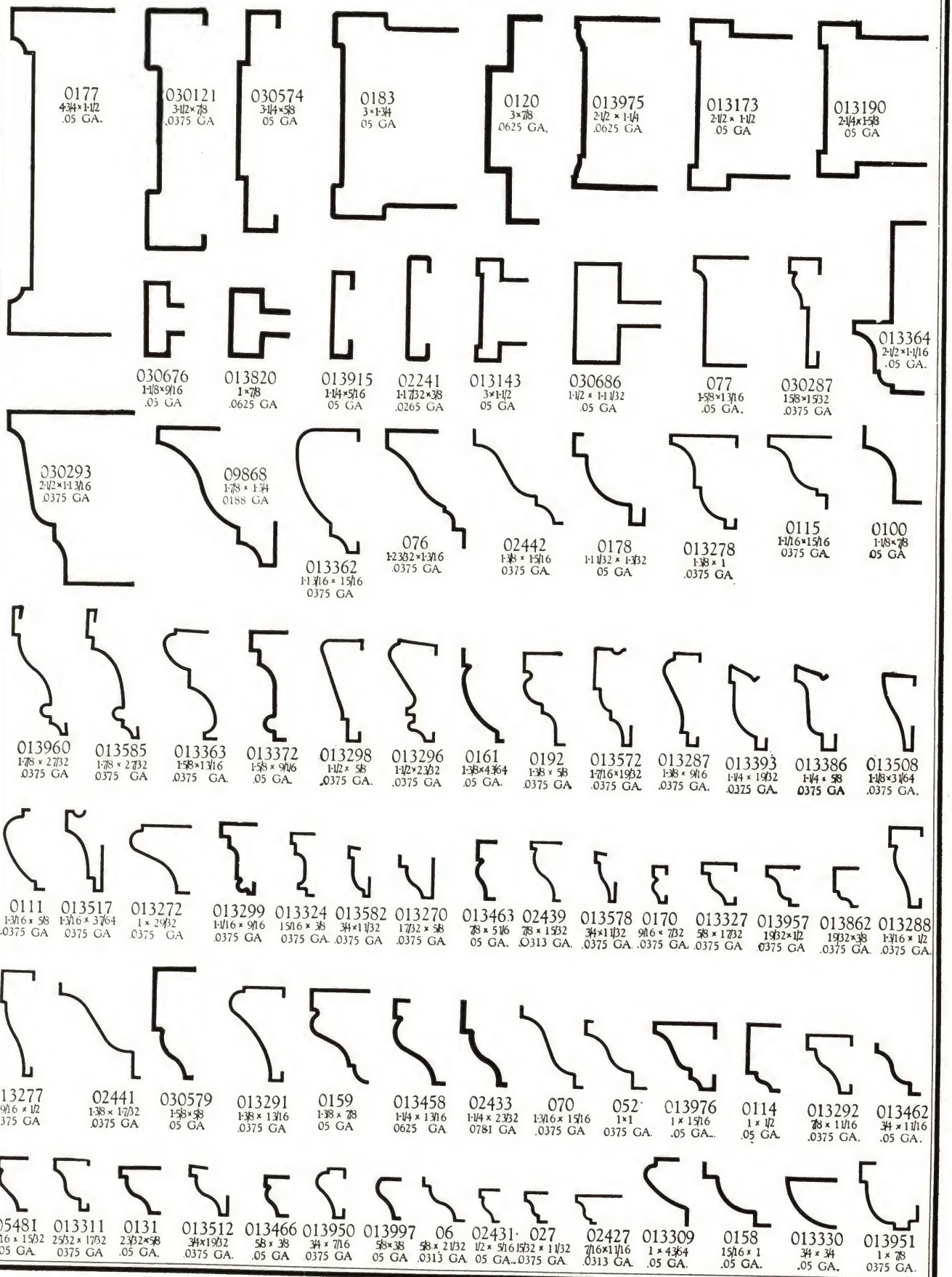


SCALE 1/2" F.S.

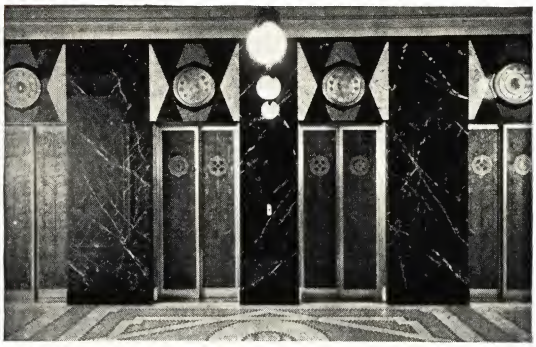
ART METAL MOULDINGS

PLATE 10

MISCELLANEOUS MOULDINGS



ELEVATOR ENCLOSURES



BRONZE ELEVATOR ENCLOSURES WITH 2-SPEED DOORS AND FLOOR INDICATORS
Henry Building, Seattle, Wash.
R. C. Riemer, Architect
Tourtellote Bradley Co., General Contractor

ETCHED STEEL PANELS AND CAST BRONZE MOULDING
First National Bank, St. Paul, Minn.
Graham, Anderson, Probst & White, Architects
Paul Steenberg Co., General Contractors

BRONZE 2-SPEED DOORS WITH INSIDE GATES
R. H. Macy Co., New York, N. Y.
R. D. Kohn, Architect
Marc Eidlitz & Co., General Contractor

WROUGHT BRONZE 2-SPEED AND SWING ELEVATOR DOORS
Chemical Bank, New York, N. Y.
E. H. Faile & Co., Architects and Engineers
Starrett Bros., Inc., General Contractors

Elevator Enclosures

The plate illustrations on the following pages show the styles of elevator enclosures in general use and are shown with combination buck and jamb frame. Any of these styles can be furnished in rough buck or structural buck and finished jamb with casings or scribe mouldings as required. Art Metal elevator enclosures make proper provision for the reception of all operating appliances and safety devices.

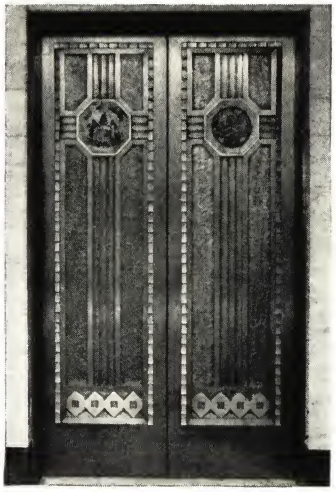
Underwriters' Labels on Elevator Enclosures—"Inspected Fire Door for Passenger Elevator Opening in Vertical Shaft." Size limitation: for single doors, 4x8 ft.; for pairs, 8x8 ft.

Dumbwaiter Enclosures

Dumbwaiter enclosures of any size, with frames of either combination buck and jamb or buck and finished jambs, with or without casings, can be supplied. Unless otherwise specified, pulleys, weights and chains will be furnished with the units.

CAST BRONZE ELEVATOR DOORS
Henry Building, Seattle, Wash.
R. C. Riemer, Architect
Tourtellote Bradley Co., General Contractor

CAST BRONZE BI-PARTING ELEVATOR ENCLOSURES
Buckeye State Building & Loan Assn., Columbus, Ohio
Hopkins & Dentz, Architects



BRONZE ELEVATOR DOORS
Camden County Court House, Camden, N. J.
Edwards & Green, Architects

CAST BRONZE BIPARTING DOORS WITH CAST ALUMINUM MEDALLIONS
Camden County Courthouse, Camden, N. J.
Edwards & Green, Architects
F. W. Marks Construction Co., General Contractors

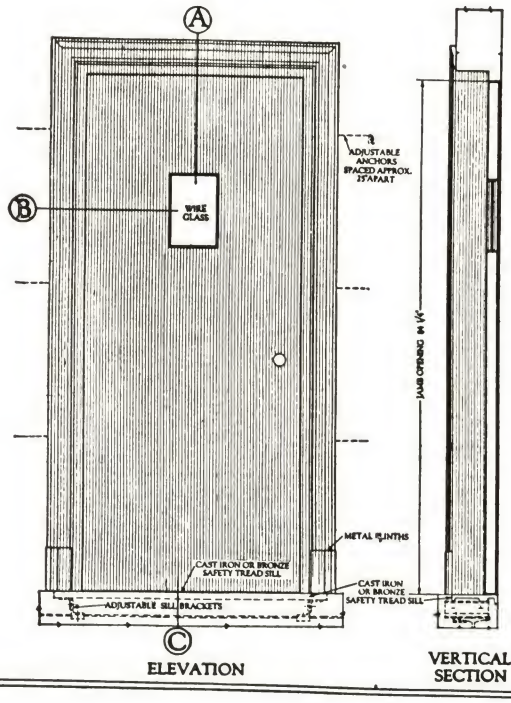
SCALE 1/4", 3/8", 1", 11/2"

ELEVATOR ENCLOSURES

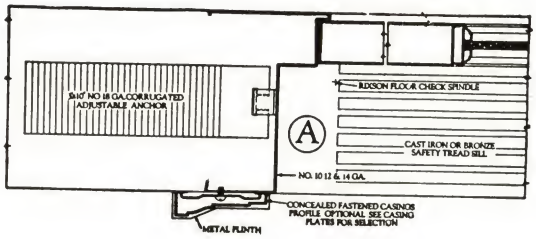
PLATE 11

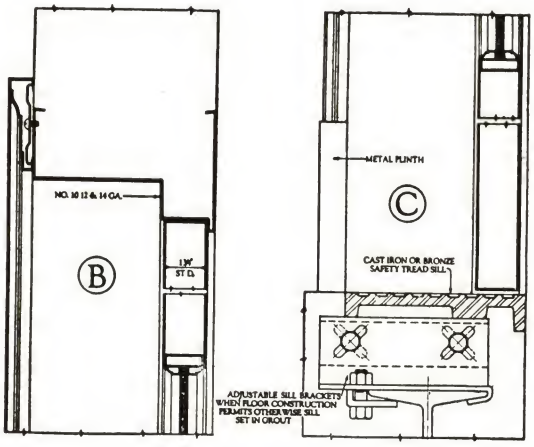
AUTOMATIC (PUSH BUTTON) UNIT

PLAN



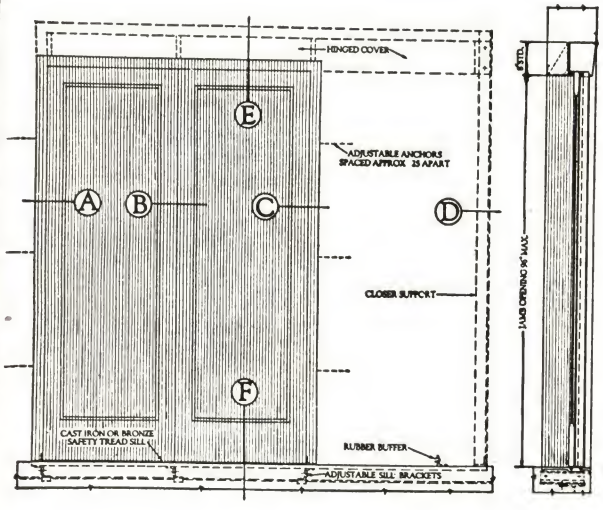
ELEVATION VERTICAL SECTION



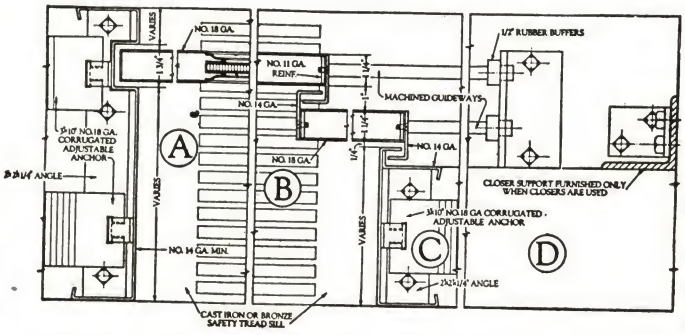


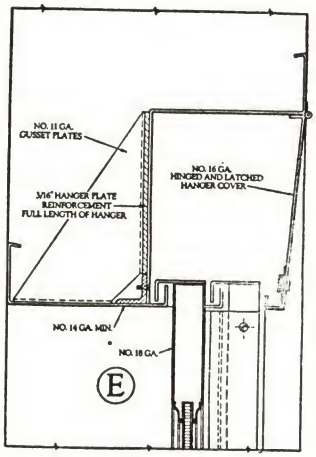
TWO SPEED LABELED UNIT

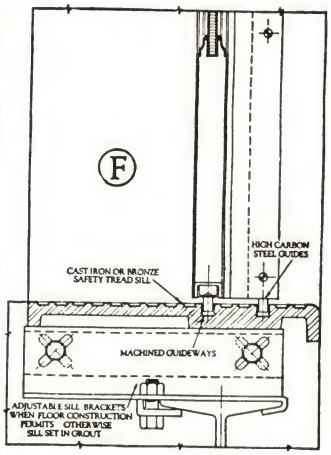
PLAN



ELEVATION VERTICAL SECTION





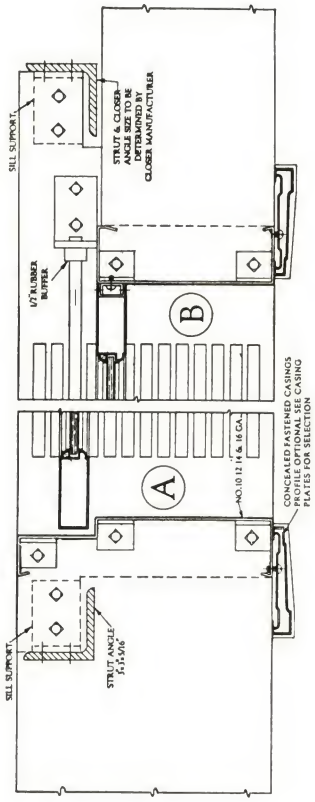


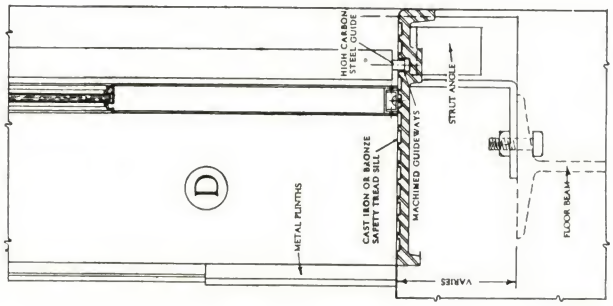
SCALE 3/8" & 1 1/2"

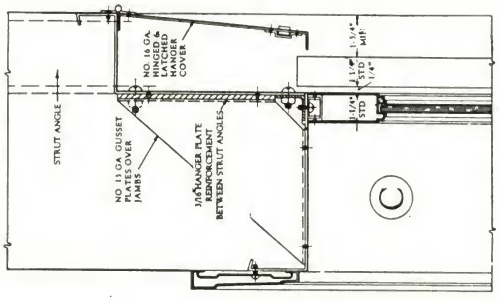
ELEVATOR ENCLOSURES

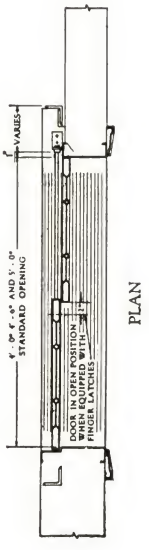
PLATE 12

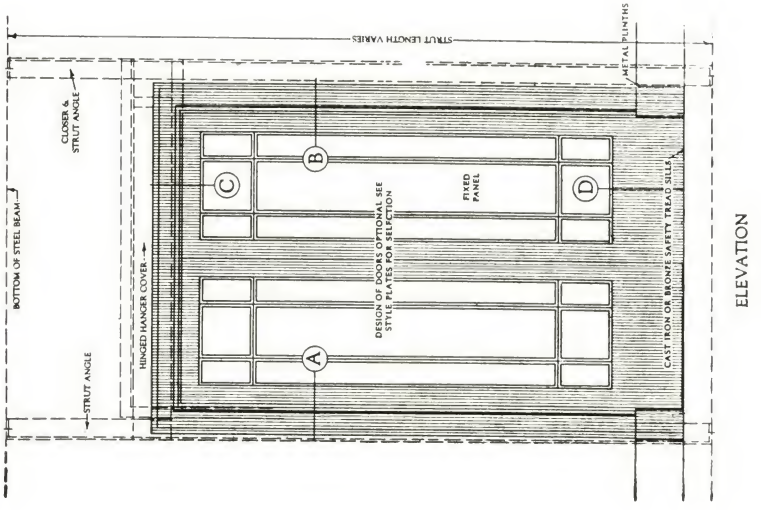
SLIDE & FIXED PANEL UNIT









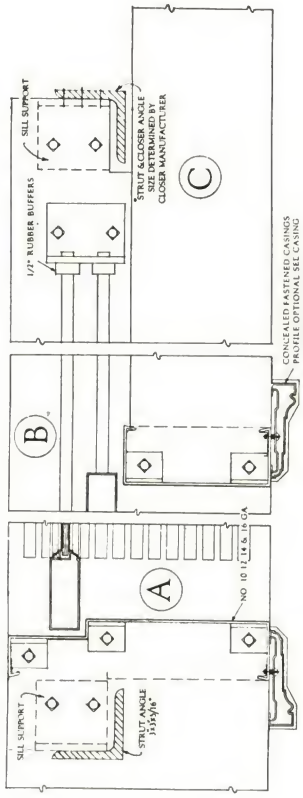


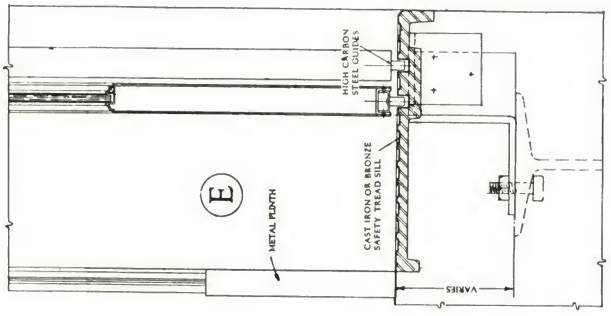
SCALE 3/8" & 11/2"

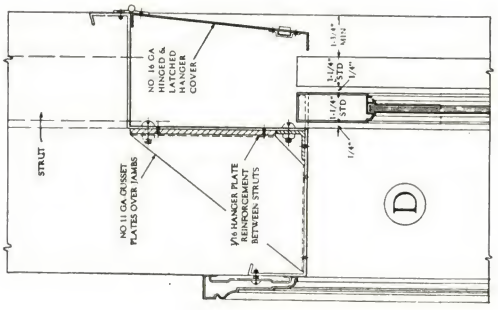
ELEVATOR ENCLOSURES

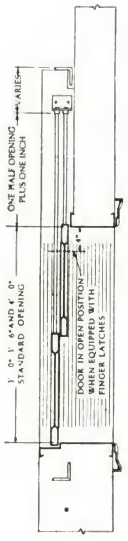
PLATE 13

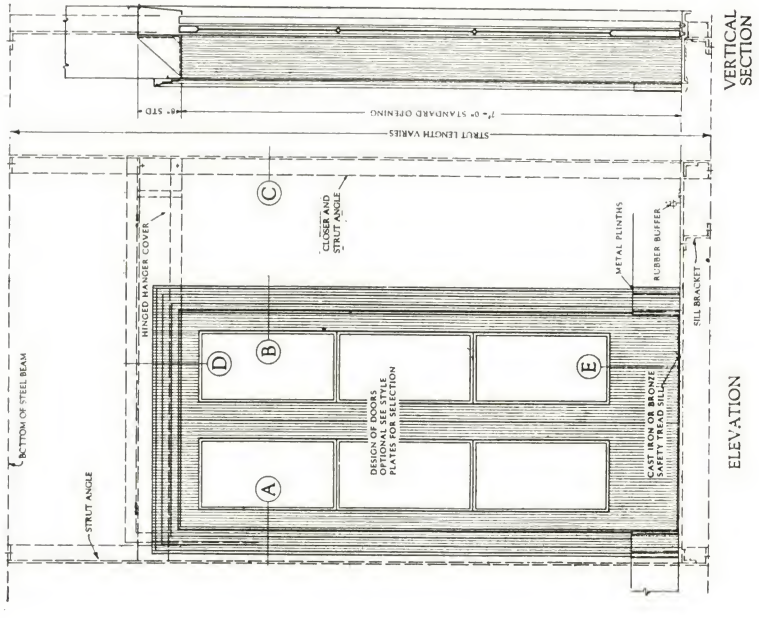
TWO SPEED UNIT









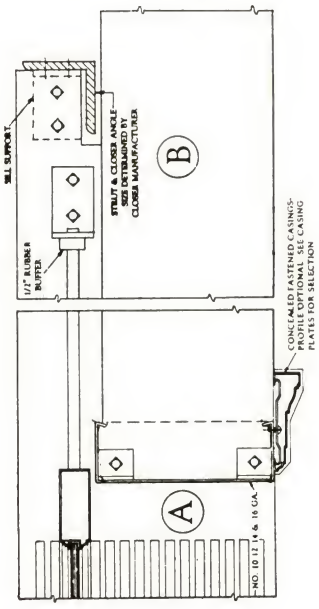


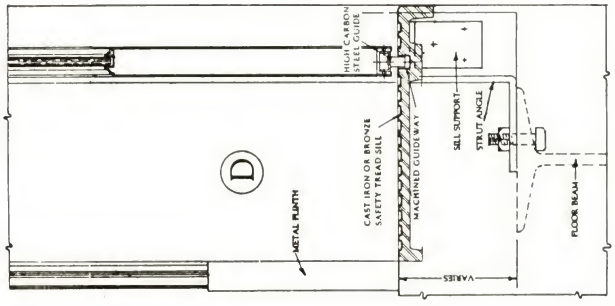
SCALE 3/8" & 11/2"

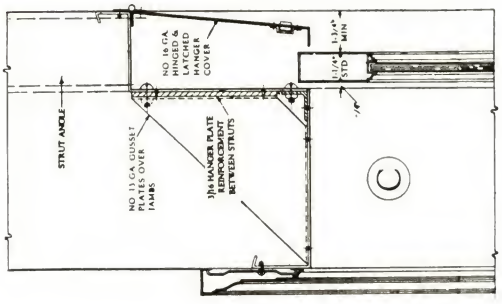
ELEVATOR ENCLOSURES

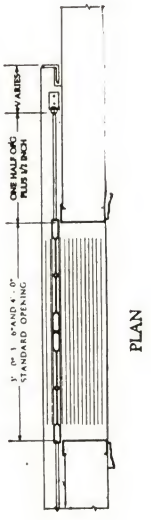
PLATE 14

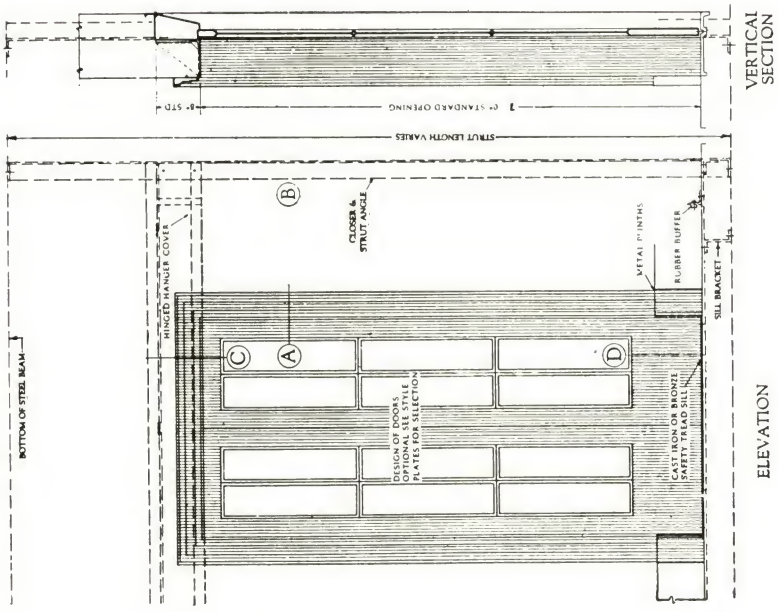
CENTER OPENING UNIT









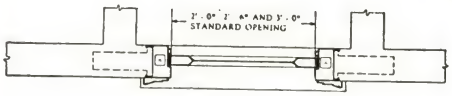


SCALE 3/8" & 1 1/2"

DUMB-WAITER ENCLOSURES

PLATE 15

SINGLE PANEL UNIT



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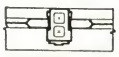
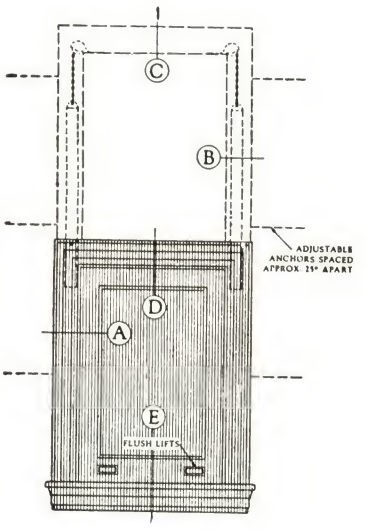
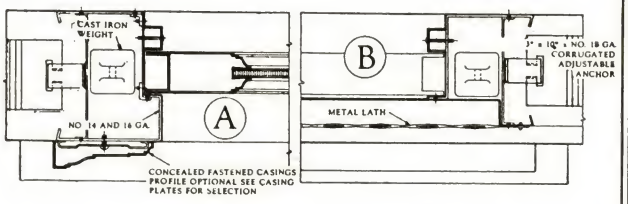
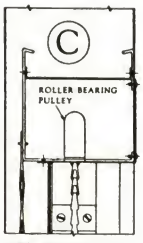


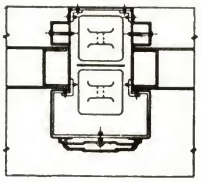


ELEVATION

VERTICAL SECTION







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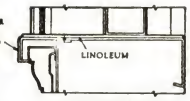
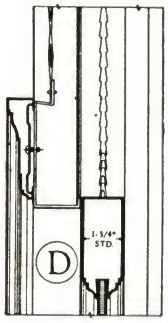
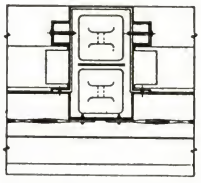


DETAIL OF LINOLEUM TOP





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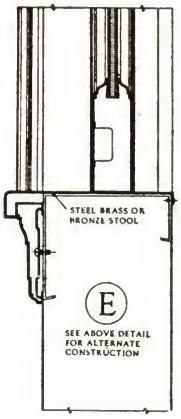
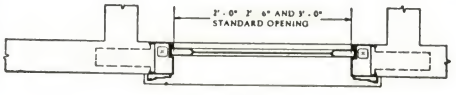


DOUBLE PANEL UNIT



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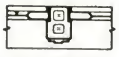
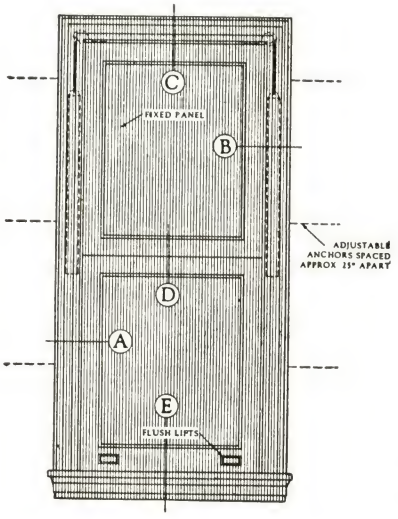
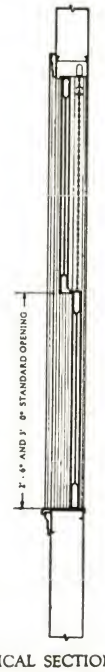
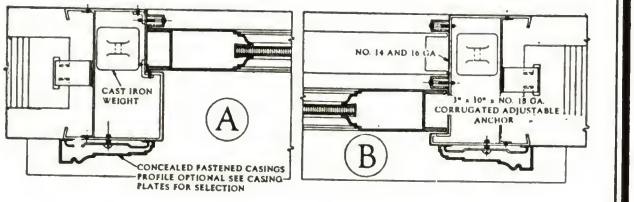


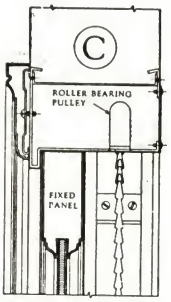


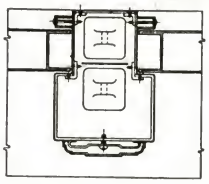
ELEVATION



VERTICAL SECTION







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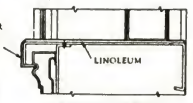
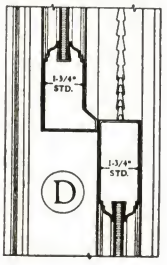
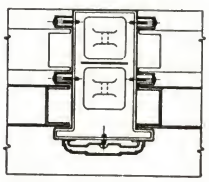
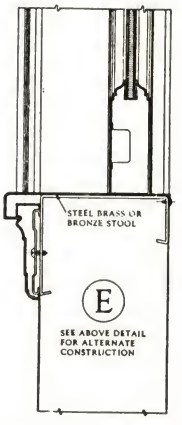


DETAIL OF LINOLEUM TOP





· MULLION · AT · SECTION · B ·



A. J. BAYER CO., INC.

Hollow Metal Doors

EXECUTIVE OFFICES AND FACTORY
Santa Fe and Slauson Avenues
LOS ANGELES, CALIF.

PRIVATE EXCHANGE
LAfayette 2171

SAN FRANCISCO BRANCH OFFICE: Capitol Art Metal Co., Inc.

BRANCH FACTORIES
SAN DIEGO, CALIF., Bayer-Offenhauser, Inc.
HOUSTON, TEX., Bayer-Voigtlander, Inc.

AGENCIES IN OTHER PRINCIPAL CITIES

For our page on Ornamental Iron and Bronze Work, see Manufacturers' Index

Experience

This company has served the building industries since 1900 in the manufacture and installation of ornamental metal and hollow metal in monumental and commercial buildings.

Facilities

A complete manufacturing plant and foundry is maintained for the execution of work ranging from miscellaneous iron work to the highest grade of architectural bronze and iron.

Nickel Silver Elevator Enclosure, Alexander & Oviatt Building, Los Angeles, Calif.

Hollow Metal Elevator Enclosure, Pacific Mutual Building, Los Angeles, Calif.

Recent Installations

Building	Architect
City Hall, Los Angeles, Calif.	Austin, Martin & Parkinson, Los Angeles, Calif.
Biltmore Hotel, Los Angeles, Calif.	Schultze & Weaver, New York, N. Y.
Forman and Clark Building, Los Angeles, Calif.	Curlett & Beelman, Los Angeles, Calif.
Jonathan Club, Los Angeles, Calif.	Schultze & Weaver, New York, N. Y.
Elks Club Building, Los Angeles, Calif.	Curlett & Beelman, Los Angeles, Calif.
Roosevelt Building, Los Angeles, Calif.	Curlett & Beelman, Los Angeles, Calif.
Bullock's, Los Angeles, Calif.	John and Donald B. Parkinson, Los Angeles, Calif.
Richfield Oil Building, Los Angeles, Calif.	Morgan, Walls & Clements, Los Angeles, Calif.

CAPITOL BRONZE CORPORATION

Hollow Bronze and Bronze Covered Doors

TELEPHONE
Greenpoint 9-6033

420 Morgan Avenue
BROOKLYN, N. Y.

AGENTS

AMARILLO, TEX., Vernon Williams Co. Inc., 203 W. 6th Street
ATLANTA, GA., V. H. Kriegshaber & Son, Inc., 666 Greenwood Avenue
CHICAGO, ILL., Henry A. Struck, 409 Burnham Building
CLEVELAND, OHIO, William A. Owens, 2021 Prospect Avenue
CLOVIS, N. M., Vernon-Williams Co. Inc.
COLUMBUS, OHIO, V. W. Ventilator Co., 471 E. Broad Street
DALLAS, TEX., Weaver Ornamental Works, 1801 Carty Street
HOUSTON, TEX., Walcott, Maisey & Paige, 328 West Building
LUBBOCK, TEX., Vernon-Williams Co. Inc., 1316 Texas Avenue
OKLAHOMA CITY, OKLA., The Lusco Brick & Stone Co.
PHILADELPHIA, PA., James H. Clancy, Harrison Building
PITTSBURGH, PA., J. H. Cunningham, Century Building
RICHMOND, VA., Earnest Bros., Inc., 805 East Franklin Street
SAN ANTONIO, TEX., J. L. O'Hearn, 617 Houston Building
SEATTLE, WASH., E. C. Hanselpacker & Co., 721 Virginia Street
ST. LOUIS, MO., August Court Co., 1020 Ambassador Building

Products

We specialize in the production of HOLLOW METAL DOORS in Bronze, Nickel Silver and Aluminum and in METAL COVERED WOOD DOORS using Bronze, Nickel Silver, Aluminum Allegheny Metal, Monel Metal or other material. For our Store Front Mouldings, see Manufacturers' Index.

Metal Covered Wood Doors

We build metal covered doors of superior quality. The wood stiles and rails are made from stock built up from strips of soft kiln dried pine glued together under high pressure. Rails and stiles are mortised and tenoned and locked together.

In the construction of "Capitol" bronze or aluminum covered doors each side of the stiles and rails is covered with a single sheet of metal without joints or welds of any kind, the metal opposite the depressed panels being cut from the sheet. This method of construction eliminates the possibility of seams and welds opening under constant use. It also considerably strengthens the door and prevents it from getting out of square. The sheet metal is glued to the wood skeleton door under tremendous pressure which assures lasting adhesion of the metal to the wood. Extruded glass mouldings and edge reinforcing mouldings are used for all metal covered doors.

Hollow Metal Doors

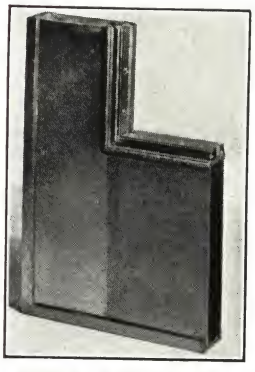
The stiles and rails of "Capitol" hollow bronze doors are constructed from extruded metal sections of our own design. The stiles and rails are built up of a U-shaped edge section interlocking with a section which forms the panel shoulders. The two sections are held together not only by the mechanical interlock but the abutting surfaces are also sweated together. Corners are reinforced and held together not only by sweating adjoining surfaces but by blind screws and rivets.

Hollow metal doors will be provided with either built-up or solid sheet panels as preferred.

Hardware cutouts will be carefully made and suitably reinforced.

Finishes

Doors of either hollow metal or metal covered wood will be finished as desired, either with polished, dull or oxidized finish. We have complete facilities for finishing panels with etched designs now so popular. Orders for doors should be accompanied by a sample of the finish desired or we shall gladly send samples to aid in making a selection. Where combination finishes in design are to be executed large scale or full size drawings must be submitted.



Section Hollow Metal Door

Etched Bronze Lobby Doors, Mayfair Theater, New York, N. Y.
THOMAS W. LAMB, Architect M. SHAPIRO & SON, Builders

Section Metal Covered Door

THE CINCINNATI MFG. CO.

Kalamein and Hollow Metal Doors

CINCINNATI, OHIO

Products

HOLLOW METAL DOORS and TRIM of aluminum, bronze, nickel silver and other metals.

HOLLOW METAL DOORS bearing Underwriters' Laboratories Inc. label of approval.

COLLAPSIBLE GATES for elevator cabs.

Also Kalamein Doors and Trim of aluminum, bronze, nickel silver and other metals; Elevator Enclosures and Cabs; Metal Doors and Trim, Grilles, Hand Rails, Base, etc., for elevator cabs.

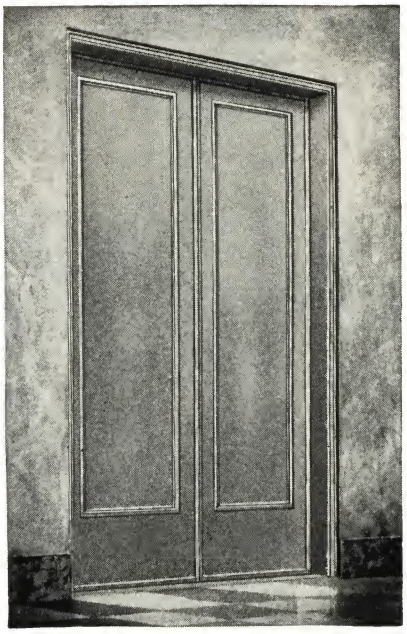
For our page on Architectural and Ornamental Metal Work, see Manufacturers' Index.

CINMANCO 1844
TRADE-MARK

Hollow Metal Doors

Made to architect's designs in special finishes permitting a wide range of individual expressions, or in stock patterns and standard finishes. Thoroughly insulated throughout to insure an efficient fire retardant and to prevent metallic sound. The construction obviates necessity of installing jamb during erection of walls, and permits hanging and adjusting of doors independently of frames. The Underwriters' Laboratories, Inc., have tested and approved these doors and their label is affixed to them when required.

Catalogue No. 53 sent on request.



Bronze Elevator Doors, Texas Hotel, Ft. Worth, Texas

Cinmanco Collapsing Gate for Elevator Cabs

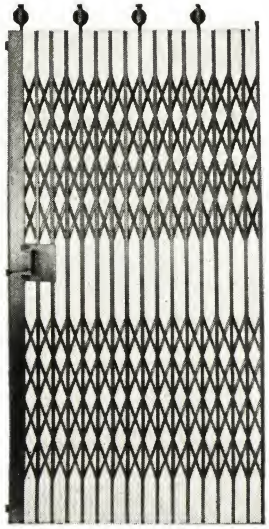
An improved type perfected by CINMANCO engineers and backed by years of manufacturing experience. Quiet, smooth operation is made possible by several exclusive features of construction. Made in steel, nickel silver, bronze, and other metals. Write for special literature on collapsing gates.

Experience

Through the thoroughly trained CINMANCO organization the architect finds precise interpretation of his designs. Since 1844 it has been our privilege to serve leading architects in the execution of their plans for metal work in many of America's finest buildings. Here are a few of the more recent CINMANCO installations:

U. S. Post Offices at Taunton, Mass.; Clarksburg, W. Va.; Camden, N. J.; Sedalia, Mo.; Mason City, Iowa; Tulsa, Okla.
Warner Bros. Theatre, Youngstown, Ohio
Butler Art Institute, Youngstown, Ohio
Toledo Art Museum, Toledo, Ohio
Louisville Trust Co., Louisville, Ky.
Good Samaritan Hospital, Lexington, Ky.
Union Trust Building, Little Rock, Ark.
The Fair Store, Fort Worth, Tex.
Cincinnati Club, Cincinnati, Ohio

Aluminum Doors, Carew Tower, Cincinnati, Ohio



Cinmanco Collapsing Gate for Elevator Cabs

Design C26 Elevator Car

ESTABLISHED 1911

ELLISON BRONZE COMPANY, INC.

Manufacturers of Ellison Welded Bronze Doors, Ellison Welded Aluminum Doors and Ellison Balanced Doors

JAMESTOWN, N. Y.

For Representatives, see our page on Ornamental Metal Work

For our pages on Cast and Hollow Bronze Products and Louvre Ventilators, see Manufacturers' Index

ELLISON WELDED BRONZE DOORS

Specifications

1—Doors—To be made by Ellison Bronze Company, Inc., of Jamestown, N. Y., of 11-gauge ($\frac{3}{32}$ in. thick) Anaconda architectural bronze, formed to sizes and shapes indicated for the various stiles and rails. All arrises to be made sharp and true. Joints where stiles meet rails to be accurately fitted and welded, completely fusing the metal and dressing down so that the joints will be absolutely invisible. Brazing, screwing. or riveting through faces, discolored or pitted joints will not be acceptable.

2—All Plain Mouldings—To be of extruded bronze, not less than $\frac{1}{8}$ in. thick and of contours as indicated, with sharp and true arrises and mitres accurately cut and neatly fitted. Removable mouldings for the glass to be provided with neat oval head bronze screws of same natural color as the mouldings, stiles and rails. All other fastenings must be concealed.

3—Panels—To be of two sheets of 14-gauge bronze with deadening felt between. Proper reinforcements to be provided for the application of hardware.

4—Ornate Mouldings, Panels or Applied Ornaments—To be of cast bronze to match the natural color of extruded bronze and to be of fine texture with sharp lines, accurate profiles and ornament true to pattern. Castings to be free from all defects which may impair appearance, strength or durability, and to be of ample strength for the purpose for which intended. All mouldings and ornament to be in perfect alignment; mitres machined or filed to a correct fit.

5—Finish—To be hand rubbed velvet finish. Highlights of cast ornament to be lightly buffed. Unless otherwise directed, the bronze work to be left in its natural color (Golden Bronze), clean and without mars, stains or flaws, and with an application of a protective coating of oil, wax or clear lacquer, as may be required.

ELLISON WELDED ALUMINUM DOORS

Specifications

1—Doors—To be made by Ellison Bronze Company, Inc., of Jamestown, N. Y., of 11-gauge ($\frac{3}{32}$ in. thick) sheet aluminum, manufactured by the Aluminum Company of America and known as their 3S ¾ hard gray plate, formed to sizes and shapes indicated for the various stiles and rails. All arrises to be made sharp and true. Joints where rails meet stiles to be accurately fitted and welded, completely fusing the metal and dressing down so that the joints will be absolutely invisible. Screwing, or riveting through faces, discolored or pitted joints will not be acceptable.

2—All Plain Mouldings—To be Aluminum Company of America's No. 51SW extruded aluminum moulding, not less than $\frac{1}{8}$ in. thick and of contours as indicated, with sharp and true arrises and mitres accurately cut and neatly fitted. Removable mouldings for the glass to be provided with neat oval head aluminum screws of same natural color as the mouldings, stiles and rails. All other fastenings must be concealed.

3—Panels—To be two sheets of 14-gauge aluminum with deadening felt between. Proper reinforcements to be provided for the application of hardware.

4—Ornate Mouldings, Panels or Applied Ornaments—To be of cast aluminum, known as Aluminum Company of America's Alloy No. 43, of fine texture, and with sharp lines, accurate profiles and ornament true to pattern. Castings to be free from all defects which may impair appearance, strength or durability and to be of ample strength for the purpose for which intended. All mouldings and ornament to be in perfect alignment; mitres machined or filed to a correct fit.

5—Finish—To be No. 120 emery velvet finish. Highlights of cast ornament to be lightly buffed. The aluminum work to be left in its natural color, clean and without mars, stains or flaws and with an application of a protective coating of wax.

ELLISON BALANCED DOORS

(Patents Pending)

Description

The Ellison Balanced Door has been developed by us for the entrances of public buildings, schools, etc., in response to the urgent need for a door which could be easily opened against high wind pressure.

Ellison Balanced Doors are particularly recommended for use in entrances which are subject to heavy traffic. Because of their very ease of operation, they are highly desirable for school buildings—especially primary schools and kindergartens.

When opening an Ellison Balanced Door, only half of the 30-in. wide door swings outward, against the wind, and the other half swings inward, with the wind. The door automatically counterbalances the wind pressure at all angles, from closed to wide open positions. It is also balanced against wind pressure or suction from the inside of the building.

Ellison Balanced Doors can always easily be opened by a little child, standing on an icy, slippery pavement, against high wind pressure which would defy a strong man's attempt to open an ordinary swing door, even though he had a secure footing on a dry, clean pavement.

Ellison Balanced Doors are unconditionally guaranteed against all defects in material and workmanship. They are made of bronze or aluminum and installed complete only by the Ellison Bronze Company, Inc.

Literature and complete information gladly mailed on request.

DAHLSTROM METALLIC DOOR COMPANY

EXECUTIVE OFFICES AND FACTORIES
JAMESTOWN, N. Y.

BRANCH OFFICES
NEW YORK, N. Y., 475 Fifth Avenue CHICAGO, ILL., 19 So. La Salle Street DETROIT, MICH., 1331 Dime Bank Building
PACIFIC COAST PLANT: 3350 East Slauson Avenue, LOS ANGELES, CALIF.

REPRESENTATIVES IN PRINCIPAL CITIES

Products

Manufacturers of METAL DOORS and METAL TRIM; ELEVATOR ENTRANCES.

Also Conduo-Base, General Trim for office buildings, hotels, apartments, hospitals, schools, banks, theaters; Hose Cabinets and Switch Box Panels; Partitions and Library Stacks.

For Adjustable Steel Partitions, see Manufacturers' Index.

Dahlstrom Metal Doors and Trim

Design—Metal doors were originated by the founder of this Company. Twenty-five years of designing and manufacturing doors and trim to meet various conditions have given Dahlstrom products the well-earned title of "The Specified Standard."

Construction—Dahlstrom Metal Doors and Trim have during a quarter of a century proved their fire-retarding value.

All joints are carefully welded. Reinforcements provided where necessary are also welded to the construction members. The design of Dahlstrom Metal Doors insures rigidity, stability, fire protection and elegance.

Door frames are fabricated from Nos. 16 to 11 gauge metal according to the size of the opening and the service required.

Finish—All surfaces are thoroughly cleaned before finish is applied. Each coat of paint or enamel is carefully baked and properly treated to secure the superior finish for which Dahlstrom products are noted. The same care and attention is given all finishes, whether plain colors, stipples or reproductions of wood graining. All material for finishing is carefully tested in our laboratories.

Quality—Dahlstrom products are internationally known. Only the expert workmanship and first-class materials entering into their manufacture can sustain this reputation.

General Instructions

The following pages will give an idea as to the great variety of door designs and door types that can be furnished. The door opening sizes and the dimensions of stiles and rails should be established in accordance with the recommendations set forth under the auspices of the Bureau of Standards of Washington, D. C. The main features of those recommendations are shown below.

Various meeting stiles, types of frames and general hardware locations are shown on the following three pages.

General information with reference to elevator entrances is also given on the following pages. For information regarding metal partitions, refer to Manufacturers' Index.

SHORT FORM SPECIFICATIONS FOR DAHLSTROM STEEL SWING DOORS

The work embraced under this heading shall be furnished strictly in accordance with the specifications herein outlined.

Materials

All steel used in the construction of the doors and trim shall be of the best grade open hearth full cold rolled, full pickled, double annealed, patent leveled sheet steel entirely free from scale and pits, of the United States standard gauges herein under the various headings.

Workmanship

All work shall be executed and finished to conform to the generally accepted standards established by the DAHLSTROM METALLIC DOOR COMPANY of Jamestown, N. Y. The finished work in all cases shall be neat in appearance and free from defects. All surfaces shall be smooth and free from warps and buckles; all moulded members shall be clean cut, straight and true; all miters shall be well formed and in true alignment; all welded joints shall be neatly made and cleaned off flush.

Construction

All doors, rough bucks, jambs, casings, borrowed light and transom sash, base mouldings, picture mouldings, wire mouldings, metal partitions and railings shall be constructed in accordance with the standard practices established by the DAHLSTROM METALLIC DOOR COMPANY (complete specifications furnished on request).

Finish

All preparations for finishing, all prime coating and final finishing shall be done in accordance with the standard practices of DAHLSTROM METALLIC DOOR COMPANY (complete specifications on request).

Erection

The materials embraced in this specification shall be set in place at locations designated on the Architect's plans and to levels established by the General Contractor or Architect's superintendent. Bucks and frames shall be plumb and true to insure satisfactory operations of the doors.

Cleaning and Final Finishing

The Erection Contractor who is in charge of setting this material shall leave the finished material clean and in condition satisfactory to the Architect. The Painting Contractor shall clean and finish in a manner satisfactory to the Architect only such portions of this material as are furnished by this contractor in prime finish.

SHORT FORM SPECIFICATIONS FOR DAHLSTROM ELEVATOR ENTRANCES

The elevator entrances are to be Dahlstrom Standard Construction and with stock design mouldings. This contractor is to assume complete and undivided responsibility for the complete elevator entrances which consist of doors, frames, strut angles, closer support angles, headers, hanger cover plates, sills, facia plates, glass, glazing, hangers and erection.

Unit Frames

The unit frames shall be made from No. 14 U. S. standard gauge best grade furniture steel, and to conform to details shown. The header shall be formed from $\frac{3}{16}$-in. thick steel. The component members, constituting the unit frame, consist of header with hanger cover plate, closer support angle, strut angle and frame of door opening. Suitable structural angles for closer support and struts are to be provided, which are to be secured to sill and structural beam. Header is to be secured to closer and strut angles. Frames are to be secured to sill and header.

Sills

The sills shall be cast iron or bronze as required, and will have approved non-slip surface. The castings are to have machine groove slots to receive door guides. Clearance between guides and side of slots not to exceed .005 in.

Doors

The doors to be made in accordance with design indicated on plans. Stiles and rails will be formed from No. 18 U. S. standard gauge furniture steel. Joints at intersections will be welded full length. Panels will be made from two plates of furniture steel, separated by insulations of the proper dimensions to make the overall thickness of panel $\frac{1}{4}$ in. The bottom of door will be provided with proper guides to work in slots in sill with clearance as specified under "Sills."

Casings

The casings are to be made from steel, and may be integral with the frame or applied to frame with concealed fastenings. Casing miters will be neatly welded and all miters ground perfectly smooth and even.

Hanger Covers

Hanger covers will be made from No. 14 U. S. standard gauge furniture steel and shall be constructed so as to permit access for servicing hangers.

Facia Plates

The facia plates will be made from No. 14 U. S. standard gauge steel and will extend from top of hanger to sill above. Facia plates will be properly reinforced and will be designed to conform to details shown on plans. Provide all necessary supports required to secure facia plates in place.

Glass

Glass (state whether clear wire or obscure wire) will be furnished and installed by this contractor. The glass will be set in rubber channels and held in place with glazing moulding, secured with oval head machine screws.

Hangers

Hangers to be of approved type as manufactured by manufacturer furnishing the door operating equipment. Hangers to be furnished and erected by the door contractor to be heavy duty hangers for power operation and light duty hangers for manual operation.

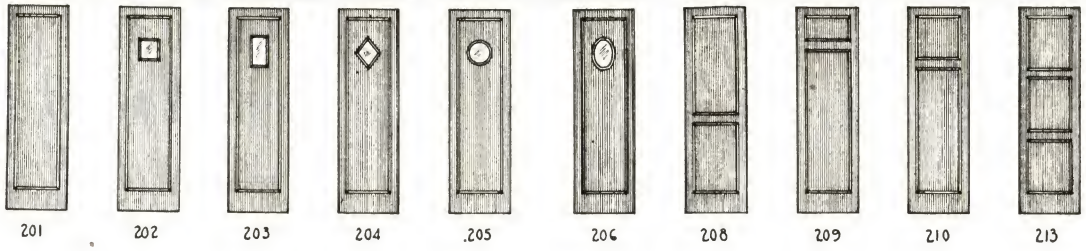
Finish

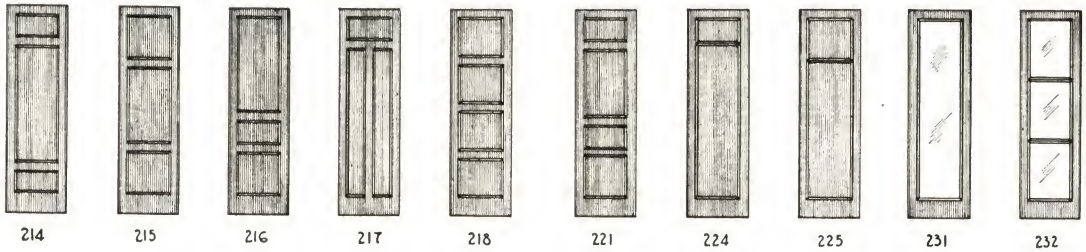
All structural parts will be coated with rust-inhibiting paint. Doors, frames, casings and other exposed parts are to have baked enamel finish. Specify whether to be plain enamel, stippled or grained.

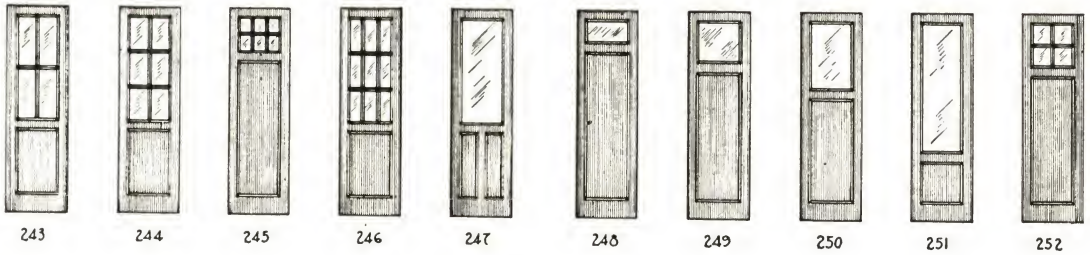
Erection

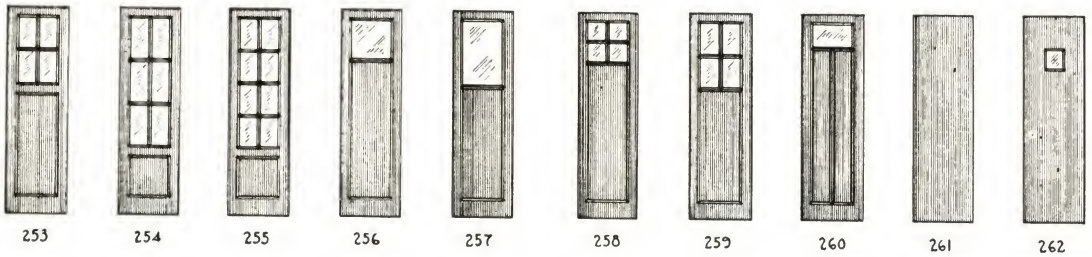
The erection of this work shall be done by this contractor. All work is to be set in perfect alignment with elevator car opening and platform. Frames and headers to be fastened to structural supports which in turn shall be securely fastened to floor beams.

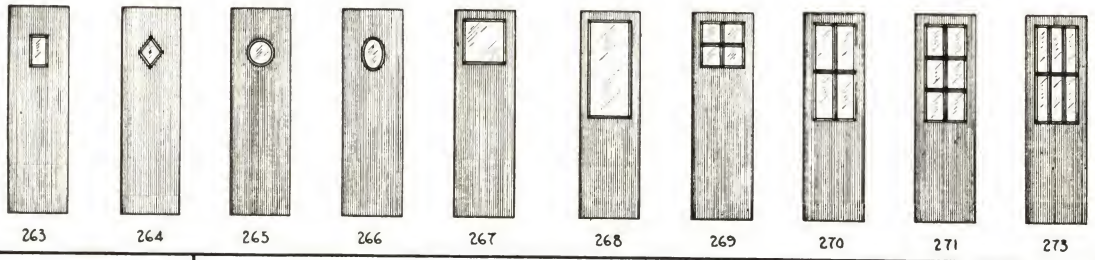
DAHLSTROM METALLIC DOOR COMPANY	STANDARD DOOR DESIGNS	PLATE NO. 1



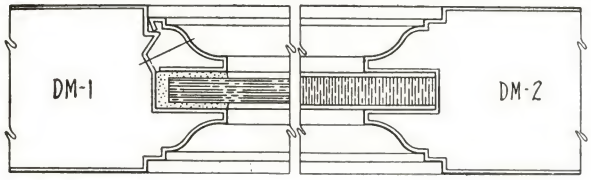


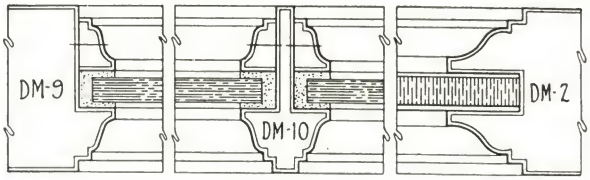


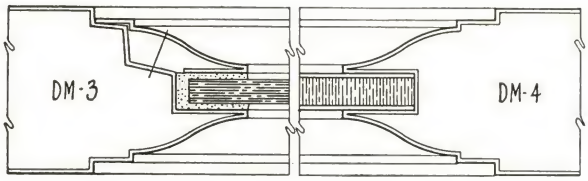


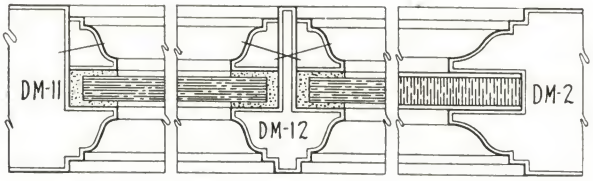


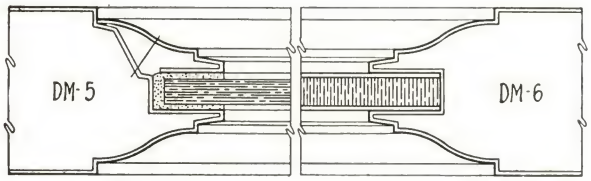
DAHLSTROM METALLIC DOOR COMPANY	STANDARD ELEVATOR DOOR DESIGNS	PLATE NO. 2

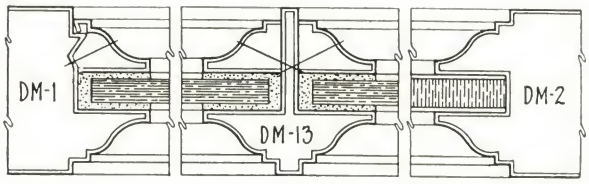


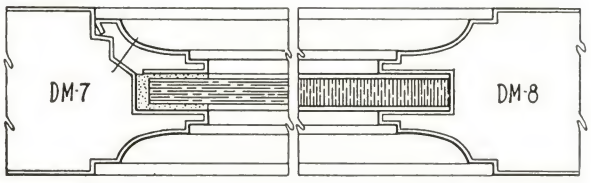


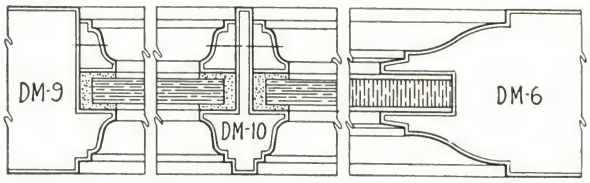


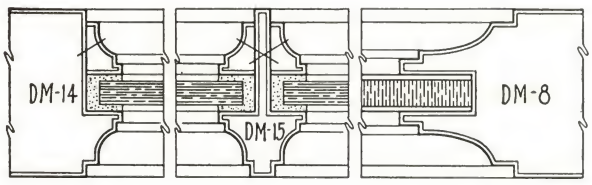


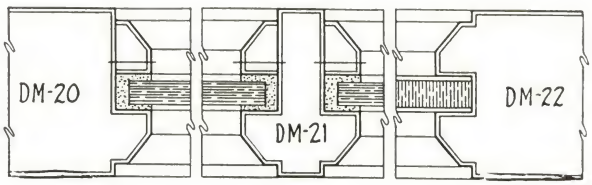


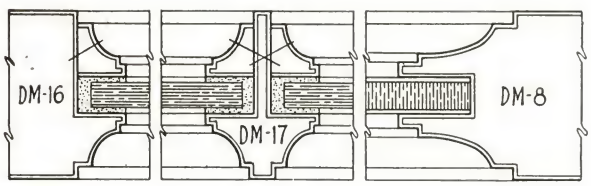


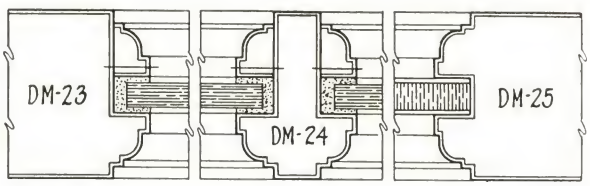


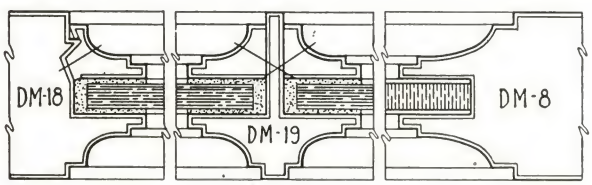


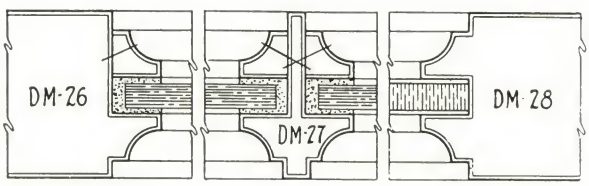


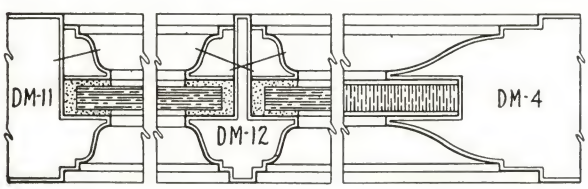








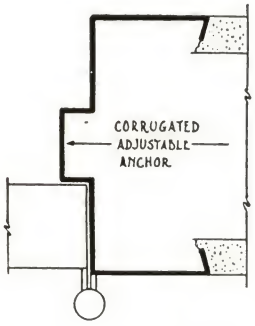




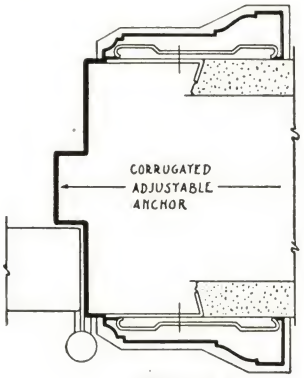
FLUSH DOOR THICKNESSES

FD-1	$1\frac{3}{4}$"	FD-3	$1\frac{1}{8}$"
FD-2	$1\frac{3}{8}$"	FD-4	1"

DAHLSTROM METALLIC DOOR COMPANY	SWING DOOR TYPES	PLATE NO. 3



TYPE D-1



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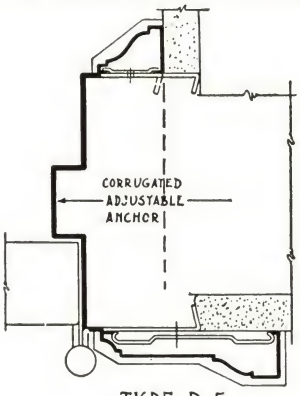

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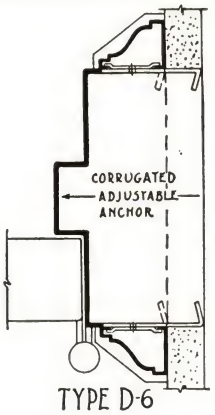

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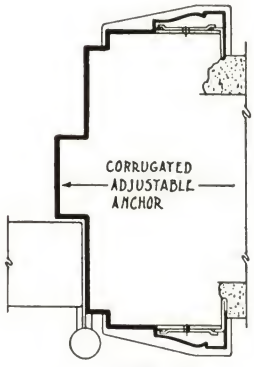

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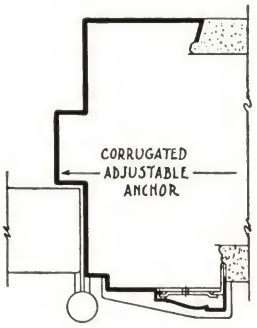

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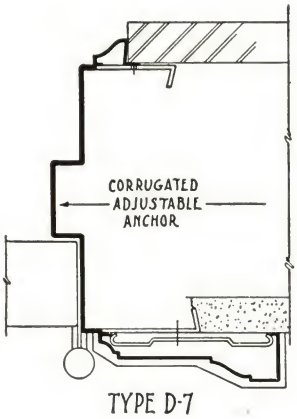

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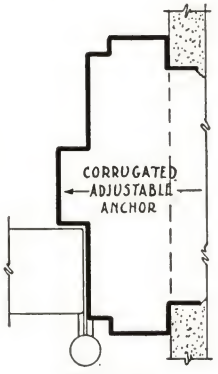

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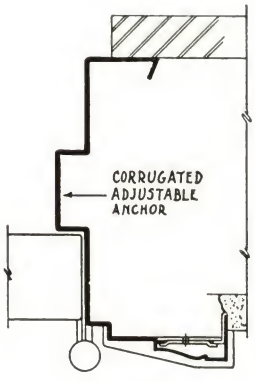

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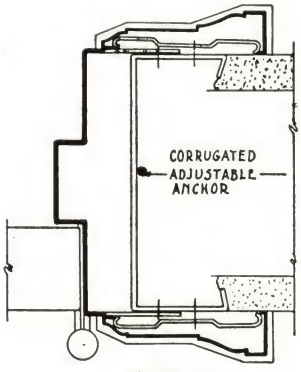

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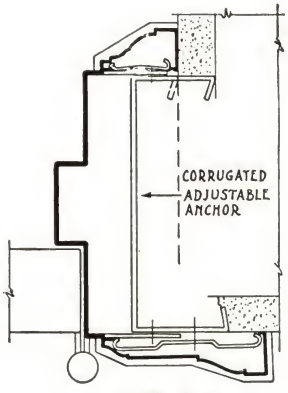

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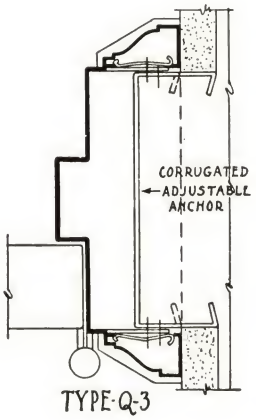

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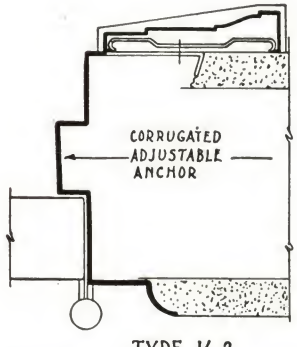

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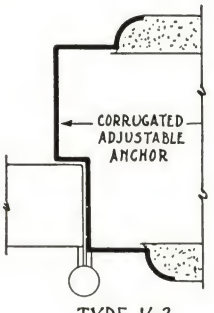

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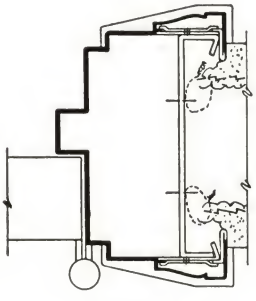
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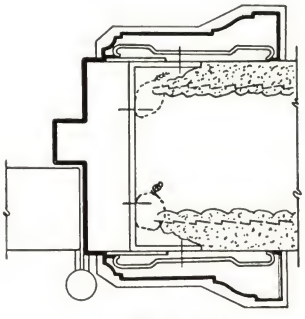
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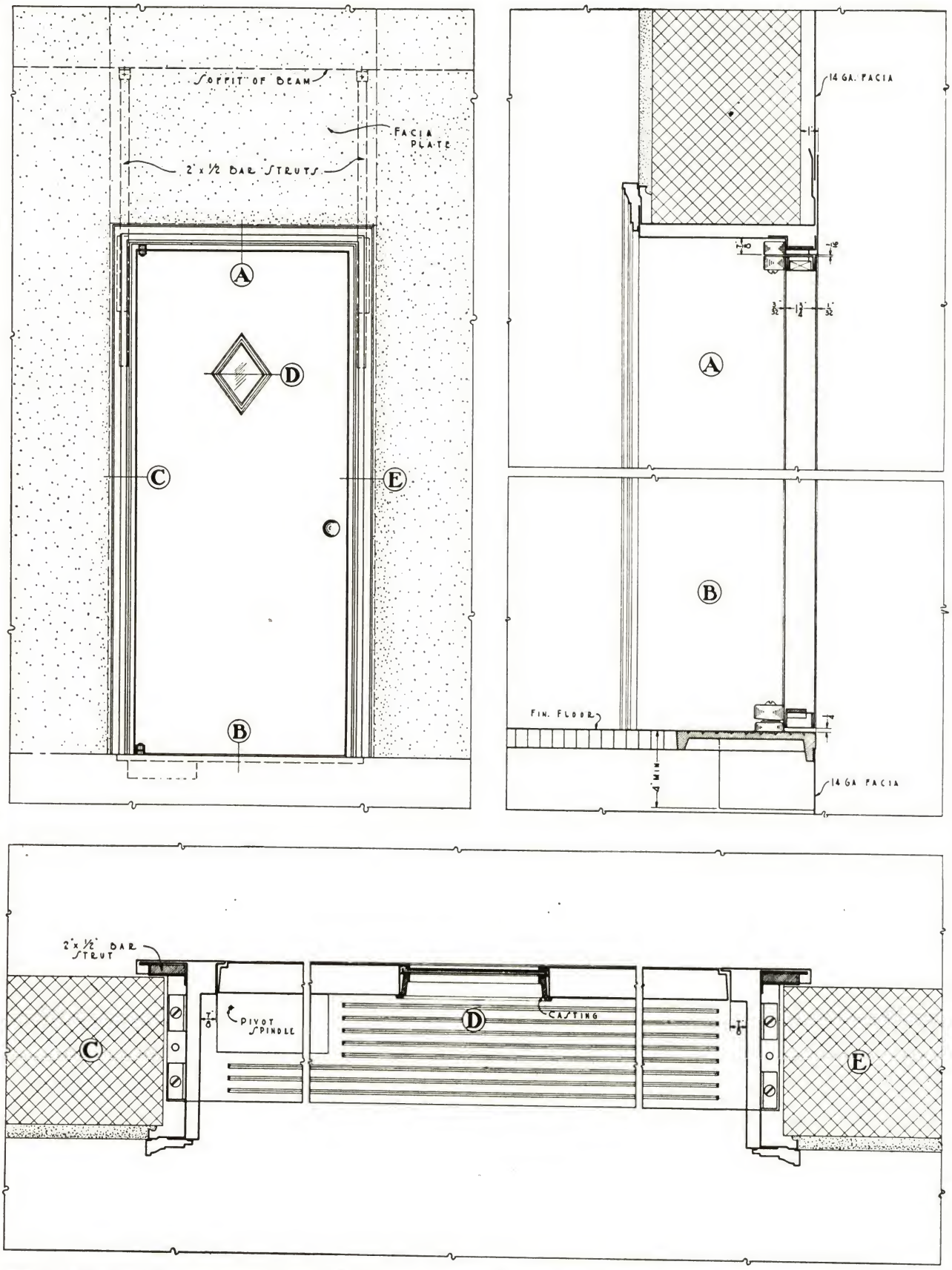
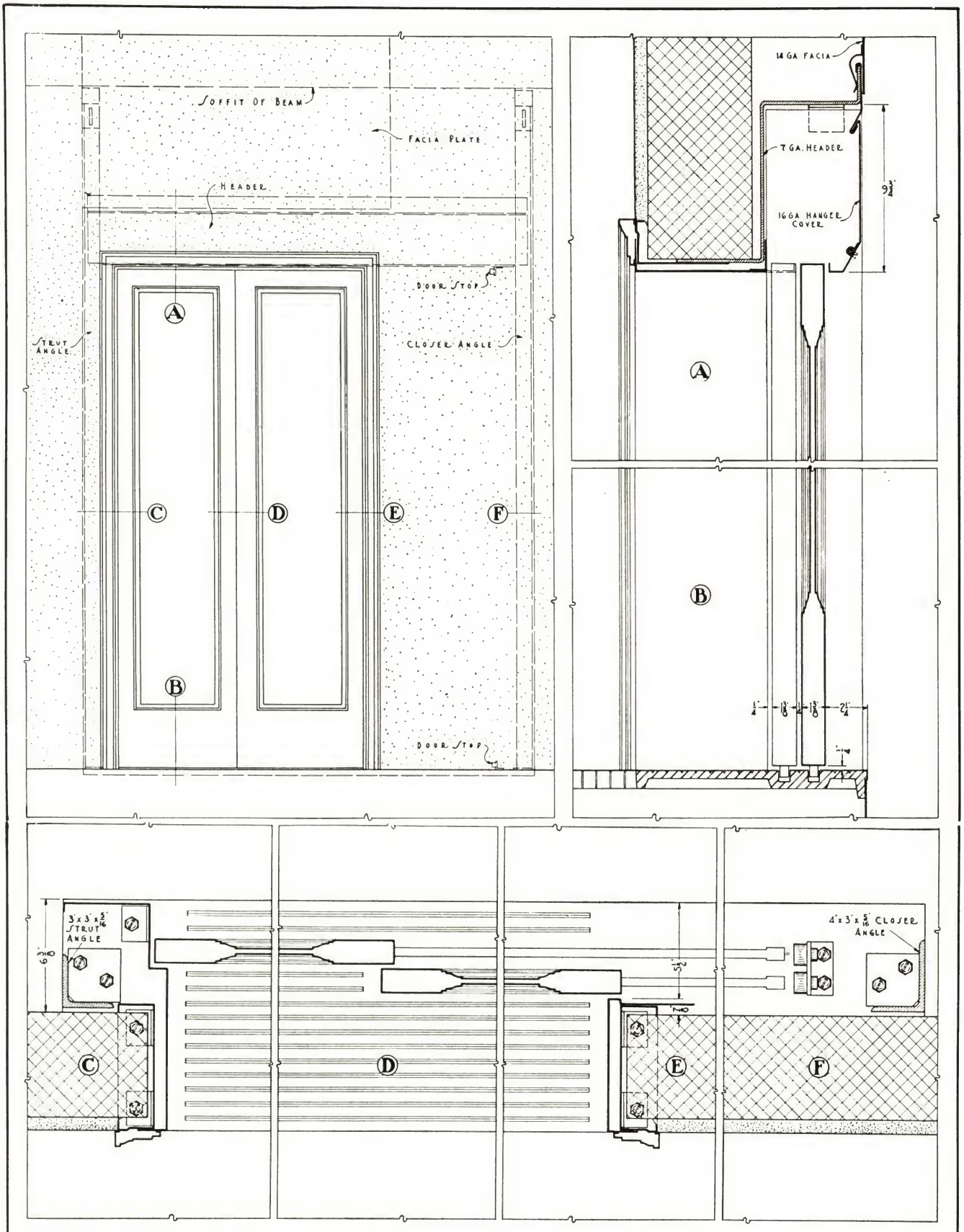
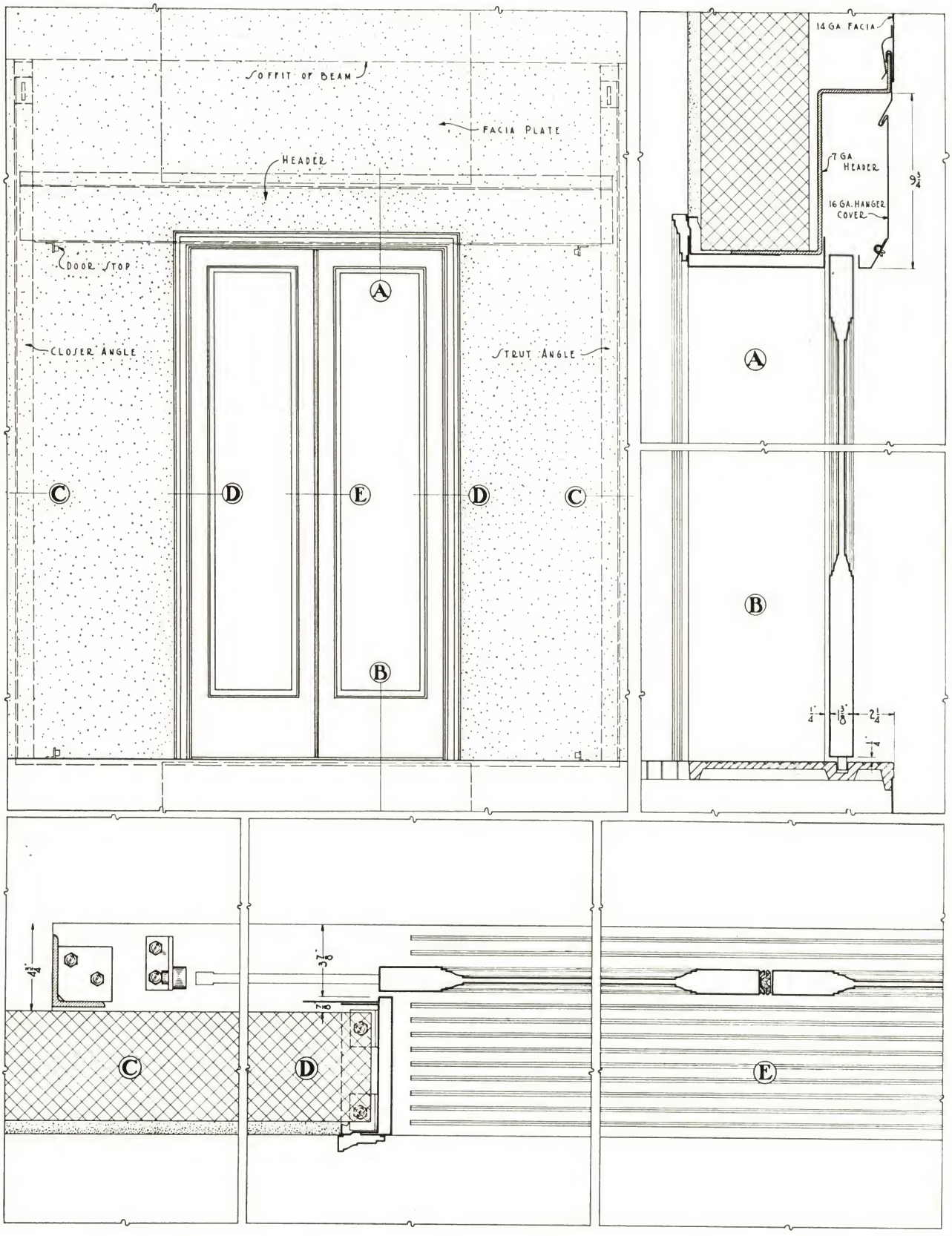
DAHLSTROM METALLIC DOOR COMPANY	TYPICAL DOOR FRAMES	PLATE NO. 4



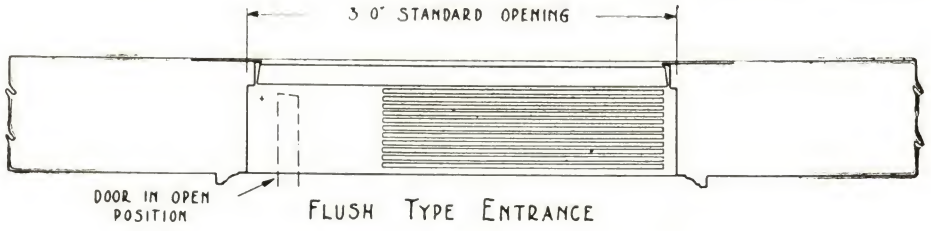
DAHLSTROM METALLIC DOOR COMPANY	STANDARD SWING ELEVATOR ENTRANCE UNIT	PLATE NO. 5



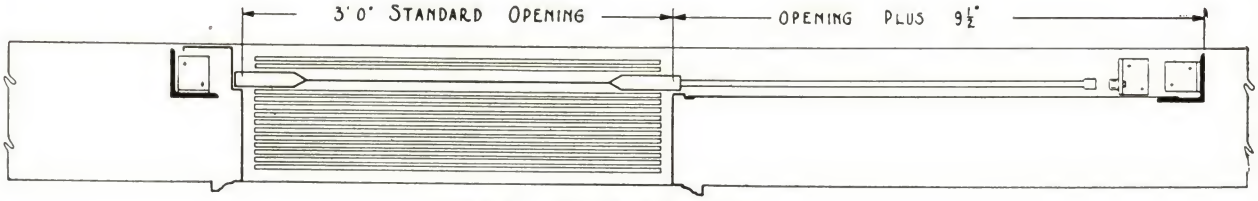
DAHLSTROM METALLIC DOOR COMPANY	**TWO-SPEED SLIDING ELEVATOR ENTRANCE UNIT** CABINET JAMBS and ROUGH BUCKS	PLATE NO. 6



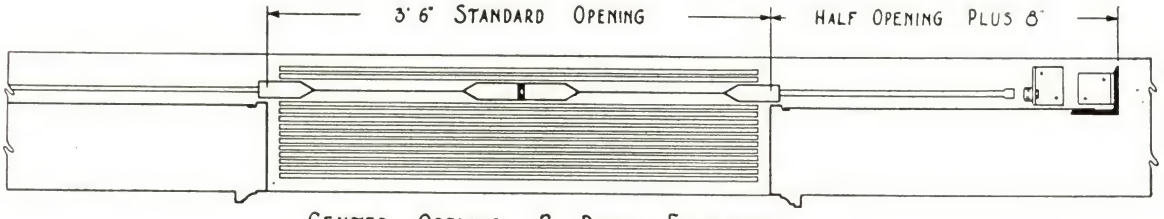
DAHLSTROM METALLIC DOOR COMPANY	CENTER OPENING ELEVATOR ENTRANCE UNIT with CABINET JAMBS and ROUGH BUCKS	PLATE NO. 7



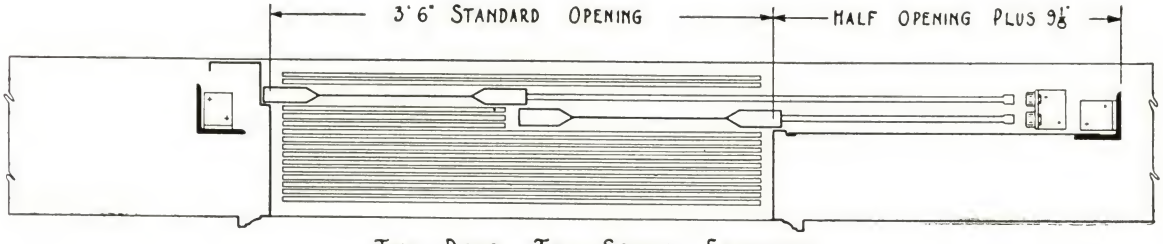
FLUSH TYPE ENTRANCE



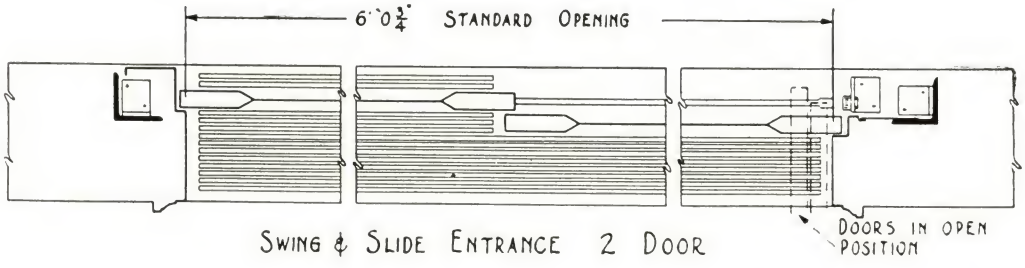
SINGLE SLIDE ENTRANCE



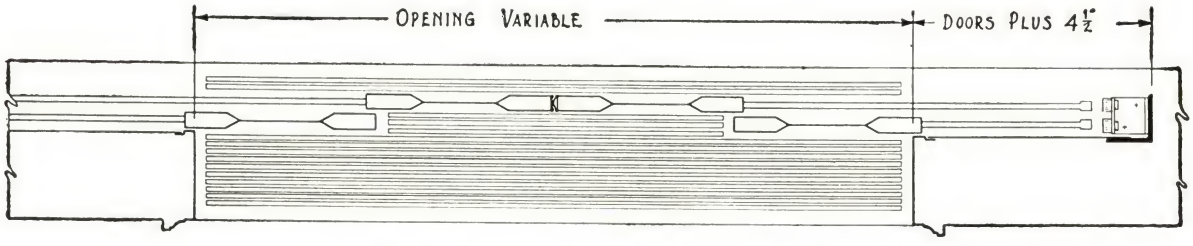
CENTER OPENING 2 DOOR ENTRANCE



TWO-DOOR TWO-SPEED ENTRANCE



SWING & SLIDE ENTRANCE 2 DOOR



FOUR DOOR CENTER OPENING TWO SPEED ENTRANCE

DAHLSTROM METALLIC DOOR COMPANY	ELEVATOR ENTRANCE TYPES	PLATE NO. 8

EQUIPMENT & SUPPLY COMPANY, INC.

Adjustable Steel Paneldor

51 Madison Avenue
NEW YORK, N. Y.

Products

ADJUSTABLE STEEL PANELDOR for Room Ventilation in Hospitals, Schools, Apartments, State Rooms, Compartments and Public Buildings. (Patent pending.)

For "Jantzen" Towel Stands and Cabinets, see Manufacturers' Index.

Description

A door construction with independently adjustable upper and lower panels to provide openings for ventilation while the door proper remains unopened.

Panel housing cavities, in line with openings, are located in the intermediate portion of the door frame. Panels are guided in operation and when closed cover openings firmly and with solid door appearance.

Concealed automatic door closer eliminates the possibility of door slamming.

Perfect Ventilation Without Draught—The adjustable feature allows the opening of either panel from 1 to 16⅝ in.

Eliminates Transom—Leaving upper panel of Adjustable Paneldor open acts as a transom, with the added feature it can be adjusted to any opening desired up to 16⅝ in.

Sneakproof—Inside mechanism holds either panel in rigid position at any size opening. Panels are automatically locked in the position desired and cannot be forced down.

Visibility—When panels are open full depth of opening, it is possible to see people passing through the corridors, yet the center of the door between panel openings acts as a screen.

Protection Against Insects—Copper screens snugly fit in recess frame completely covering opening at top and bottom of door when panels are opened.

Finishes—Grained to match any wood or any of several plain finishes. Only special steel furniture stock used, thus eliminating the refinishing for several years. All finishes are baked-on enamel rubbed to an egg-shell gloss with pumice stone and oil.

Unaffected by Climate—Adjustable Steel Paneldor are not affected by any variance in climate. They always work, no swelling, binding or cracking and are impervious to any weather conditions.

To the Architect

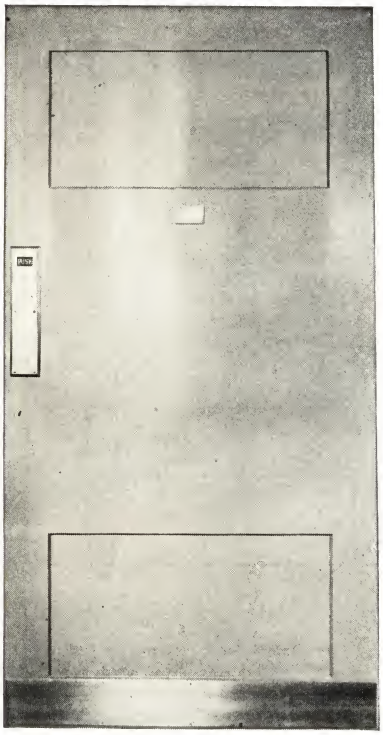
The adjustable Steel Paneldor is so designed as to leave our factory complete, ready for erection. All mechanism is concealed in the door proper, eliminating all cutting in the field for door checks and closers. To your clients it will be a great stride in modern practical door equipment.

Inspection and Detail Drawings

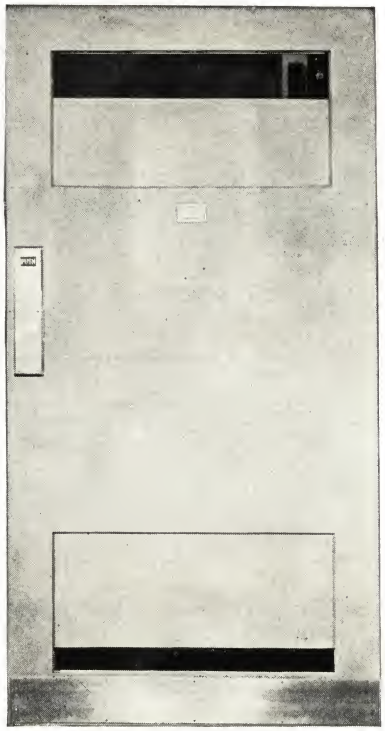
We solicit a personal call for your inspection and comments

Display Suite, 2509-51 Madison Avenue, New York, N. Y.

We will be pleased to consult with you, furnishing detail drawings and estimates for your consideration.



Adjustable Flush Door Panel in Closed Position



Adjustable Flush Door Panels in Partly Open Position

Showing Position of Panel Operating Handles (Door Closer Concealed)

THE KAWNEER COMPANY

Rustless Metal Doors

GENERAL OFFICES
NILES, MICHIGAN

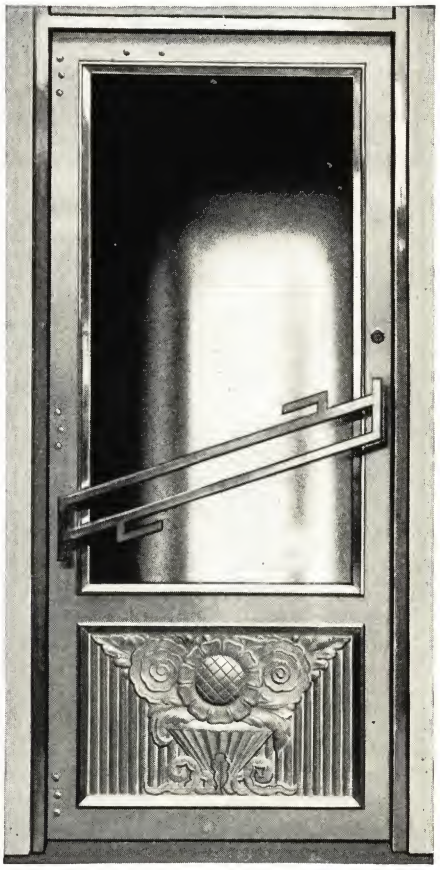
FACTORIES

CHICAGO, ILLINOIS — BERKELEY, CALIFORNIA — NILES, MICHIGAN — CHICAGO HEIGHTS, ILLINOIS

FOR FULL INFORMATION, SEE COMPLETE KAWNEER CATALOGUE IN MANUFACTURERS' INDEX

Above:
107th Infantry Armory,
New York City

Left:
Wm. Wrigley Jr. Co.,
Chicago, Illinois



Helfrichs, Ashland, Kentucky

METAL DOORS BUILT TO COMPLY WITH THE ARCHITECT'S SPECIFICATIONS

Custom-built doors of non-ferrous metals are built by Kawneer craftsmen to comply with any design furnished by the architect.

Cast metal embellishments, kick plates, push plates, push bars, etc., are also handled with the same skill that has typified the work of this company for over twenty-six years.

A complete description of Kawneer doors is contained in our complete catalogue. See Manufacturers' Index.

THE
Kawneer
COMPANY
Niles, Michigan
RUSTLESS METAL
Store Fronts, Windows, Doors,
Architectural Cast Metals

JAMESTOWN METAL DESK COMPANY, INC.

Metal Doors–Partitions and Interior Trim—Steel Office Furniture Filing Equipment

JAMESTOWN, N. Y.

SALES OFFICES

BALTIMORE, MD., Wm. E. Gambrill Co., 213 East Street
BOSTON, MASS., Jamestown Metal Desk Co., Chamber of Commerce Building
BUFFALO, N. Y., Shults Engineering Co., Morgan Building
CHICAGO, ILL., Coleman Fireproof Door Co., 3727 No. Western Avenue
CINCINNATI, OHIO, J. K. Nickerson Co., 1011 First National Bank Building
CLEVELAND, OHIO, Walters Seidel Co., 2341 Carnegie Avenue
DALLAS, TEX., Pinkston Mason Co., 710 Construction Building
DETROIT, MICH., A. F. Saunders, 802 Owen Building
NEW HAVEN, CONN., A. R. Kirschner Co., 30 Whitney Avenue
NEW YORK, N. Y., Jamestown Metal Desk Co., 285 Madison Avenue
NEWARK, N. J., Clarence Ash, Griffith Building
PHILADELPHIA, PA., Robert R. Mackay, 2006 Chestnut Street
PITTSBURGH, PA., Norman C. Brown, 625 Park Building
ST. LOUIS, MO., H. C. Morrison Co., 1722 Railway Exchange Building
SCRANTON, PA., LeBar, Evan & Allen, 711 Linden Street
WASHINGTON, D. C., Lally-Rholader Co., 1756 M Street

REPRESENTATIVES IN MOST PRINCIPAL CITIES

GENERAL SPECIFICATIONAL DATA FOR HOLLOW METAL DOORS

Stiles and rails are formed from a single sheet of 18-gauge steel. All joints and miters are made a continuous weld with acetylene gas process. Panel mouldings electric welded to the stiles and rails, insuring perfect alignment and rigidity. Cork insulation strips are inserted in the stiles and rails to deaden the metallic ring of hollow metal. Panels are insulated with ¼-in. thick asbestos.

Frames—Reinforcing plates are placed inside, backing up all hardware. Drilling and tapping for hardware is done at factory. Combination bucks and jambs are made of 18, 16, 14 or 12-gauge steel as required together with sufficient masonry anchors. Corners are mitered and gas welded.

Trim—Made of 18-gauge cold rolled steel.

Mitered corners are gas welded. Trim is secured with concealed fasteners or with special oval head screws.

Finish—All finished products are thoroughly cleaned, primed and filled, followed by required coats to produce durable finish of color desired. Each coat uniformly applied, baked and sanded, with final coat rubbed as required.

Classification of Finishes—A list of standard classification of finishes is given in the following schedule. The purpose of this list is to show the price brackets in which the various finishes occur.

Class A—All plain enamels except white and black.

Class B—Color stipples, straight grain mahogany, walnut, birch, white enamel and black.

Class C—Oak, crotch mahogany, pine, circassian walnut, gumwood, metal stipples and flat metal finishes.

Class D—Fumed oak, silver oak, hand stipples, black walnut and ebony black.

TYPICAL JONESTEEL INSTALLATIONS

Boston, Mass.
West End Telephone Building
Public Service Building

Buffalo, N. Y.
Buffalo City Hall
Rand Building
New York Central Station
State Office Building, Buffalo, N. Y.
State Office Building, Albany, N. Y.

Cincinnati, Ohio
Cincinnati Bell Telephone Co. Building
Christ Hospital

Cleveland, Ohio
Higbee Co. Store

Dallas, Tex.
Dallas Gas Co.
Dallas Power & Light Co.

Detroit, Mich.
Newcomb Endicott Store
Keifer Hospital

Hartford, Conn.
Hartford Telephone Building

New Orleans, La.
Medical Center Building, Louisiana State University

New York, N. Y.
Irving Trust Co. Building at 1 Wall Street
Western Union Building
Walker-Lispenard Telephone Building
New York Hospital

Newark, N. J.
American Insurance Building
National Newark and Essex Bank Building
Essex County Isolation Hospital

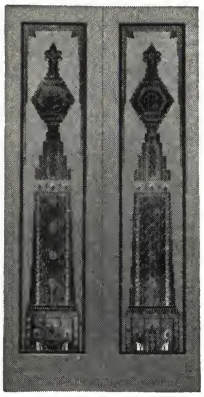
Philadelphia, Pa.
Convention Hall
Camden City Hall
Philadelphia General Hospital

Pittsburgh, Pa.
Gulf Refining Co. Building
Allegheny General Hospital
Federal Reserve Bank

St. Louis, Mo.
South Western Bell Telephone Building
Famous Barr Department Store

A

B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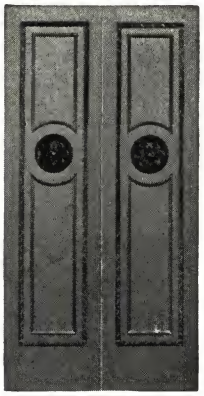
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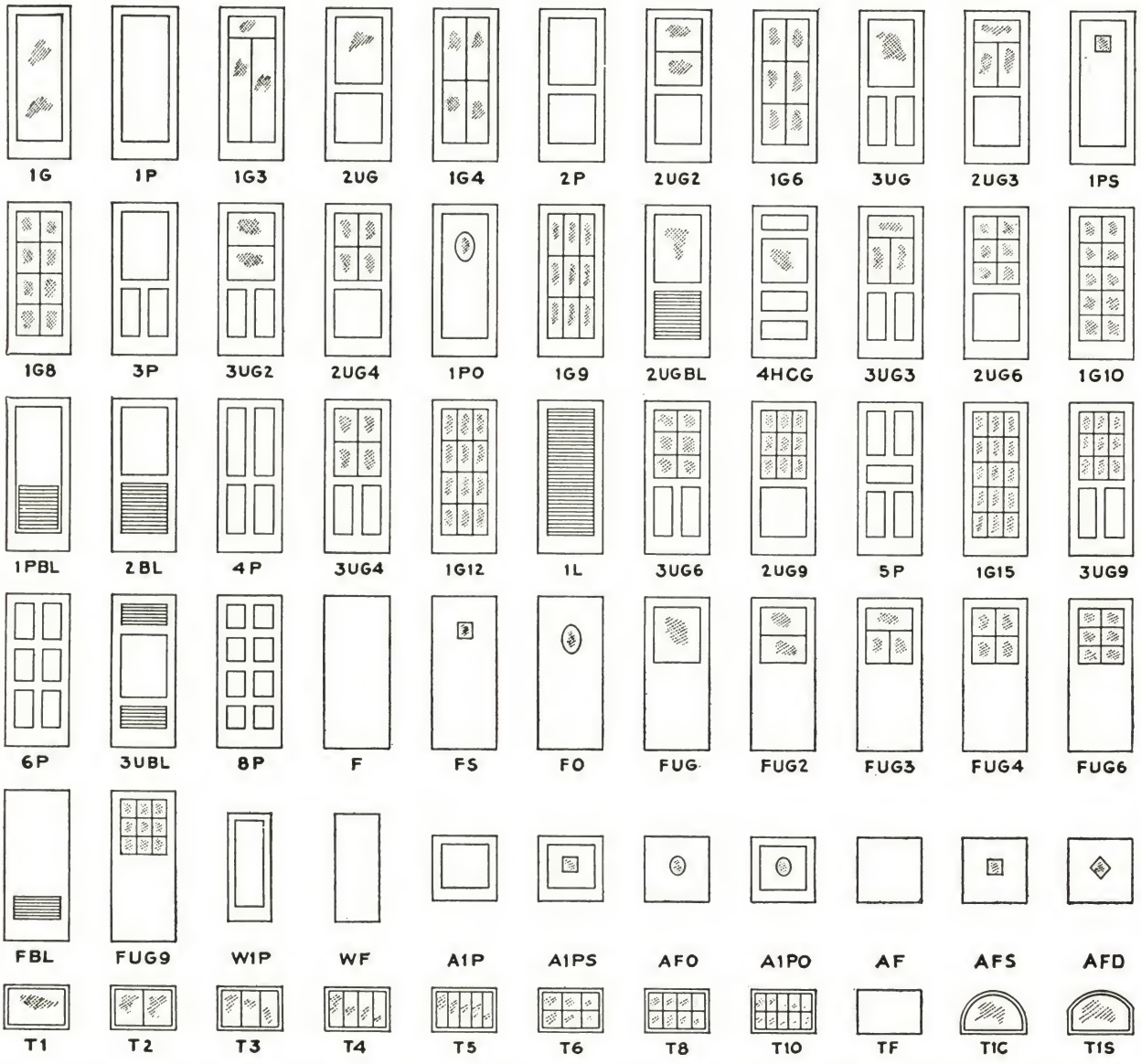
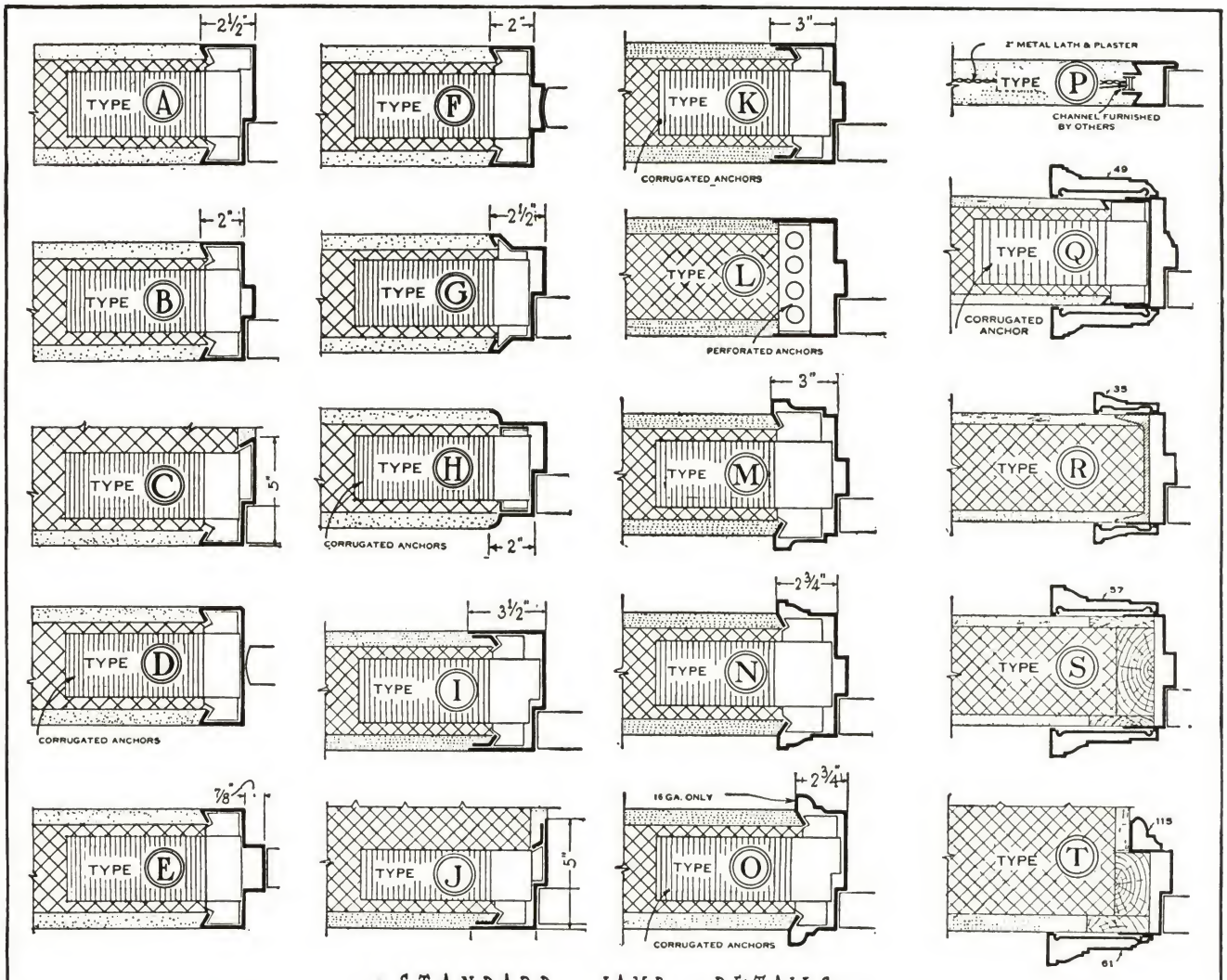
SUGGESTED DESIGNS FOR ELEVATOR DOORS



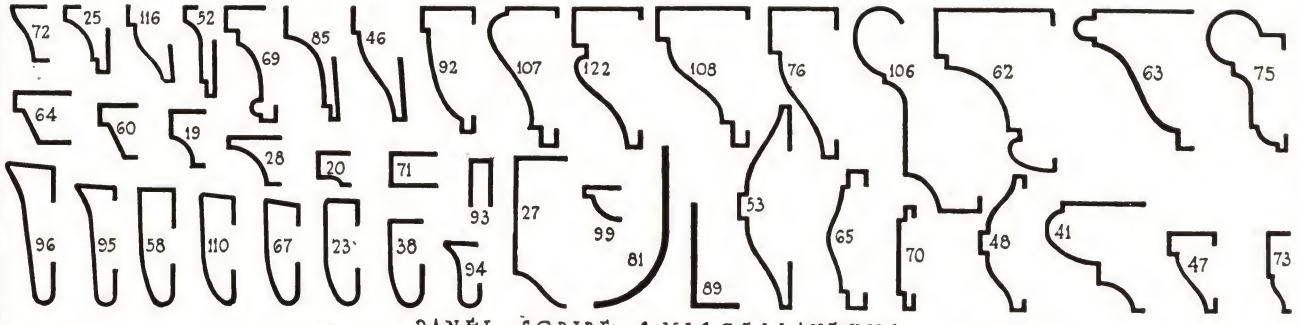
JAMESTOWN METAL DESK COMPANY

STANDARD DESIGNS OF DOORS AND SASH

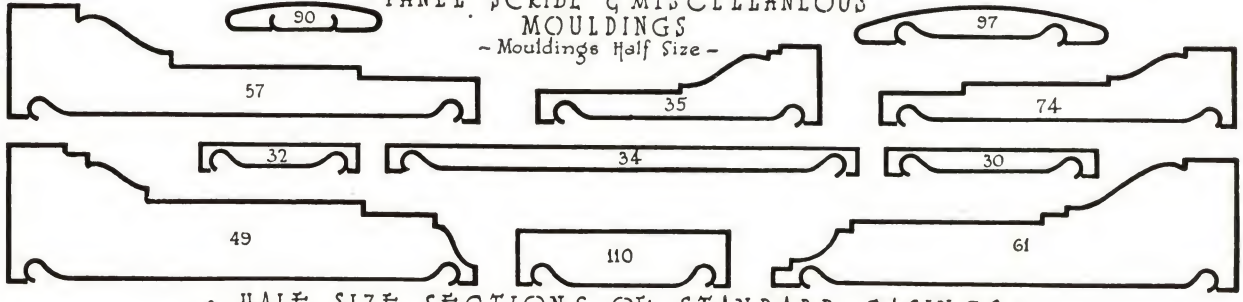
JoneSteel TRADE MARK



• STANDARD JAMB DETAILS •



PANEL SCRIBE & MISCELLANEOUS MOULDINGS
~ Mouldings Half Size ~



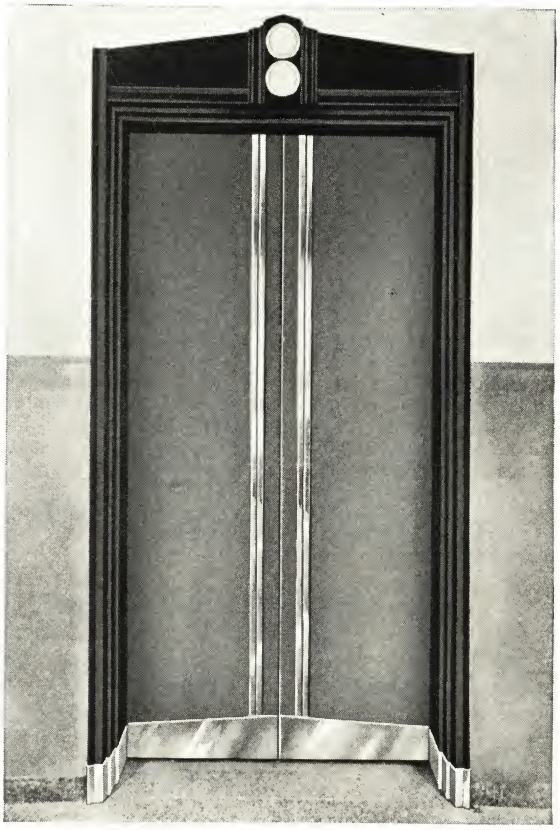
• HALF SIZE SECTIONS OF STANDARD CASINGS •

JAMESTOWN METAL DESK COMPANY

DETAILS OF HOLLOW METAL DOORS & TRIM

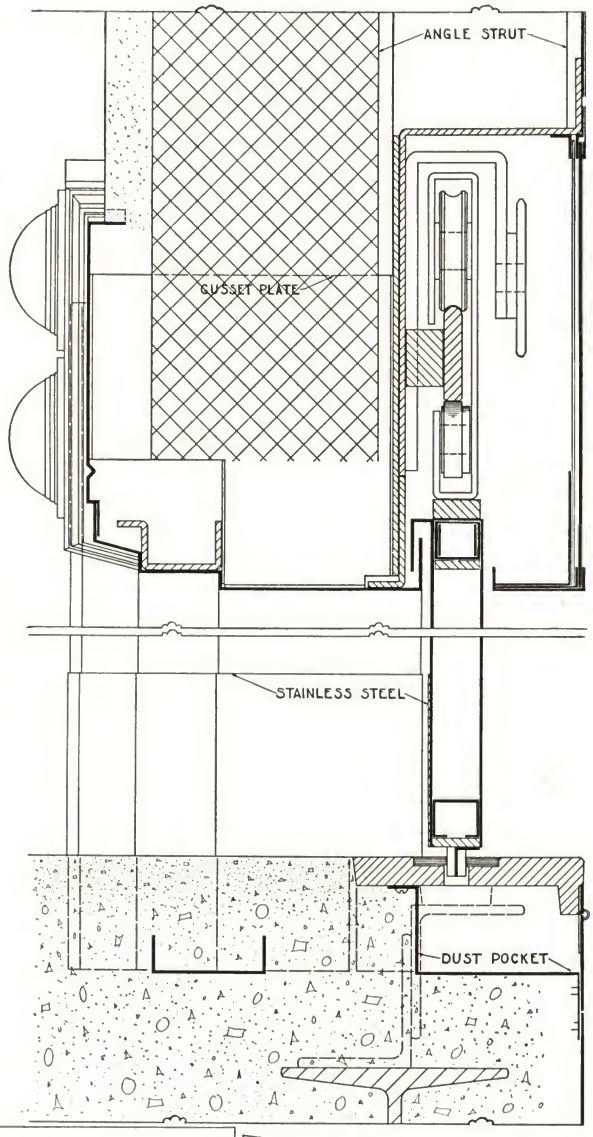
Jones Steel

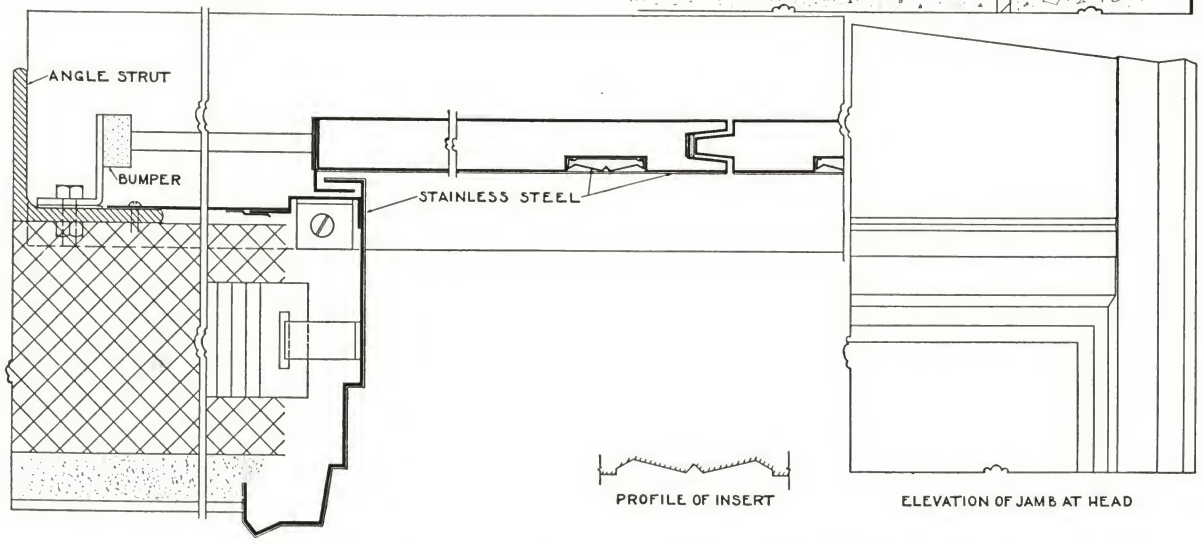
DRAWING- 3



Typical Elevator Unit
Irving Trust Company Building
New York, N. Y.

Illustration shows construction of labeled Elevator Units with Stainless Steel Inserts, Kick Plates, and Plinths





JAMESTOWN METAL DESK COMPANY

DETAILS OF HOLLOW METAL DOORS & TRIM

Jones Steel — DRAWING- 2

ESTABLISHED 1909

LAWTON-STEPHENS CO., INC.

Hollow Metal Doors, Drawn Metal Mouldings

427 Marcy Avenue, BROOKLYN, N. Y.

SALES AGENTS

ALBANY, N. Y., James Ackroyd & Sons, 964 Broadway
BRIDGEPORT, CONN., K & K Company, 739 Boston Avenue
CHARLOTTE, N. C., Edwin C. Boyette, Jr.
DENVER, COLO., Geo. P. Heinz Co., 812 Twelfth St.
HOUSTON, TEX., Walcott & Maisey, 330 West Bldg.
JERSEY CITY, N. J., Atlas Building Products Co., 3010 Hudson Blvd.
PHILADELPHIA, PA., Kratz Hardware Co., Perry Building
SAN FRANCISCO, CAL., Gates Tetterson Co., 557 Market St.
SCRANTON, PA., Geo. F. Becker, 517 Lackawanna Ave.

Products

HOLLOW METAL DOORS and TRIM.
COMBINATION BUCK, JAMB and TRIM.
COMPLETE ELEVATOR ENCLOSURES.
DRAWN METAL MOULDINGS.

Lawton-Stephens Service

We illustrate herewith a few examples of modern hollow metal doors designed and executed in our plant. They serve to show the high degree of artistic development possible in our treatment. Doors of distinction in hollow metal are an accomplished fact, and we are ready and eager to co-operate with the architect in carrying out his ideas for any particular design, character or effect he may desire.

Lawton-Stephens' facilities for making complete installations of hollow metal doors, our diversified experience in this type of work and our highly trained personnel assure the maximum satisfaction to both architect and builder.

Specifications for Standard Hollow Metal Doors

All doors to be of size and design as shown on door schedule and drawings, of LAWTON-STEPHENS CO., INC. manufacture, constructed throughout of open hearth, cold rolled, patent leveled furniture steel. They shall be 1¾ in. thick, 5-in. stiles and rails, except bottom rail which shall be 10 ins. in height, and be welded at all points of intersection. Stiles and rails to be of No. 18-gauge steel, with suitable asbestos or cork filler; panels to comprise two sheets of No. 18-gauge steel with suitable asbestos or other filler, or to be a single sheet of No. 12-gauge patent leveled furniture steel, and mouldings to be cold drawn of No. 20-gauge steel. Mouldings to be interlocked with and into these stiles and rails and, where doors are glazed, to be provided with loose steel stops arranged to receive the glass.

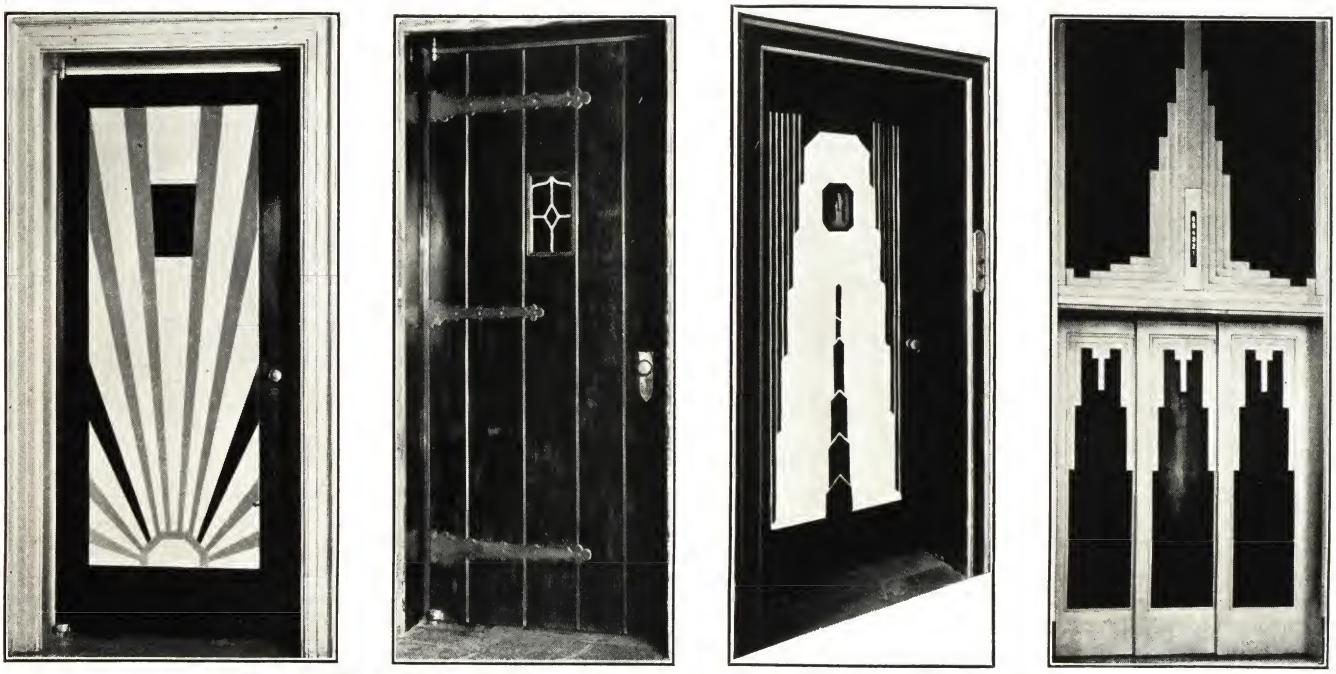
Note: If Underwriters' doors are required, they should be so specified—in which event, stiles and rails are lined with asbestos with Z-bar or other suitable spreader.

Lawton-Stephens Elevator Enclosures

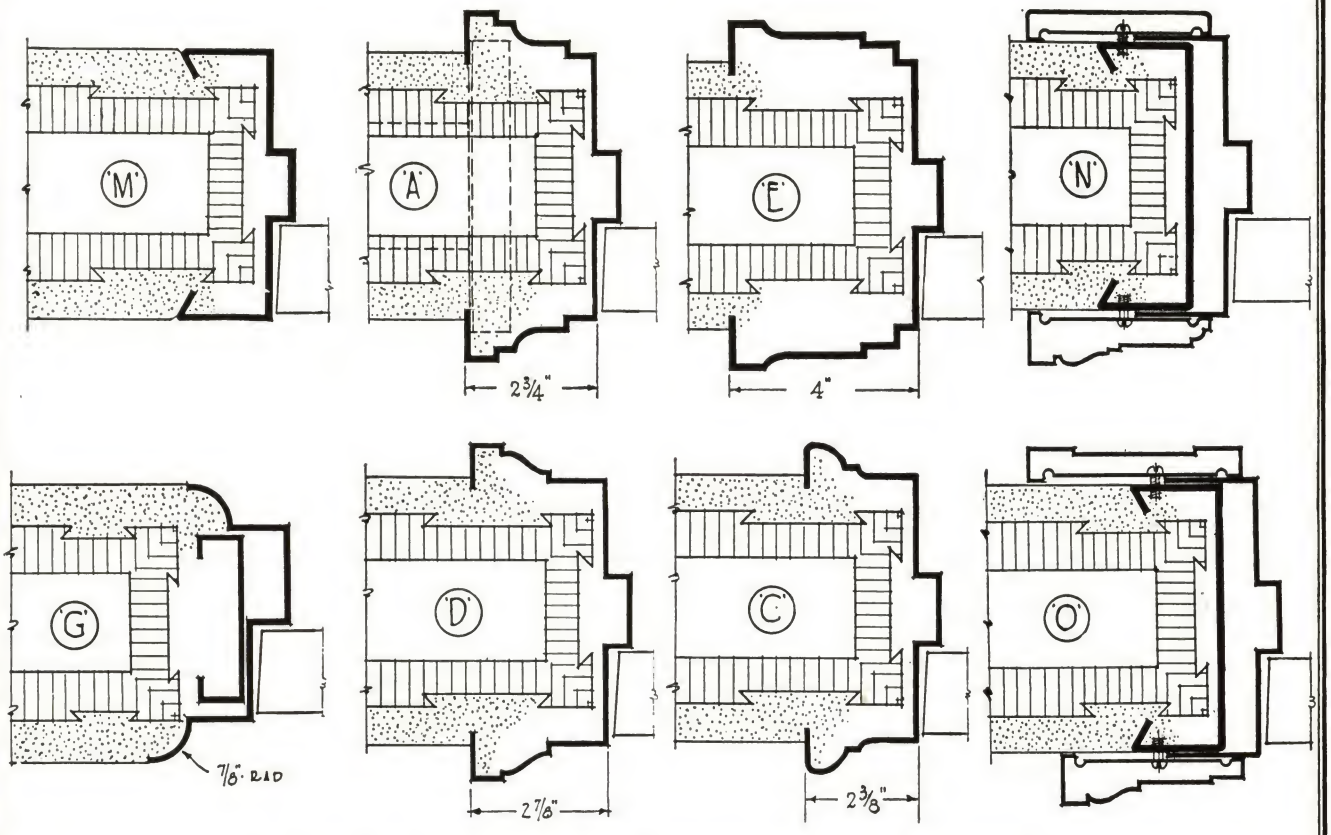
The LAWTON-STEPHENS CO., INC., is a pioneer in this field of endeavor and has completed extensive installations where the full responsibility for the elevator enclosure has been entrusted to the door manufacturer. The entire opening, including doors, bucks, jamb, sill, glass, glazing and hardware is installed as one contract, thereby doing away with divided responsibility and faulty operation.

Particular attention has been given to push button installations for apartment houses and this company has developed a special standard installation for this type of enclosure.

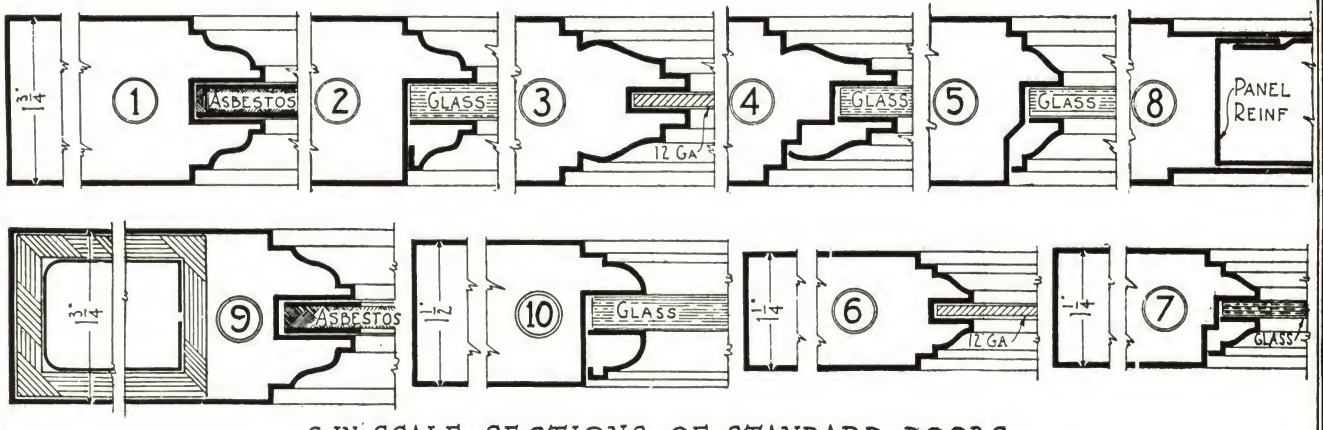
LAWTON-STEPHENS CO., INC., will be pleased to forward to architects and builders complete data, including specification, photographs and sketches, on request.



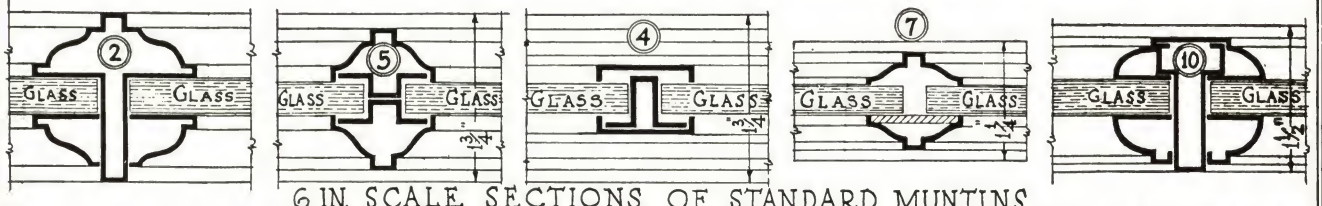
Types of Old English and Modernistic Doors as Manufactured by the Lawton-Stephens Co.



3 IN. SCALE DETAILS OF STANDARD DOOR FRAMES



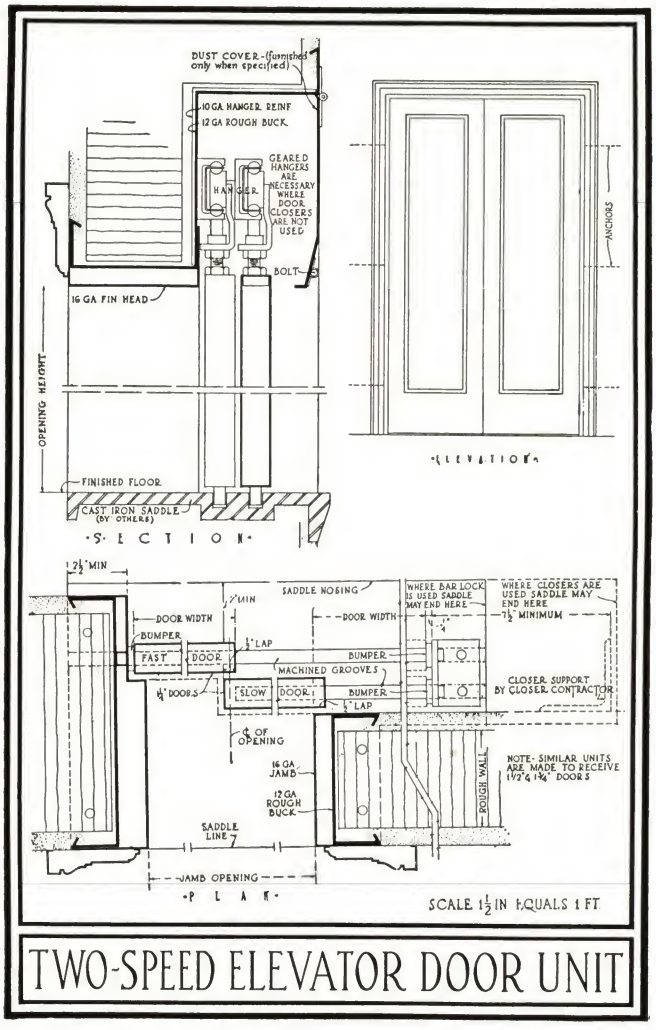
6 IN SCALE SECTIONS OF STANDARD DOORS



6 IN. SCALE SECTIONS OF STANDARD MUNTINS

NOTE~ Doors No. 1, 2, 3, 4 & 5 are Standard 1¾" doors. Doors No. 6 & 7 are Standard 1¼" thick doors. Door No. 8 - 1¼", 1½" or 1¾" thick and Door No. 10 - 1½" thick are Standard Hospital Doors. Door No. 9 is Standard Fire Underw. Door 1¾" thick with 20 ga. steel shell and asbestos lining in stiles, rails and panels. Door No. 1 has asbestos lined panels. Doors No. 3 and 6 have No. 12 ga. solid steel panels. Doors No. 2, 4, 5, 7 and 10 are arranged for glazing. Door No. 4 is also made to receive asbestos lined panel. Door No. 8 has 1/8" sinkage metal panels. All doors except No. 9 have cork fillers in stiles and rails. Full size Details mailed on request.

LAWTON-STEPHENS CO., INC.	DETAILS OF HOLLOW METAL DOORS AND TRIM	DRAWING NO. 1 SCALE 3" & 6" EQUALS 1'-0"



TWO-SPEED ELEVATOR DOOR UNIT

Special Hospital Type Door Construction

Lawton-Stephens Hospital Doors were specially developed for this service. They are semi-flush, carrying all the characteristics and sanitary features of the flush door but eliminate the usual flat monotonous appearance. Finish is a high class baked or grained enamel, the life of which is about 25 years.

Jambs

Jambs may be No. 12, 14, or 16 gauge integral combination buck, jamb and trim, or No. 18 gauge cabinet jambs installed with rough steel bucks. With cabinet jamb installation, trim is separate, either clipped on or screwed on, and both jamb and trim can be finished to match the door.

Finish

All surfaces are thoroughly cleaned of all grease and foreign matter before finish is applied. Each coat is then applied and baked.

This Company has an enviable reputation for the quality and durability of its finish and is prepared to furnish a large variety of enamels in plain colors, grained to match wood, or metallic finishes of various shades such as bronze, copper, verd antique or any other finish desired.

Where a prime coat finish is specified, the final coat is applied at the building by the painting contractor.

Mouldings

This Company specializes in drawn metal mouldings, made from either stock dies, or to special detail.

Our service includes a complete machineshop, to make either new dies or to keep old dies in first class condition. A large number of dies are in stock, including such shapes as panel mouldings, trim, automobile mouldings, channels, angles, and special shapes of many kinds. These may be specified in either hot or cold rolled strip steel, galvanized steel, bronze, copper, monel metal or various other metals, as desired.

Other Products

This company manufactures various types of pressed or stamped metal shapes for a large number of different purposes.

List of Representative Installations

Memorial Buildings

Horace Bushnell Memorial Hall, Hartford, Conn., Helmle, Corbett & Harrison, Architects; R. F. Jones & Company, Builders

Sterling Memorial Library, Yale University, New Haven, Conn., James Gamble Rogers, Architect; Marc Eidlitz & Son, Builders

Office Buildings

Architects Building, 101 Park Avenue, New York, N. Y., Ewing & Allen, Architects; Post & McCord, Builders

Williamsburgh Savings Bank, Brooklyn, N. Y., Halsey, McCormack & Helmer, Architects; William Kennedy Construction Co., Builders

Washington Central Trust Building, Washington, D. C., Coolidge, Shepley, Bulfinch & Abbott, Architects; James Stewart & Co., Builders

U. G. I. Fidelity Building, Philadelphia, Pa., U. G. I. Contracting Company, Builders

Hospital Buildings

Columbia-Presbyterian Medical Center, New York, N. Y., James Gamble Rogers, Architect; Marc Eidlitz & Son, Builders

Somerset Hospital, Somerville, N. J., Crow, Lewis & Wick, Architects; John Lowry, Inc., Builders

Riverside Hospital, New York, N. Y., H. C. Pelton, Allen & Collens, Assoc. Architects; Marc Eidlitz & Son, Builders

Germantown Hospital, Philadelphia, Pa., Arthur H. Brockie, Architect; Irwin & Leighton, Builders

Medical & Pediatric Laboratory, Yale University, New Haven, H. C. Pelton, Architect; Sperry & Treat, Builders

Municipal Buildings

Brooklyn Municipal Building, Brooklyn, N. Y., McKenzie, Voorhees & Gmelin, Architects; Cauldwell-Wingate Co., Builders

South Office Building No. 2, Harrisburg, Pa., Gehron & Ross, Architects; Nelson-Pedley Construction Co., Builders

Magistrates Court House, New York, N. Y., George M. McCabe, Architect; James McWilliams, Inc., Builders

Telephone Buildings

Newark Telephone Building, Newark, N. J., Voorhees, Gmelin & Walker, Architects; Turner Construction Co., Builders

Southern New England Telephone Building, Stamford, Conn., R. W. Foote, Architect; H. Wales Lines Company, Builders

Chesapeake & Potomac Telephone Exchange, Parkersburg, W. Va., McKenzie, Voorhees & Gmelin, Architects; Engstrom & Co., Builders

New York Telephone Company, West 18th Street Exchange, New York, N. Y., Voorhees, Gmelin & Walker, Architects; Tide Water Building Co., Builders

Industrial Buildings

National Biscuit Company, New York, N. Y., Louis Wirsching, Architect; John Lowry, Inc., Builder

Ward Baking Company, Pittsburgh, Pa., C. B. Comstock, Architect; W. F. Trimble & Sons, Builders

Otis Elevator Company Building, Yonkers, N. Y., W. O. Moyer, Architect; Turner Construction Company, Builders

Educational Institutions

Yale Law Building, New Haven, Conn., James Gamble Rogers, Architect; Sperry & Treat, Builders

Brooklyn Law School, Brooklyn, N. Y., Goodhue Associates, Architects; Thos. O'Reilly & Son, Builders

Seward Park High School, New York, N. Y., Walter C. Martin, Architect; Psaty & Fuhrman, Builders

Hall of Civil Rights, Lafayette College, Easton, Pa., Warren & Wetmore, Architects; James Stewart & Company, Builders

Residences

Ogden Reed Residence, New York, N. Y., Lafayette Goldstone, Architect; G. Richard Davis, Inc., Builders

Kirkman Residence, New York, N. Y., Ernest Flagg, Architect; Downey Associates, Builders

Chauncey M. Depew Residence, New York, N. Y., James Stewart & Company, Builders

Dodge Residence, New York, N. Y., Clinton & Russell, Architects; L. M. Neckermann & Company, Builders

Clubs

Lawyers' Club, New York, N. Y., Cass Gilbert, Architect; James Stewart & Co., Builders

The Hangar Club, New York, N. Y., Cross & Cross, Architects; William Crawford, Builder

Panhellenic Institute, New York, N. Y., John Mead Howells, Architect; Hegeman-Harris Company, Builders

Foreign Installations

Bermudian Hotel, Bermuda, Warren & Wetmore, Architects; James Stewart & Co., Builders

Rio de Janeiro Tramway, Light & Power Co., Argentine, Dwight P. Robinson Company, Architects and Builders

METAL DOOR & TRIM CO.

Members of the Producers' Council

Manufacturers of "La Porte" Hollow Metal Products

LA PORTE, IND.

NEW YORK OFFICE, 205 East 42nd Street — CHICAGO OFFICE, 1458 Builders Building

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

SWING DOOR UNITS.
ELEVATOR ENCLOSURES.
DUMBWAITER ENCLOSURES.
ROLLED STEEL DOOR FRAMES.
METAL MOULDINGS.
LOUVRES, GRILLES and SILLS.

Facilities

A plant covering nearly 7 acres, designed and built for the manufacture of hollow metal materials *exclusively* for the building industry. Machinery is most modern.

Visitors are always welcome.

La Porte METAL DOORS

Materials

Materials used are the best of their respective kinds. Steel is the highest grade furniture stock of U. S. standard gauge. All work is executed by skilled mechanics. It is neat in appearance and free from defects.

Service

The plant's enormous production assures early shipment without sacrificing quality and good workmanship. La Porte is strategically located on and near important rail lines and highways, giving rapid delivery after material is shipped.

RECENT INSTALLATIONS

Los Angeles County Hospital, Los Angeles
Empire State Bldg., New York
Chrysler Bldg., New York
Cities Service Bldg., New York
Terminal Bldgs. (4), Cleveland
Lincoln Bldg., New York
Pennsylvania R. R., Philadelphia
Civic Opera House, Chicago
Daily News Bldg., New York
Travis County Courthouse, Austin, Tex.
Sterick Bldg., Memphis, Tenn.
Mountain States Tel. Bldg., Denver
Greenbrier Hotel, White Sulphur Springs, W. Va.
North Office Bldg., Harrisburg
Koppers Bldg., Pittsburgh
Grant Bldg., Pittsburgh
City-County Safety Bldg., Milwaukee
Duke University Bldgs., Durham, N. C.
New York Central Bldg., New York
Chanin Bldg., New York
State Office Bldg., Hartford, Conn.
Reynolds Tobacco Bldg., Winston-Salem, N. C.
Bus Terminal Bldg., Kansas City
University of Rochester Bldgs., Rochester, N. Y.
Fountain Square Bldg., Cincinnati
Fifth Ave. Realty Bldg., Moline, Ill.
Buffalo Courier-Express Bldg., Buffalo
DePaul Hospital, St. Louis

HOLLOW STEEL SWING DOOR UNITS

Doors and Sash (Metal Panel Type)—Panels are constructed of two 18-gauge steel plates separated by heat-retarding filler. Panel mouldings, cold drawn to profile, are fitted to panels, mitered and welded at corners, forming a continuous frame around panels.

Stiles and rails are formed of 18-gauge steel and continuously interlocked to panel mouldings. Stiles are fitted to rails, reinforced and welded at joints.

Welded-in top and bottom channels along with hardware reinforcings and compressed cork for sound deadener give unusual rigidness.

Doors and Sash (Flush Type)—Doors and sash are constructed of two 18-gauge steel plates locked to drawn steel stile members. This assembly is made very rigid by the use of interlocking stiffeners spaced not more than 6 ins. apart and extending full height of doors and sash. Welded-in top and bottom channels plus hardware reinforcings and the use of compressed cork in the voids to eliminate metallic sound produce an unusual flush construction.

Doors and Sash (Glass Panel Type)—Glass panels are held in place by removable mouldings which are screwed to stationary mould interlocked to stiles and rails. Muntins are constructed of cold drawn interlocking shapes fitted and welded to panel mouldings.

Stall Doors—Stiles and rails are formed of 20-gauge steel and continuously interlocked to 16 or 18-gauge steel panels. Stiles are fitted to rails and welded at joints.

Astragals—Astragals are of cold drawn interlocking shapes welded to door stiles.

Grilles—Grilles are of 14-gauge perforated steel secured in doors in the same manner as metal or glass panels. When grilles are desired in bottom rails they are usually formed as part of the rail.

Louvres (Stationary Type)—Louvres, constructed of specially formed 18-gauge steel members, are secured in doors in a substantial manner.

Ventadoors, Panelouvres and Servidors—Doors are prepared to receive these products which are usually furnished under separate contract. Ventadoors and Panelouvres are ordinarily delivered to our factory completely finished, and installed in the doors by us. Servidors are usually delivered direct to the building and installed in the doors by Servidor contractor.

Frames (Rough Buck and Cabinet Jamb Type)—Bucks are formed of 12 or 14-gauge steel, welded at corners, provided with anchors for securing to walls and clip angles at bottom for fastening to floor. When bucks are shipped knocked down, side members are provided with tenons for securing to heads. Jambs, formed of 16 or 18-gauge steel, are secured to steel bucks by Parker screws; to wood bucks, which are usually furnished and erected under separate contract, by wood screws.

Frames (Combination Buck and Jamb Type)—Frames are formed of 12, 14 or 16-gauge steel, mitered or coped and welded at corners. Anchors are provided for securing frames to walls and clip angles at bottom for fastening to floor.

Frames (Combination Buck, Jamb and Trim—Rolled Type)—Frames are cold rolled of 16-gauge steel. The jamb portions of side members are coped and tenoned to heads, while casing portions are mitered and acetylene welded. Frames are provided with wire anchors for securing to walls and clip angles at bottom for fastening to floor. Special anchoring arrangement is provided for frames in plaster, wood stud or Simplex partitions.

Transom Bars and Mullions (Rough Buck and Cabinet Jamb Type)—Transom bars and mullions are formed of 16 or 18-gauge steel and welded or interlocked together in the form of a tube and screwed in place to clips secured to cabinet jambs.

Transom Bars and Mullions (Combination Buck and Jamb Type)—Transom bars and mullions are formed of 12, 14, 16 or 18-gauge steel, welded to frames or secured by concealed clip angles and screws as conditions warrant.

Weatherstrips—Exterior openings are made weathertight at sides and heads by felt, rubber or spring bronze weatherstripping, and at the bottom by bronze interlocking shapes or specially formed steel strips when specified.

Casings—Casings are of 18-gauge cold drawn shapes with corners mitered, welded, and secured to frames by concealed fastenings or oval head machine screws.

Scribe Mouldings—Mouldings are cold drawn of 18-gauge steel, mitered or coped at corners, and secured to frames by oval head machine screws.

Plinths—Plinths are formed of 18-gauge steel, secured to frames by welding concealed fastenings or oval head machine screws.

Hardware and Reinforcements—Hardware must be to template and is ordinarily supplied under separate contract. All work is mortised, reinforced, drilled and tapped at the factory to receive hardware, except that frames are usually drillled and tapped for surface hardware at the building by the contractor erecting the doors. Combination type frames are provided with cover boxes in back of hardware cutouts.

Fire Underwriters' Labels—Our products have been listed by the Fire Underwriters' Laboratories for Class A, B, C, D and E situations.

HOLLOW STEEL ELEVATOR ENCLOSURES

Doors (Metal Panel Type)—Panels are constructed of two 18-gauge steel plates separated by heat-retarding filler. Panel mouldings—cold drawn to profile—are fitted to panels, mitered and welded at corners, forming a continuous frame around panels.

Stiles and rails are cold rolled of 12-gauge steel and continuously interlocked to panel mouldings. Stiles are fitted to rails and welded at joints. Stiffener channels extending full width are welded inside the doors at the bottom.

Unless otherwise specified composition guides are attached to the bottom of each sliding door. Flush bolts are used as guides when doors are combination slide and swing.

Doors (Flush Type)—Doors are constructed of two 18-gauge steel plates locked together with special interlocking members welded to plates. These members are spaced not more than 6 ins. apart and extend full height of doors. Continuous reinforcements and stiffener channels are welded inside the doors at top and bottom, and in both sides. Compressed cork is placed in doors to eliminate metallic sound.

Continuous rubber bumpers, secured in place by neat cold drawn mouldings, are provided for center-parting doors. For all other types, rubber bumpers are fastened to frames and sills.

Unless otherwise specified composition guides are attached to the bottom of each sliding door. Flush bolts are used as guides when doors are combination slide and swing.

Doors (Glass Panel Type)—Glass panels are held in place by removable mouldings which are secured to stationary mouldings with oval head machine screws. Mouldings are cold drawn to profile and are made into frames with corners mitered and welded. Stiles and rails are interlocked to stationary mouldings as described under "Metal Panel Type."

Muntins are constructed of cold drawn interlocking shapes, fitted and welded to panel mouldings.

Where mirrors occur, 18-gauge steel plates are provided for backing up.

Stationary Panels—Panels are constructed as previously described for doors, with the exception that no provisions are made for hardware or guides. Panels are secured to frames at the head and side with machine screws, and held in place at the bottom by channels fastened to sills.

Glass—Glass, which is usually furnished by us, is set in rubber inserts and putty and held in place by removable moulding frames. Mirrors are set in the same manner, with the exception that they are backed up with felt.

Hanger Housings—Hanger housings are formed of two 12-gauge steel plates spot-welded together and firmly fastened to angle supports at both ends with machine bolts and nuts.

Dierks Building, Kansas City, Mo.
A Two-speed Opening with etched Stainless Steel Panels

Angle Supports—Hanger housings are supported independent of the walls by two structural steel angles extending from sill to either steel or concrete beam overhead and securely fastened in place. One of these angles is located to act as a closer support when closers or pneumatic operators are used.

Hanger Covers—Hanger covers are formed of 16 or 18-gauge steel and attached to hanger housings by concealed method. Ready access to hangers is permitted without removing covers.

Frames (Combination Buck, Jamb and Trim Type)—Frames are formed of 16-gauge steel mitered and welded at corners. They are securely fastened to hanger housings with machine screws and to the sills with clip angles and cap screws. Where required, a suitable number of rubber bumpers are provided.

Frames (Combination Buck and Jamb Type)—Frames are formed of 12, 14 or 16-gauge steel, either mitered or coped and welded at corners. They are securely fastened to hanger housings with machine screws and to the sills with clip angles and cap screws. Where required, a suitable number of rubber bumpers is provided.

Sills—Sills are either close grain gray iron or bronze castings with non-slip surfaces, securely anchored to either structural steel or concrete. The grooves for door guides are machined. Bumper angles, secured to sills with cap screws, are provided where required.

Facias—Facias are formed of either 14 or 16-gauge steel, substantially reinforced where necessary, and securely fastened in place.

Casings—Casings are cold drawn of 18-gauge steel, mitered and welded at corners, and secured to frames by concealed fastenings or oval head machine screws.

Scribe Mouldings—Mouldings are cold drawn of 18-gauge steel either mitered or coped at corners, and secured to frames by oval head machine screws.

Plinths—Plinths are formed of 18-gauge steel and secured to frames by concealed fastenings or oval head machine screws.

Hardware and Reinforcements—Hardware must be to template and is usually included in our contract.

All work is mortised where required, reinforced, drilled and tapped at the factory to receive hardware, except that drilling and tapping for bar locks, pneumatic operators door closers, rack and pawl devices, interlocks and striker plates are done at the building.

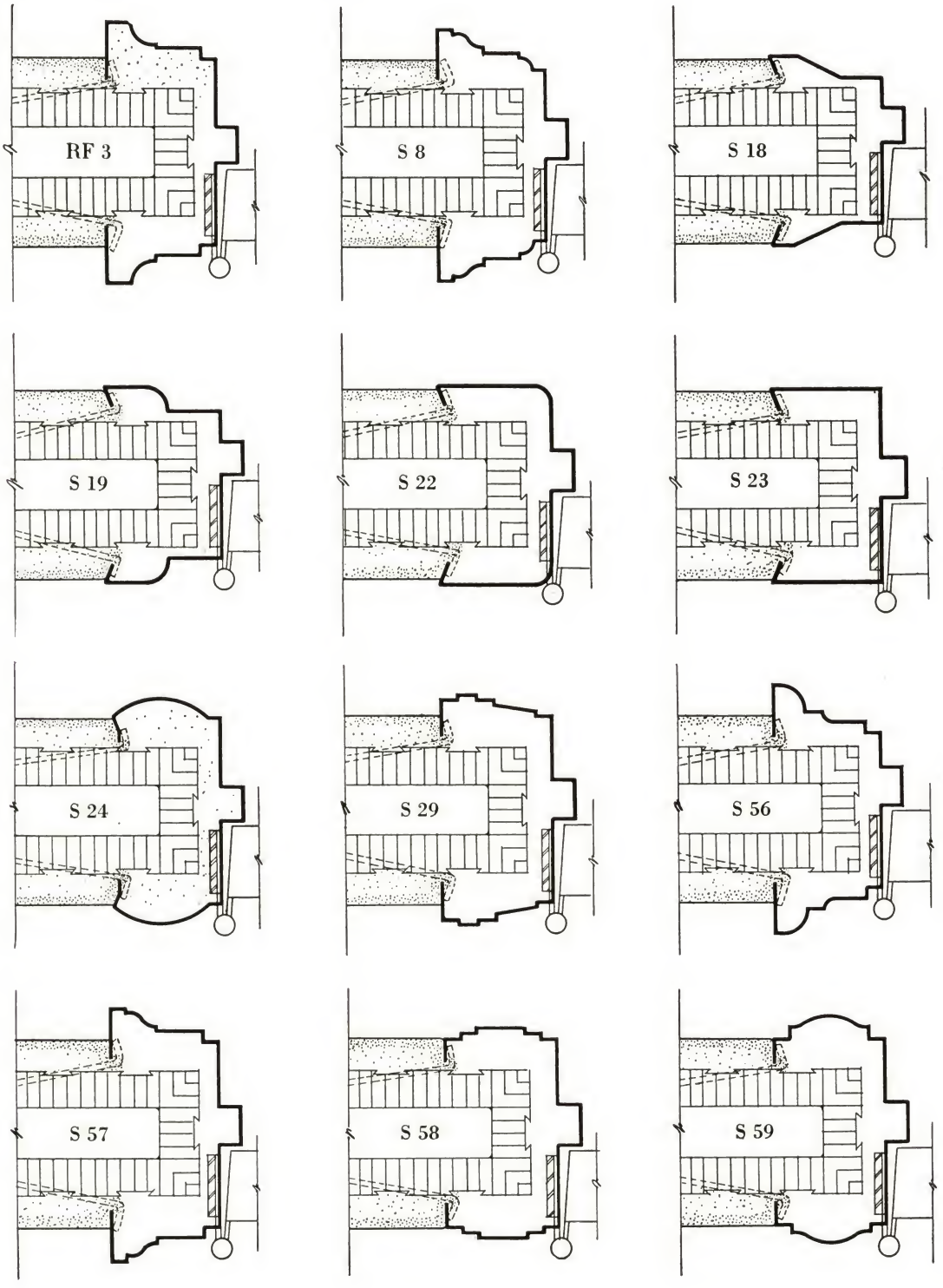
Frames for combination slide and swing type doors are provided with cover boxes in back of all hardware cutouts.

FINISH

Materials are finished in either baked prime shop coats or baked enamels (plain or grained) to meet architects' requirements.

Before painting all material is thoroughly cleaned. Doors and sash receive a dip coat of asphalt base, a rust-resisting paint. Surfaces are filled where required.

Each paint coat is baked and sanded, final coats of baked enamel being rubbed to an eggshell gloss.

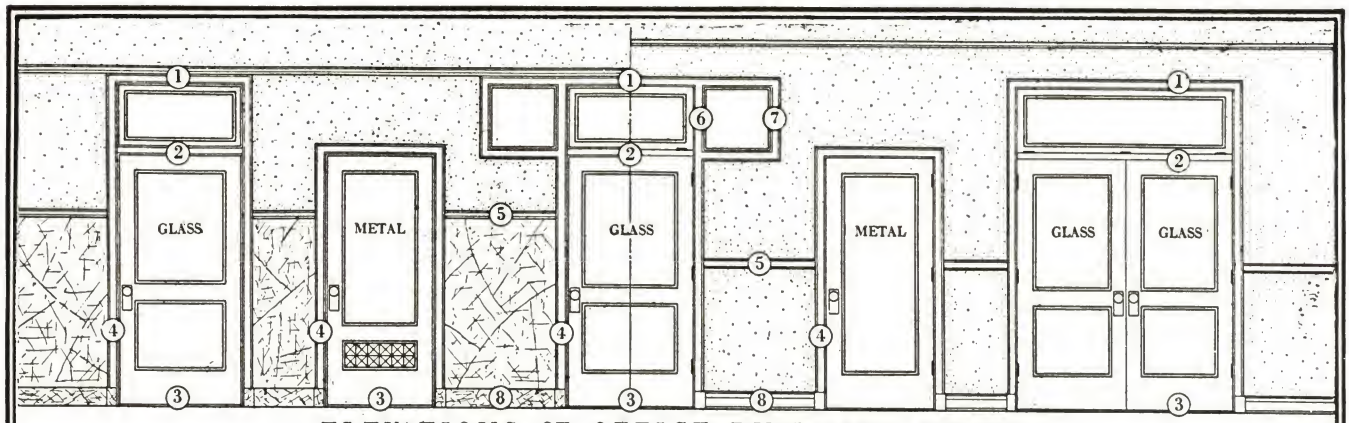


Any Arrangements Illustrated Are Adaptable to All Types

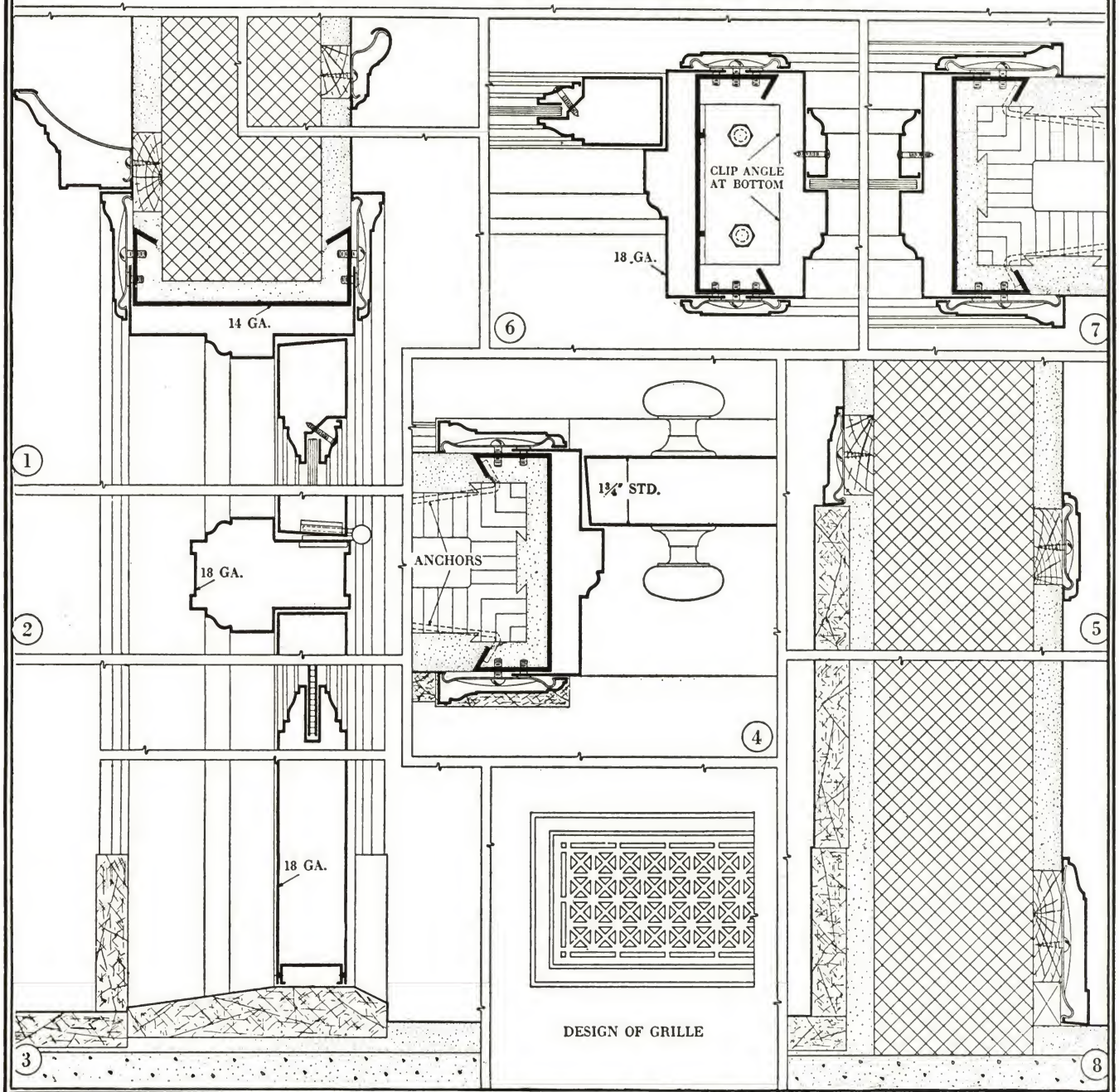
SCALE 3 IN. = 1 FT.

COMBINATION BUCK, JAMB AND TRIM FRAMES

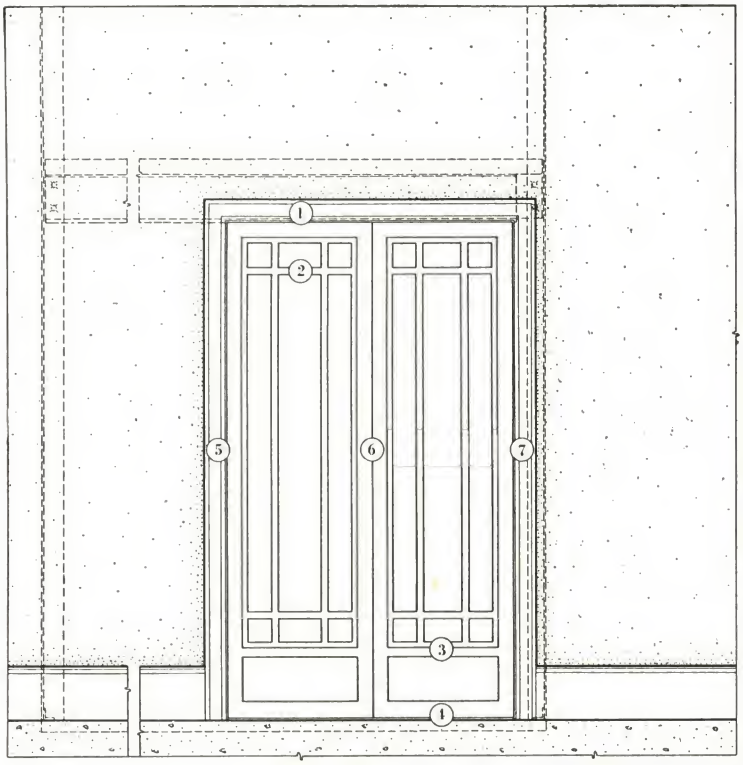
(ROLLED and FORMED TYPES)

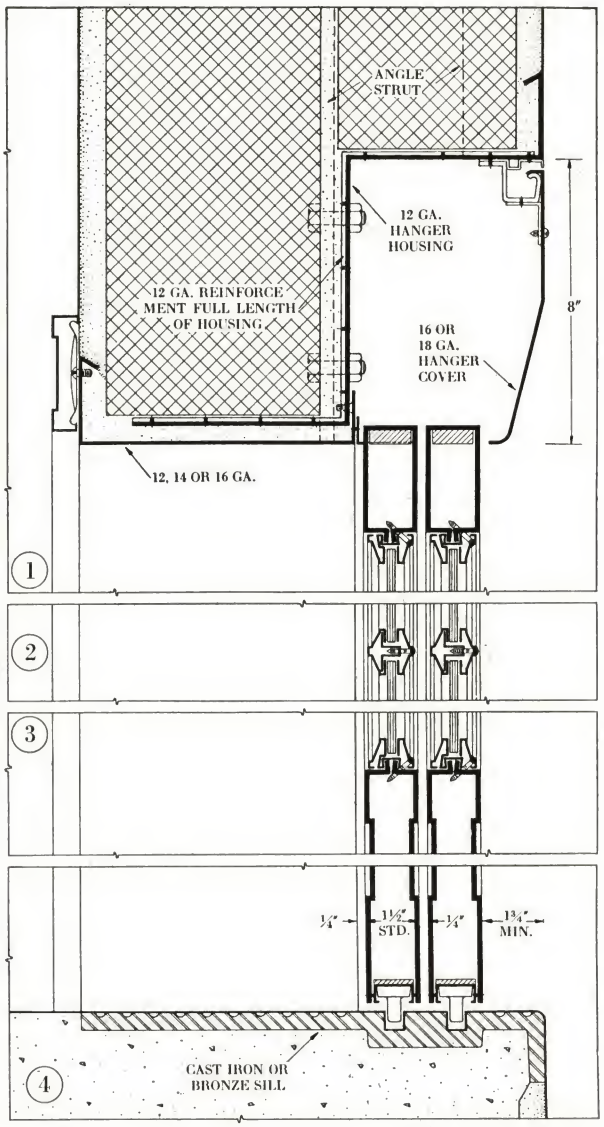


ELEVATIONS OF OFFICE BUILDING UNITS



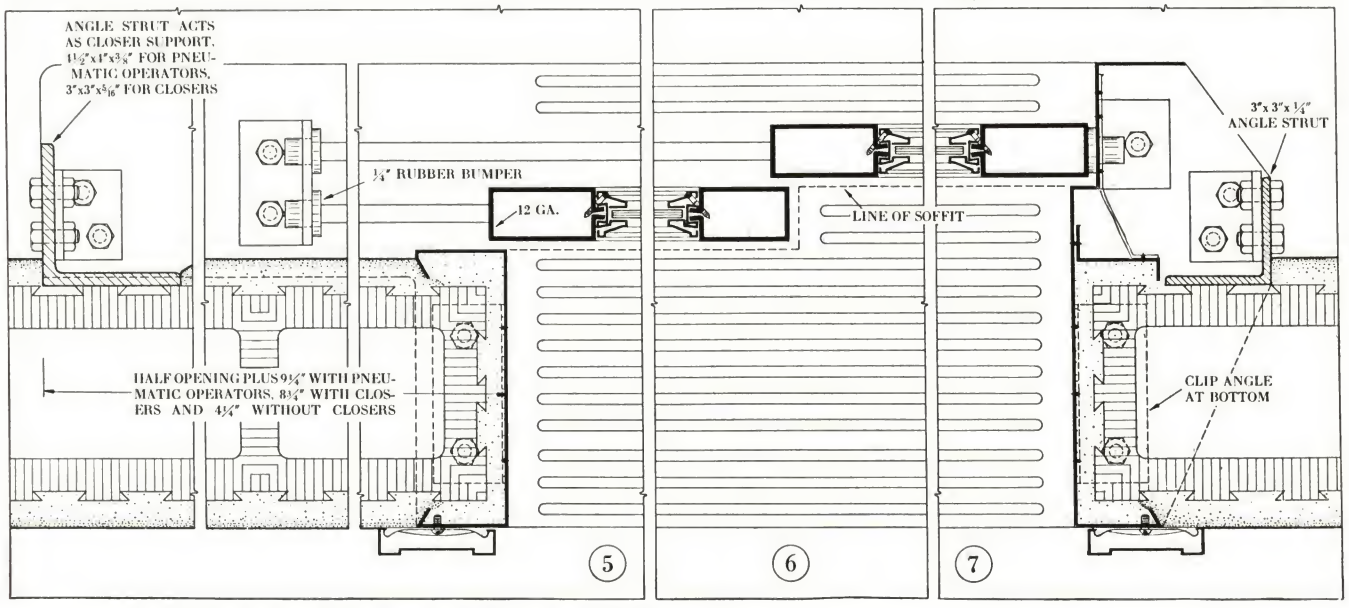
OFFICE BUILDING UNITS
(Rough Buck and Cabinet Jamb Type Frame)
SCALE 3 IN.=1 FT.





SOME makes of pneumatic operators require greater clearances than shown. Heavy duty sheave type hangers require not less than 11″ headroom. When bar locks are used, hanger covers must be made straight.

When sufficient space is not available to permit mounting the pneumatic operators or closers in back of doors as here detailed, these devices can be placed between the doors and cab



TWO-SPEED UNIT

SCALE 3/16 IN. = 1 IN.

NIEDRINGHAUS, INC.

ST. LOUIS, MO.

REPRESENTATIVES IN PRINCIPAL CITIES

Products

HOLLOW METAL DOORS and TRIM; ROLLED STEEL FRAMES; ELEVATOR ENTRANCES.

Facilities

Modern equipped plant and competent engineering department engaged in the manufacture of hollow metal.

Responsibility

Our rating in R. G. Dun's and Bradstreet's is over $1,000,000; first grade of credit.

Specifications for Niedringhaus Panel Doors and Trim

Scope of Work—Furnish the hollow metal work as shown on drawings in accordance with the standard practices of Niedringhaus, Inc., or accepted equal.

Materials—The steel used in the construction of the hollow metal shall be of the best quality commercial furniture stock free from scale, buckles and pits. For exterior work, when so specified, rust resisting metal shall be used.

The following United States standard gauges shall govern unless otherwise specified for:

Pressed Steel Bucks.....12, 14, or 16 gauge
Formed Combination Bucks and Frames .....14 or 16 gauge
Rolled Combination Bucks and Frames.....16 gauge
Cabinet Jambs less than 7 in. wide.....18 gauge
Cabinet Jambs more than 7 in. wide.....16 gauge
Trim, Rails and Stiles of doors and sash...18 gauge
Panels, Mould, Muntins, etc.....20 gauge

Doors—All doors to be of the type as shown on plans; 1¾ in. thick; stiles and rails of 18 gauge; 20 gauge steel minimum for panels; 18 gauge minimum for panels over 60 in. in height if over 28 in. wide (this conforms to the requirements of the Department of Commerce Bureau of Standards, Simplified Practice Recommendations R82-28).

Panels to be constructed of two sheets of steel with a resilient filler between making a total thickness of not less than ⅜ in. The necessary reinforcements and mortises for hardware shall be provided. Proper moulding frames shall be furnished for all glazed openings. All joints will be arc welded full length.

Cabinet Jamb Construction—***Rough Bucks***—To be provided with continuous welded corners where required.

Cabinet Jambs—Shall be properly rabbetted for doors, side lights and transoms. All corners to be coped and provided with the necessary reinforcements and mortises for hardware.

Casings—Provide cold drawn shapes as selected from stock profiles. Corners shall be neatly mitred and welded. All fastenings shall be concealed.

Combination Frames—(Alternate for Cabinet Jamb Construction.) Frames for doors, borrowed lights, etc., shall be of the unit type of manufacturers' standard profile or formed to the profile as indicated on the drawings. They shall be mortised, reinforced, drilled and tapped for all hardware, except that the drilling and tapping for door checks and transom lifters shall be done by the erector. Mitres shall be welded in their entire length and cleaned to present a smooth surface. Angle clips properly punched shall be welded to the frame for anchoring to the floor construction. Sufficient crimped anchors shall be provided to anchor each frame securely.

Transoms—Metal sash of either the stationary or hinged type shall be provided for all openings where specified. Moulding frames shall be furnished for all glazed openings.

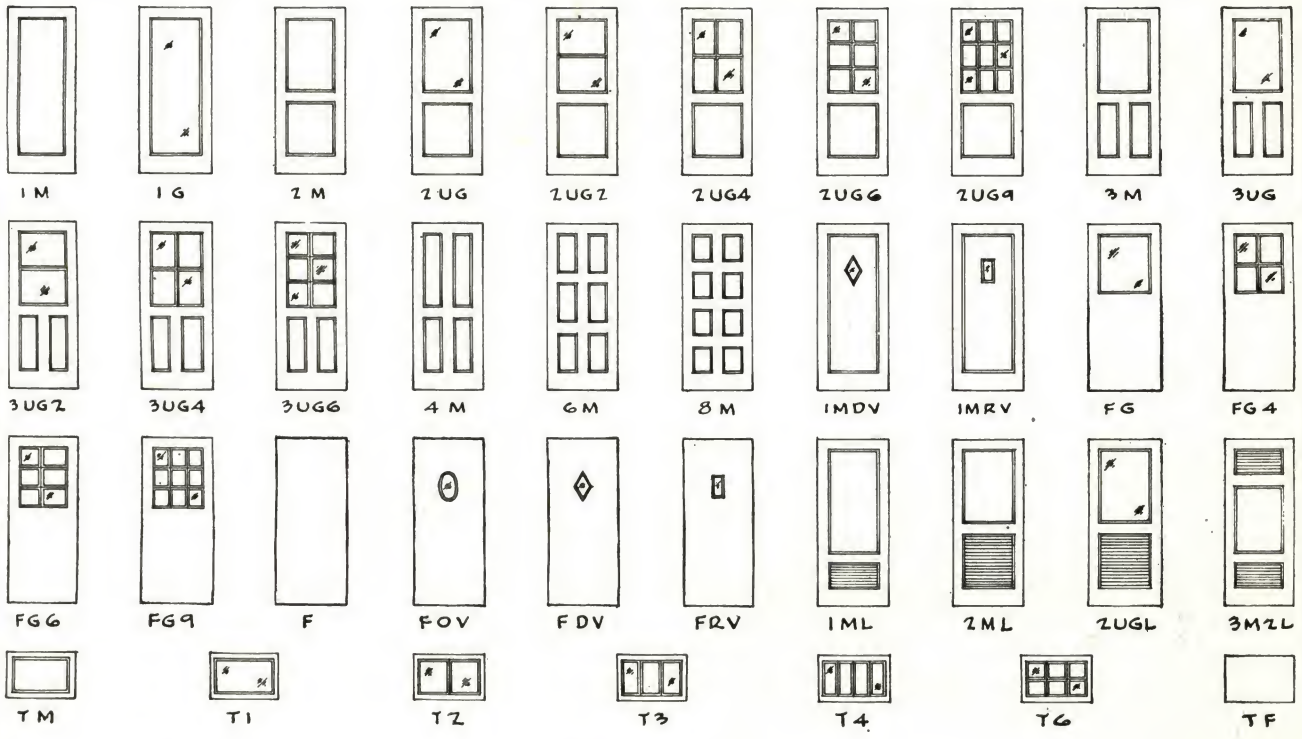
Underwriters' Labeled Doors and Frames—To be furnished where indicated.

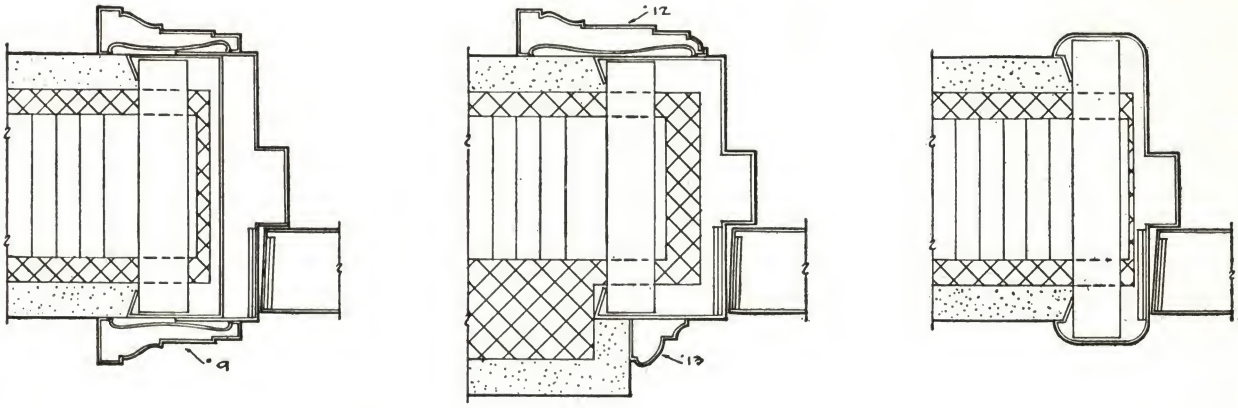
Hardware—This contractor will not furnish the hardware but will make suitable provision for it and apply at his factory such items (except numerals) which do not interfere with crating. Hardware shall be delivered prepaid to the factory of this contractor.

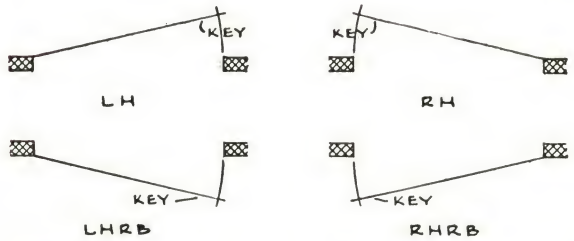
Finish—***Prime***—Materials shall be thoroughly cleaned then completely immersed in a semi-enamel primer so that the interior, as well as the exterior, surfaces are completely covered. Each coat shall be baked on separately. The final finish shall be done at the building by the painting contractor.

Baked Enamel—After priming, all materials shall be finished according to sample as selected by the architect. Two coats of varnish shall then be applied, each coat baked on separately, the final coat being rubbed to an eggshell gloss.

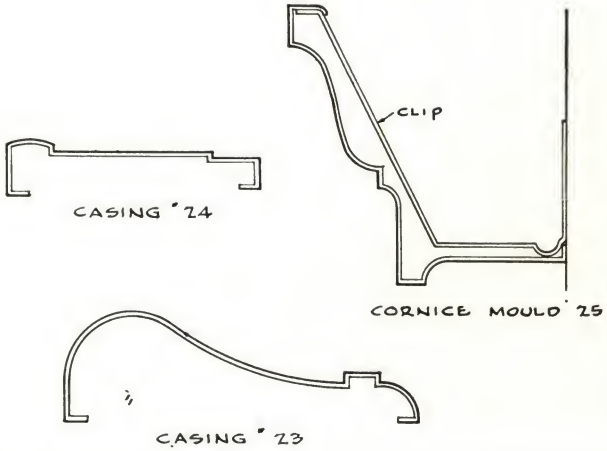
STANDARD DOOR DESIGNS AND SECTIONS



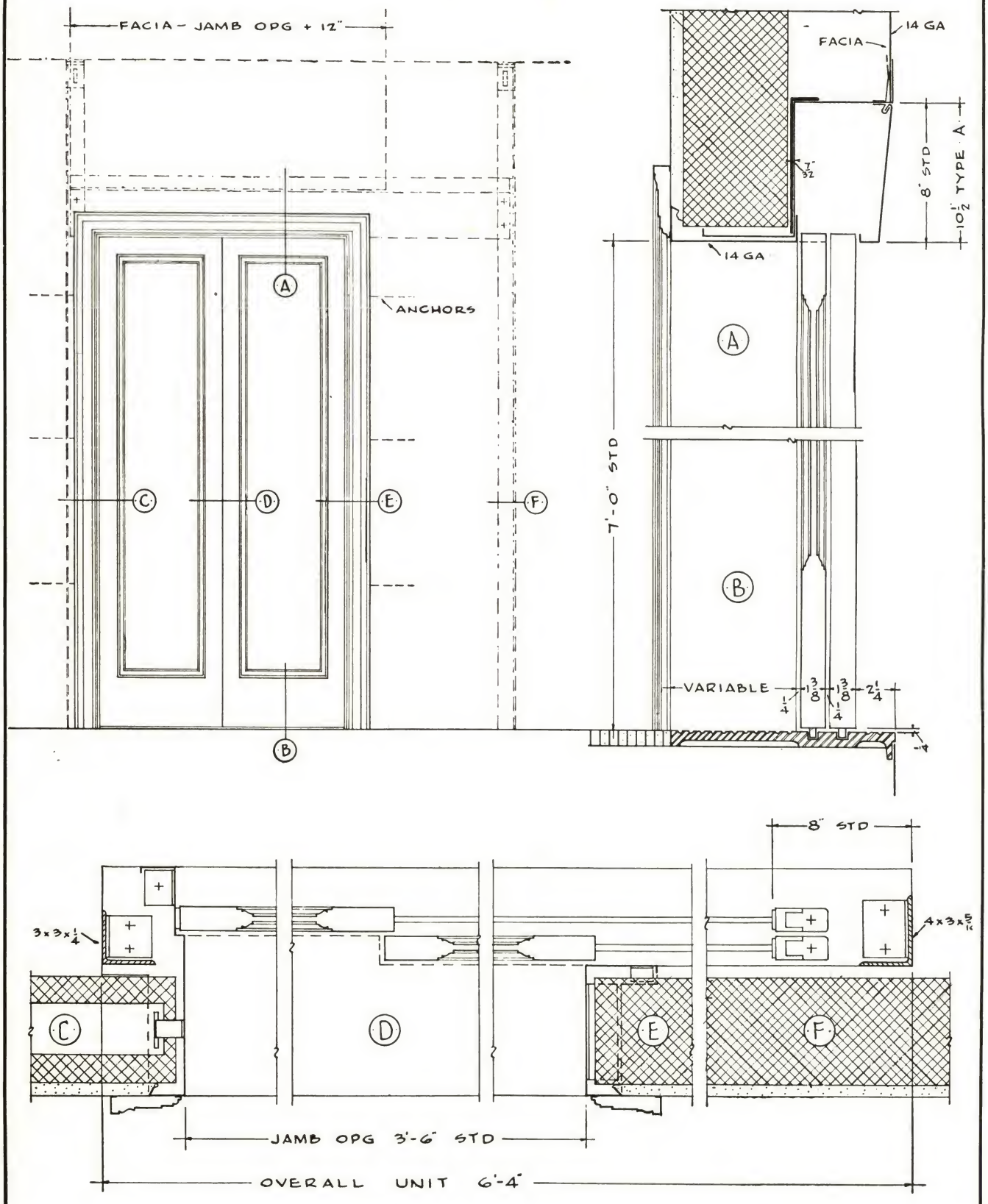




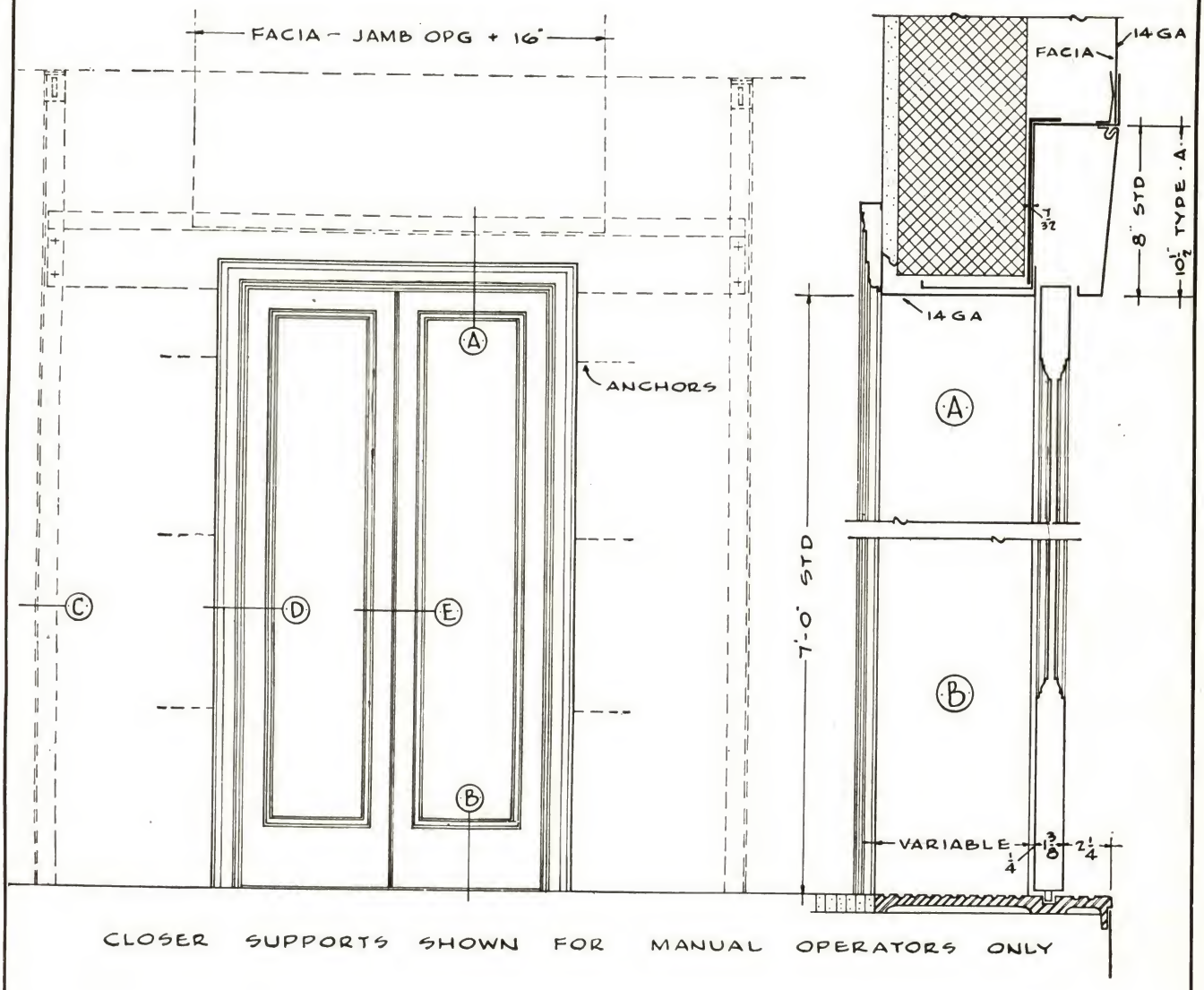
THESE DIAGRAMS ILLUSTRATE THE VARIOUS SWING DESIGNATIONS. THE APPLICATION OF THE KEY IN THEIR RESPECTIVE LOCATIONS DETERMINE THESE SWINGS. A DOOR SWINGING FROM A CORRIDOR TO ROOM IS TERMED A REGULAR SWING WITH THE KEY APPLIED TO THE STOP OR CORRIDOR SIDE. IN CASE A DOOR SWINGS FROM A ROOM TO A CORRIDOR, THE KEY IS APPLIED TO THE HINGE OR CORRIDOR SIDE OF DOOR AND IS KNOWN AS A REVERSE BEVEL SWING



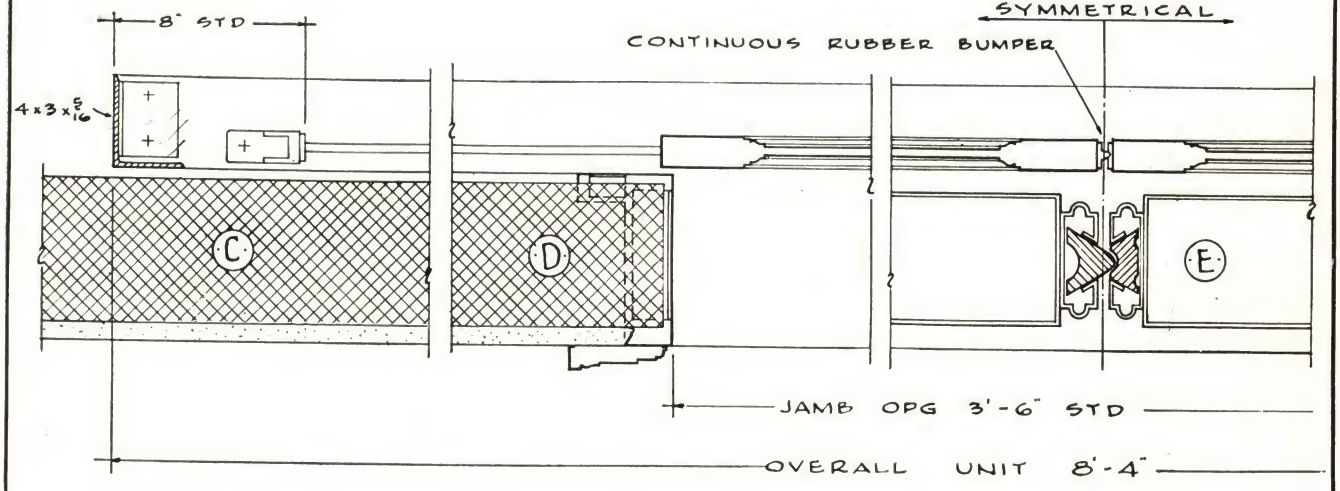
STANDARD TWO SPEED ELEVATOR ENTRANCE



STANDARD BI-PARTING ELEVATOR ENTRANCE



CLOSER SUPPORTS SHOWN FOR MANUAL OPERATORS ONLY



STEELBILT PRODUCTS CORPORATION

Hollow Metal Doors and Trim

TELEPHONE
Murray Hill 2-1624

SALES OFFICE
52 Vanderbilt Avenue
NEW YORK, N. Y.

FACTORY: CLIFTON, N. J.—Telephone, Passaic 2-3007-8-9

Products

Elevator Fronts and Cabs.

Hollow Metal and Tubular Doors, Bucks, Jambs and Trim.

Pressed and Drawn Shapes in steel, bronze, aluminum and other alloys.

Metal Specialties.

Plant

Steelbilt is housed in an absolutely modern plant of brick and steel construction, 106x310 feet, consisting of two floors of manufacturing space, totaling more than 65,000 sq. ft. The plant being of fireproof construction and 100% sprinklered, affords the kind of protection uppermost in the minds of discriminating architects and contractors.

Equipment

During the past 18 months Steelbilt has increased its production capacity more than 100%, because of substantial expenditures for modern equipment. It shall be the policy of this Corporation to continue such expenditures from time to time enabling Steelbilt to keep abreast of the trend in industry. This policy will assure Steelbilt's retention of its present enviable position in the Hollow Steel Industry.

Service

Steelbilt's entire organization is fully cognizant of the importance of the reliability and continuity of service. They believe, and properly so, that the plant and equipment represents only a small part of the value to be obtained from the use of Steelbilt Service. It shall continue to be the policy of this Corporation to be mindful of the word "Service" and all that it implies and it shall be the watchword throughout the personnel of this organization.

Approved Specification for Hollow Metal Work

All doors shall be built to conform to the Department of Commerce, Bureau of Standards, Simplified Practice Recommendations R-82-28 (effective August 1st, 1928).

Architects and engineers are urged to consult this document in preparing their specifications for Hollow Metal Doors, etc., to conform with the standards noted therein. Copies of this "Simplified Practice Recommendations" which is an approved specification for Hollow Metal Work as recommended by the Department of Commerce, Bureau of Standards, will be mailed upon request.

Steelbilt Hollow Metal Products are constructed of best quality open hearth furniture stock steel, free from all scales, buckle, pits and all other surface defects. For exterior work, approved rust-resisting metal is used. All plates for door panels shall be full cold rolled, stretcher leveled and otherwise straightened until free from perceptible waves, buckles, etc.

In the manufacture of Steelbilt Hollow Metal Products, all work is done according to best practice and quality of steel cabinet workmanship. All cutting, punching, forming, mitering and other similar work is done to hairline measurements. As this work progresses any defects that develop during the manufacturing operation are either removed or new materials placed in their stead. All work is thoroughly protected from rust during fabrication and until finished. Provision is made for proper reinforcements for all hardware and connecting work as well as for future checks on doors and frames whether or not specified.

Elevator Entrances

Steelbilt Elevator Enclosures are constructed from 12-gauge, U. S. Standard, pressed steel channel bucks extending from floor to ceiling with pressed steel lintel reinforced across the head, formed from $\frac{3}{16}$-in. steel plates for support of hanger (or integral steel frames and trim reinforced as above). $\frac{5}{16}$-in. cold rolled angle struts extending from beam to beam are standard with Steelbilt Enclosures. All frames are anchored securely to the steel in this manner, allowing for the use of either manual or power operated equipment with complete safety.

Non-slip or Ferulin type sills are standard with Steelbilt Enclosures, with machine grooves for guides. Sill seats formed from $\frac{5}{16}$-in. plates properly anchored to steel beam are also standard with Steelbilt Enclosures.

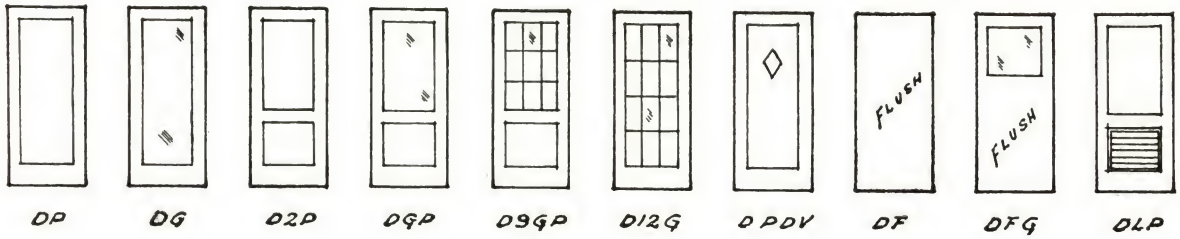
Metal fascias, made from 16-gauge, U. S. Standard, extending from the sill nosing of one opening down to the header of the opening below, adequately reinforced with steel channels providing ample rigidity, are also standard with Steelbilt Enclosures.

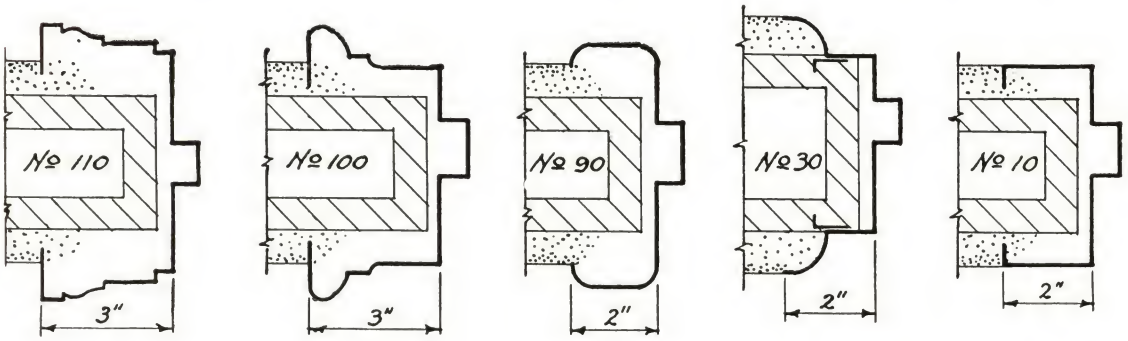
All work by Steelbilt is guaranteed against any and all defects in workmanship and material which may appear within a period of one year after the completion and acceptance of the work by the architects or engineers, and Steelbilt will replace, without additional expense to the owner, any materials that may develop defects within that period, with properly finished and approved new materials.

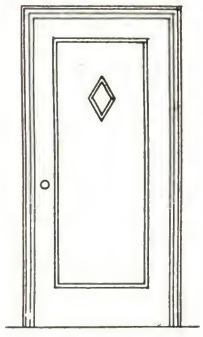
Installations

American Radiator Co.	Otis Elevator Co.
Seamen's Bank for Savings	Hegeman-Harris Co.
Hampshire House, Inc.	Wm. L. Crow Construction Co.
N. Y. Orthopaedic Hospital	H. K. Ferguson Co.
House of Detention for Women	M. Eidlitz & Son
Peoples Bank, Passaic, N. J.	Psaty & Fuhrman
Creedmoor Hospital	J. W. Ferguson Co.
Psychopathic Hospital	Seglin Construction Co.
A. B. See Elevator Co.	R. E. Smith Co.
Westinghouse Electric Elevator Co.	

Specifications and other information for your files will be sent upon request.







ELEVATION

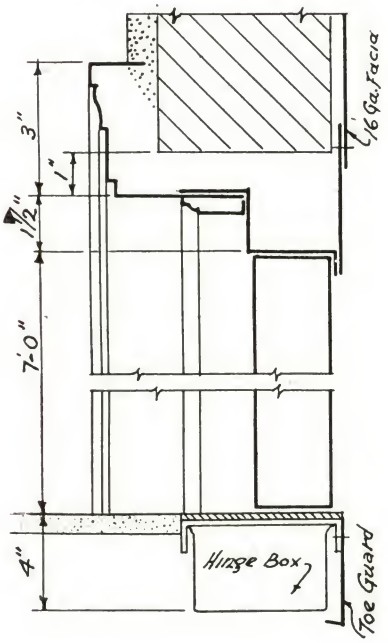
Pushbutton Elevator Fronts

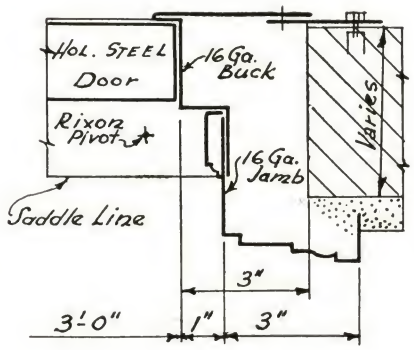
Swing Type

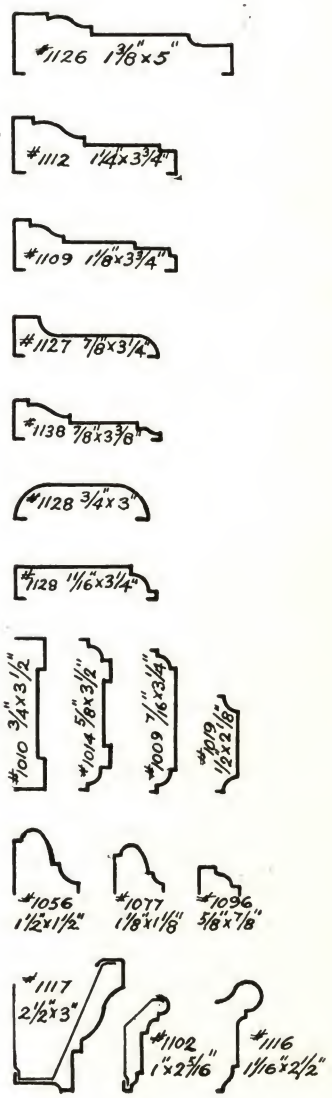
These complete fronts are carried in stock and are standardized as to size (3x7 ft.), with extension jambs and trims adapted to any wall thickness. The inside of the door is designed to be flush with the shaft and door is hung on Rixson floor hinges.

Bronzalun sills for first floors, Feralun sills for upper floors, and Corbin anti-friction T-handle latches are furnished as standard equipment.

Finished in plain enamels, stippled or shaded or striped bronzes as required. Prices and full details upon request.







DETAILS OF PUSHBUTTON ELEVATOR FRONTS—SWING TYPES

THE RIESTER & THESMACHER COMPANY

Hollow Metal Doors and Trim

1514-1526 West 25th Street
CLEVELAND, OHIO

Products

HOLLOW METAL DOORS; COMBINATION TYPE FRAMES; PARTITIONS; ELEVATOR FRONTS; METAL BASE and PICTURE MOULD.

Also Hose Cabinets and Access Doors.

For Steel Stairs and Special Steel Equipment, see Manufacturers' Index.

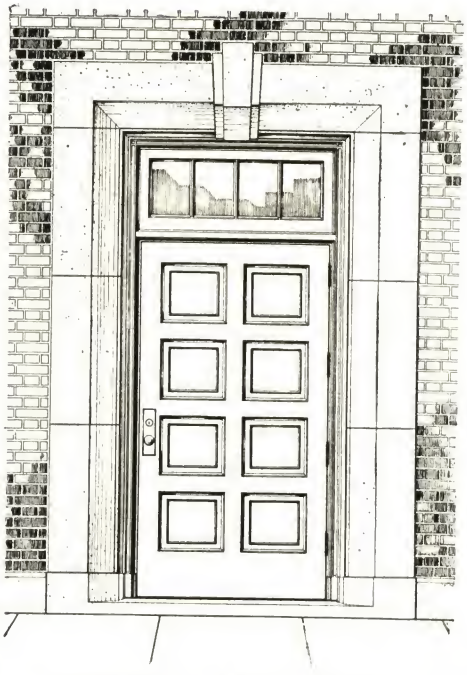
Construction

The R. & T. hollow metal door with its interlocking joint feature is capable of resisting greater fire exposure than the ordinary type of metal door construction. Doors are constructed of first grade 18 gauge furniture steel full pickled, full cold rolled, reannealed, patent leveled, resquared and oiled. Jambs and casings are of same gauge material. Bucks or frames are fabricated from 10 to 14 gauge material in accordance with size of opening and service required. All door joints are electric process welded. Proper reinforcements are welded within the door and jambs to receive all hardware. These doors can be fitted to either the cabinet jamb design or combination type frame. R. & T. hollow metal doors, having no combustible material within the door, are fire retarding and fully meet the requirements of the National Board of Fire Underwriters and bear their label, when specified.

Finish

Before assembly, all parts are thoroughly cleaned and paint dipped to protect the interior of the door. Before final finish all surfaces are thoroughly cleaned to remove grease or oil.

Each coat of paint or enamel is carefully baked and properly treated to secure a superior finish. Doors are finished in prime coat, plain color enamels, stipples and wood graining reproductions.



Typical Door and Trim Installation

Hardware

Hardware as selected and furnished by the owner, is applied at our factory. Upon request we are glad to furnish full size section drawings of our stock mouldings, jambs and trim to assist in designing metal door units.

References

A few buildings of varied types and their architects' in which we have recently made installations of metal doors and trim:

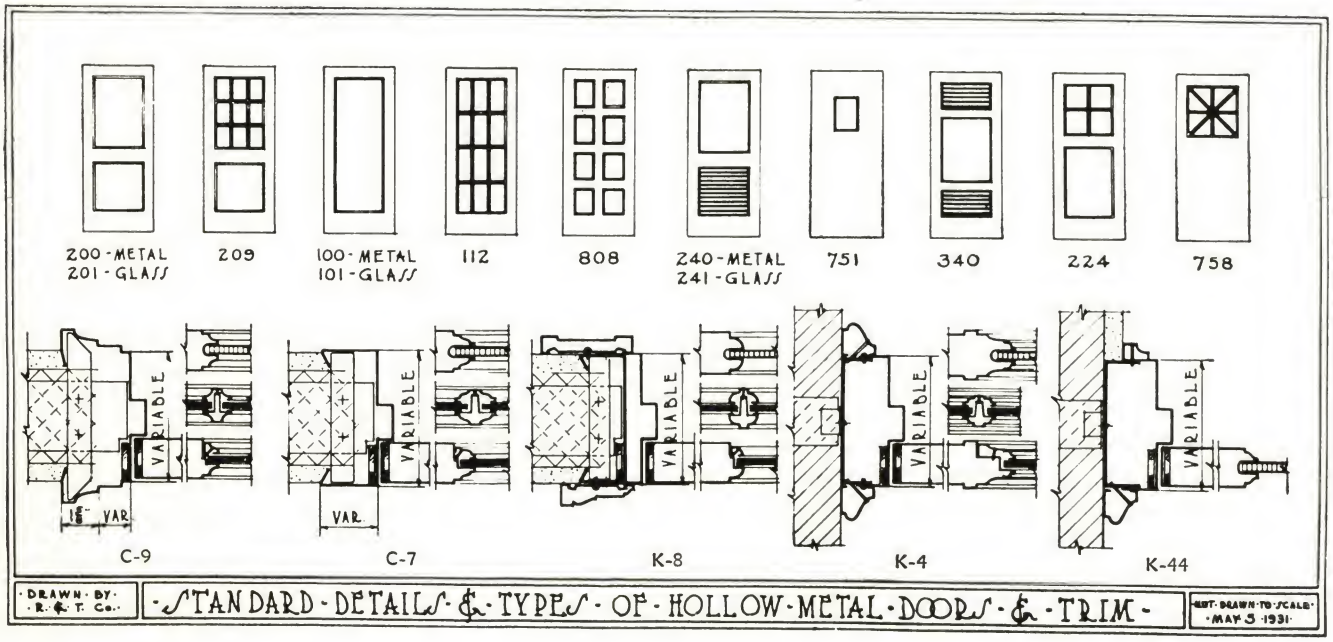
Cleveland Public Auditorium, and Cleveland City Hospital Group, Cleveland, Ohio, *Herman S. Kregelius (City Architect)*

Women's Hospital, Detroit, Mich., *Albert Kahn, Inc.*

Weymouth Power Station, Boston, Mass., *Stone & Webster*

Cuyahoga County Jail and Criminal Courts Building, Cleveland, Ohio, *Warner & Mitchell*

Cuyahoga County Detention Home and Juvenile Courts Building, Cleveland, Ohio, *Frank W. Bail, Architect*



THE THORP REFERENCE BOOK OF FIRE PROOF DOORS

FPTDC

LOCAL REPRESENTATIVE

THORP FIRE PROOF DOOR CO.

1600-1610 Central Avenue
MINNEAPOLIS, MINN.

THORP FIRE PROOF PRODUCTS

On this and succeeding pages will be found illustrations, details, and specifications of the following Thorp products:

KALAMEINED DOORS, FRAMES and TRIM which may be covered in furniture steel, stainless steel, copper, bronze, nickel silver, monel metal or aluminum.

HOLLOW METAL DOORS, FRAMES and TRIM which may be made up in furniture steel, stainless steel, bronze, nickel silver, monel metal or aluminum.

EXTRUDED DOORS, FRAMES and TRIM which may be made up of bronze, nickel silver or aluminum shapes.

ELEVATOR DOORS of hollow metal or tubular construction made up in the same metals as hollow metal doors or from extruded shapes.

ROLLED and FORMED HOLLOW METAL FRAMES.

The illustrations give a slight idea of the range of design and finishes available in Thorp products. Our stock dies and mouldings permit of considerable latitude in design, but where special shapes requiring new tools are desired a small additional charge is made unless the job is sufficiently large to permit the charge to be absorbed by us.

Entrance in Hollow Bronze Construction for the Registry of Deeds Building, Worcester, Mass.
E. M. CORBETT, Architect

Drawings—Shop drawings are submitted for the architect's approval before any fabrication is begun.

Where large size details or solutions of special problems are desired by architects they will be furnished upon request.

Finishes—Standard finishes on copper, bronze or nickel silver. Brass or copper plated finishes on steel for interior use only.

Plain color baked enamel or lacquer finishes on steel.

Baked-on grained finishes on steel.

Acid etched finishes on steel, bronze, nickel silver or aluminum.

Approval—Thorp products have been tested by the National Board of Fire Underwriters and approved for use with their labeled service in certain types of openings. This labeled service covers both kalamein and hollow metal doors as well as elevator openings.

ARCHITECTURAL SPECIFICATIONS

Kalameined Work—Steel Covered

All kalameined work shall be of Thorp construction having built up white pine cores. Cores for the doors shall be covered with heavy asbestos paper, the door covering being made up as a single sheet for each face of the door. Mouldings of the solid panels shall be an integral part of the stiles and rails. No nailed-in mouldings or soldered joints will be permitted. The metal covering shall be held in place by a band set in the edge of the door fastened with long screws. Where doors are used for exterior work the cores shall be given a heavy coat of linseed oil before the application of the asbestos and metal covering. Steel covering shall be not less than 24-gauge for stiles and rails, 20-gauge for panels. This contractor shall fit for all mortise hardware. This hardware shall be delivered to the door manufacturer by another contractor, all charges prepaid.

Kalamein Work—Covered in Copper, Bronze or Aluminum

All kalameined work shall have a metal covering of not less than 22-gauge bronze, copper or nickel silver, or 20-gauge aluminum. All mouldings for solid panels shall be an integral part of the stiles and rails. The various members forming the stiles, rails and solid panel covering shall be built up with inside lock seams. All joints of mouldings shall be neatly fitted. Cores shall be built up as specified above for steel covered work and the covers held in place in the same manner, using bands of the same metal as the covering, the bands to be held with long screws of the same metal as the covering. Fit for hardware as specified under the heading of Steel Covered Work.

SPECIFICATIONS—Continued

Hollow Metal Work

Hollow metal doors and frames shall be manufactured by Thorp. The doors shall be made up of 18-gauge furniture steel with clean, sharp mouldings, all joints being welded solid, ground smooth and rendered invisible. Cork or other suitable sound deadening material shall be placed in the stiles and rails. The panels shall be formed of two sheets of 20-gauge furniture steel with fibre or asbestos board filling. Mouldings for glass panels shall be welded into frames, stationary moulding being welded in place. Provide reinforcement for, cut, and fit for all mortise hardware which will be furnished to this contractor by another contractor.

Hollow Bronze, Nickel, Aluminum or Stainless Steel

The work under this heading shall be (specify kind and gauge of metal), all joints shall be neatly fitted, securely fastened by riveting, or welding where welding is suitable, ground smooth and rendered invisible. The specifications governing the sound deadening and fitting of hardware for hollow steel work shall apply to this work also.

Labeled Openings

Labeled doors shall be furnished where called for, they shall be built in accordance with the requirements of the National Board of Fire Underwriters, and shall bear the proper labels for the openings in which they occur.

Note: U. S. Standard gauges are used for steel and monel metal; Browne and Sharpe gauges for other metals.

Finishes

The following specifications cover the various finishes on steel covered kalameined doors, frames and trim or hollow steel doors, frames and trim.

Primed—All work shall be thoroughly cleaned of grease, rust and other impurities, sanded smooth, glazed, and given a prime coat of red oxide.

Enameled—All work shall be thoroughly cleaned of grease, rust and other impurities, sanded smooth, glazed, and given a 7-coat baked enamel finish in colors to be selected. It shall be well sanded between coats, the final coat being rubbed to an eggshell finish.

Grained—All work shall be thoroughly cleaned of grease, rust and other impurities, sanded smooth, glazed, and given a 7-coat baked-on grained finish to match the adjoining woodwork. It shall be well sanded between coats, the final coat being rubbed to an eggshell finish.

Lacquered—All work shall be thoroughly cleaned of grease, rust and other impurities, sanded smooth, glazed, and given a 7-coat lacquer finish in colors to be selected. The work shall be lightly sanded between coats so that the final coat presents a smooth eggshell finish.

Acid Etching on Steel—(Not recommended for exterior work.) Acid etch work where shown to match sample selected finishing same with 2 coats of clear lacquer.

Plated Finish—(Used on Kalameined work only—not recommended for exterior work.) Thoroughly clean all work of grease or scale, copper plate and finish to color selected. Finished work to have a heavy coat of clear lacquer.

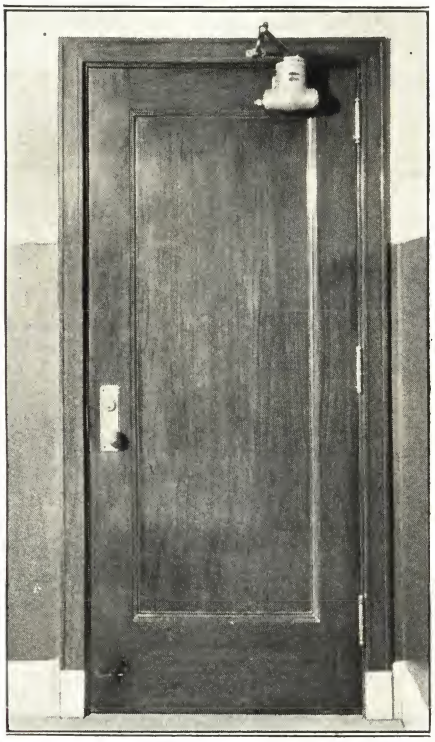
Satin Finish—Kalameined work covered in copper or bronze shall be given a satin finish oxidized to color selected and given a heavy coat of clear lacquer.

Hollow bronze work shall be given a satin finish oxidized to the shade selected and given a heavy coat of clear lacquer.

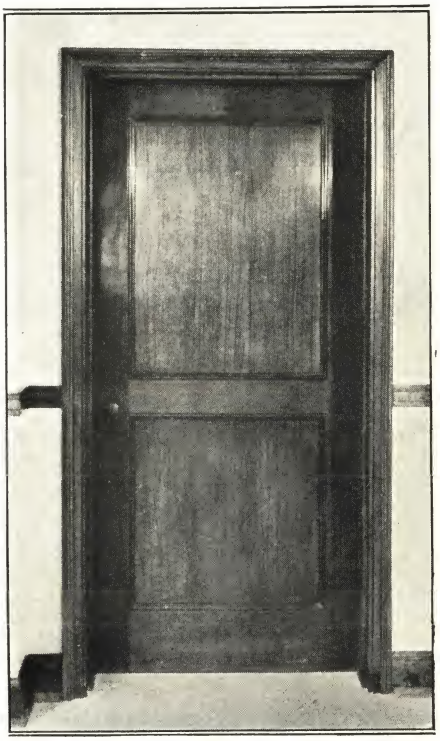
Bronze covered kalameined work and hollow bronze work shall have a satin finish left natural and given a heavy coat of clear lacquer.

Kalameined work covered in white metals, hollow work in white metals shall have a satin finish with a heavy coat of clear lacquer.

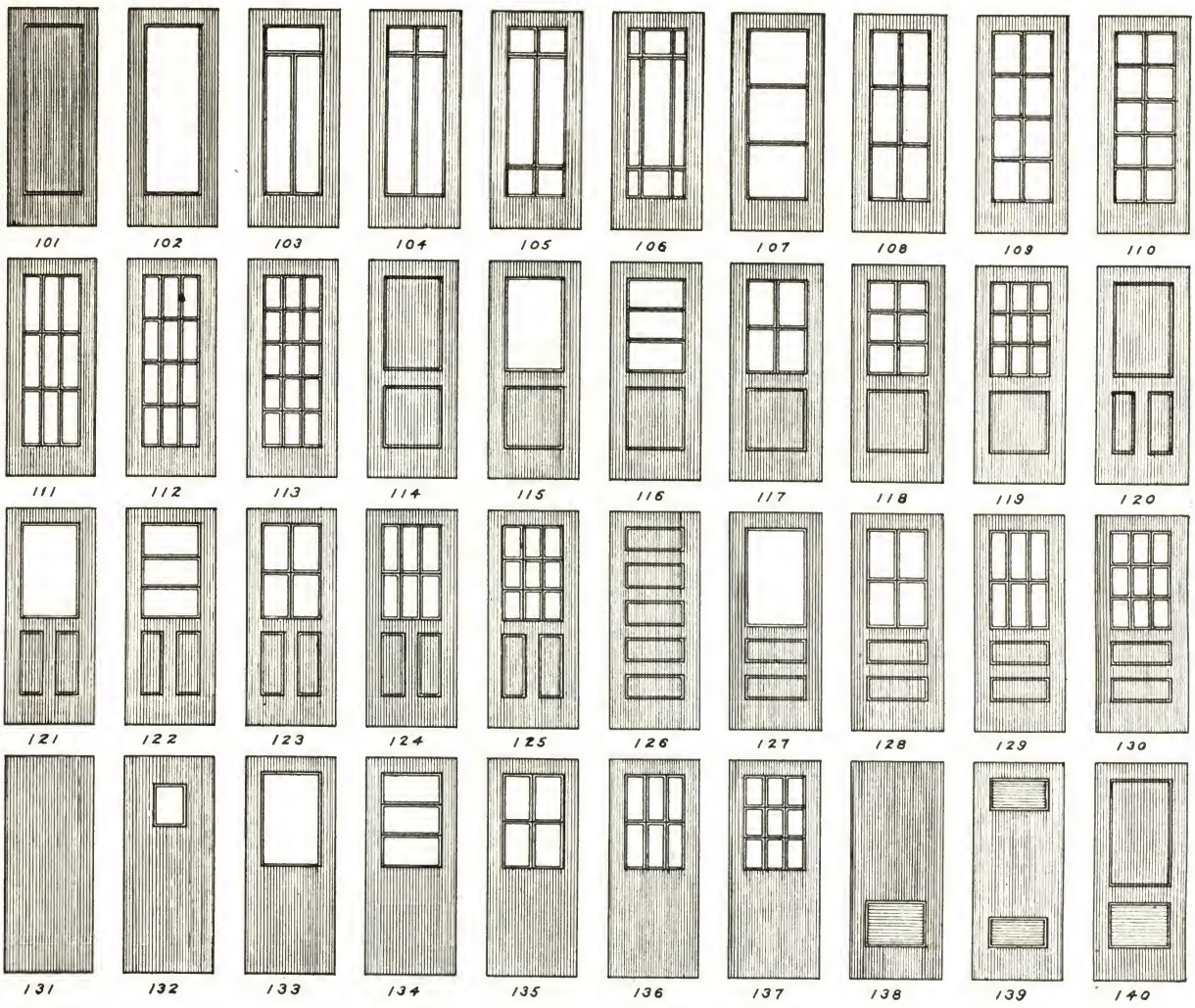
Samples—The manufacturer shall submit to the architect and obtain his approval of samples of the various finishes required for the above work.



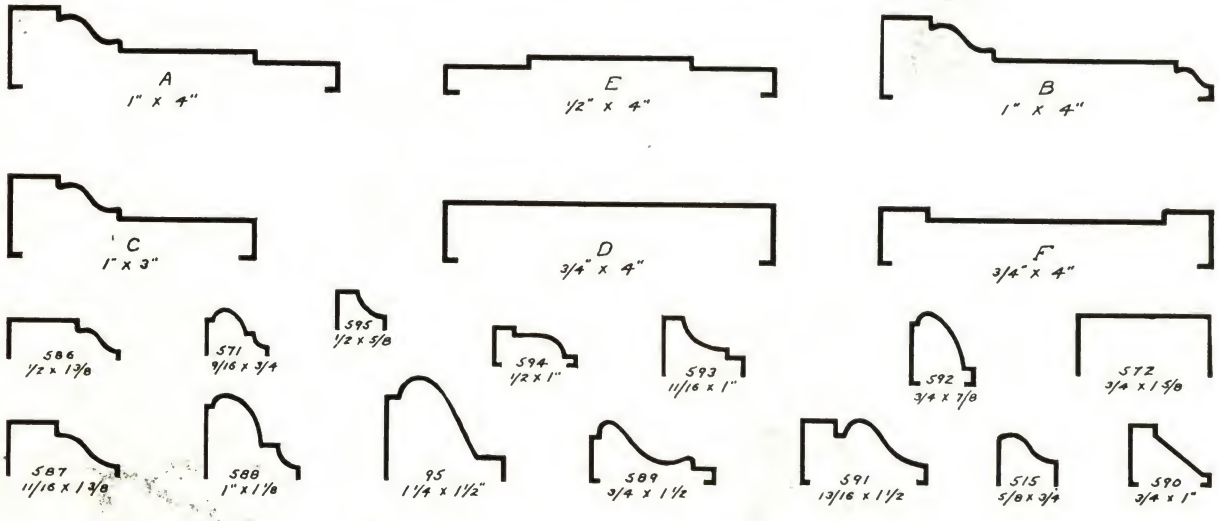
Labeled Kalamein Stair Door in Grained Finish, Northwestern National Bank, Minneapolis, Minn.
Graham, Anderson, Probst & White, Architects



Hollow Steel Stair Door in Grained Finish, Spokane & Eastern Trust Co., Spokane, Wash.
A. Moorman & Co., Architects



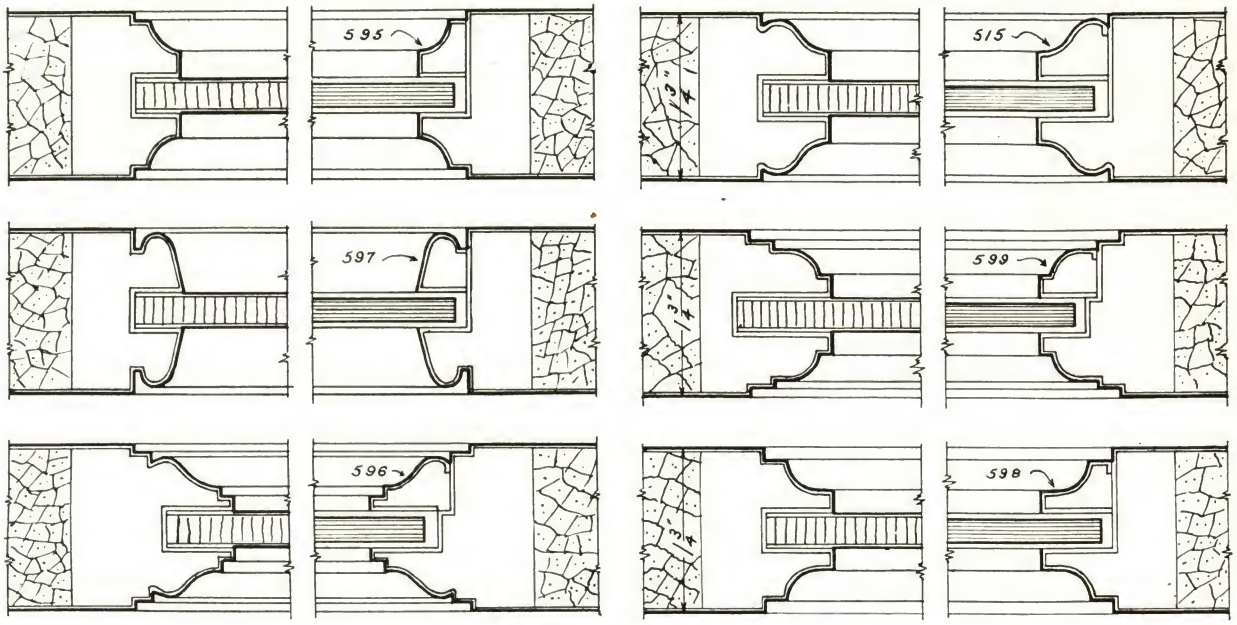
·SUGGESTIVE SWING DOOR DESIGNS·



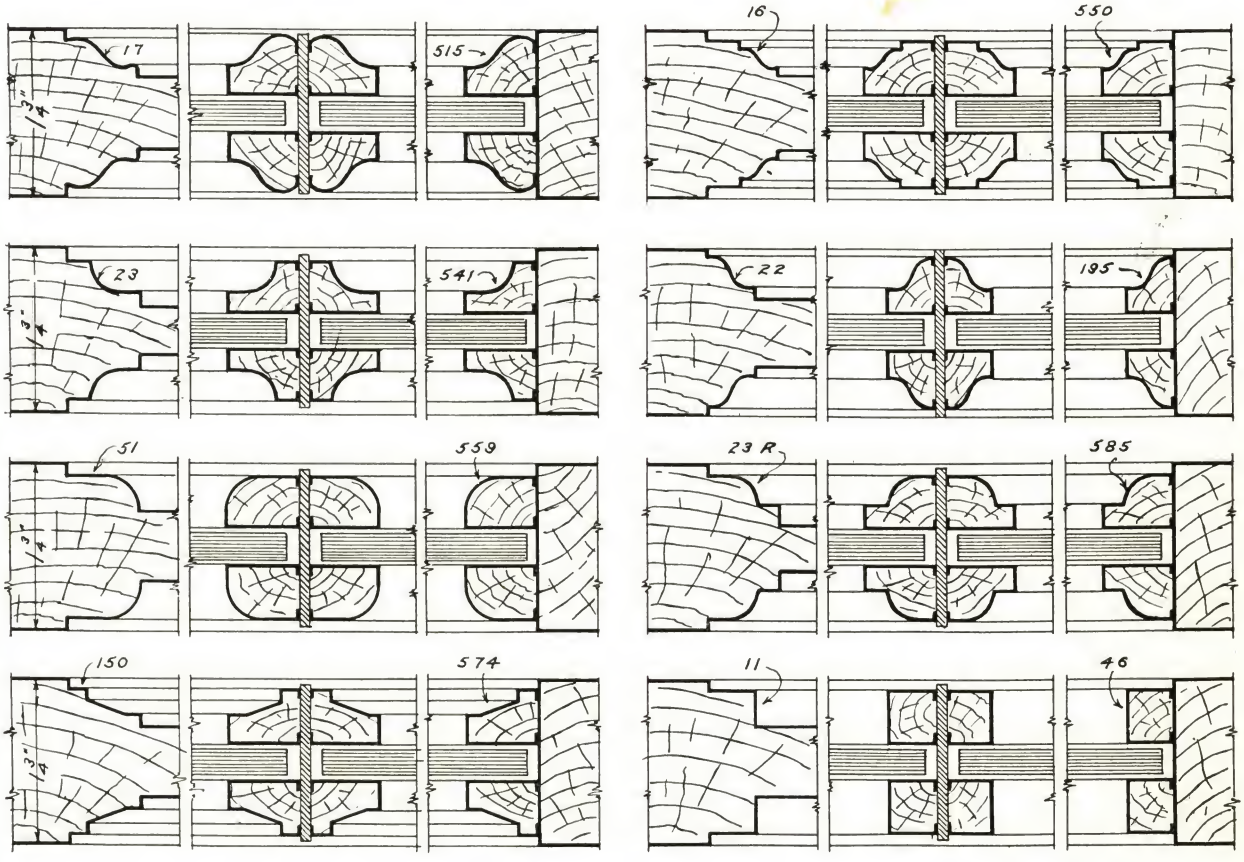
SOME SELECTED CASINGS AND MOULDINGS

·DOOR DESIGNS AND HOLLOW TRIM·

UNDERWRITERS LABELS · IF · REQUIRED ·

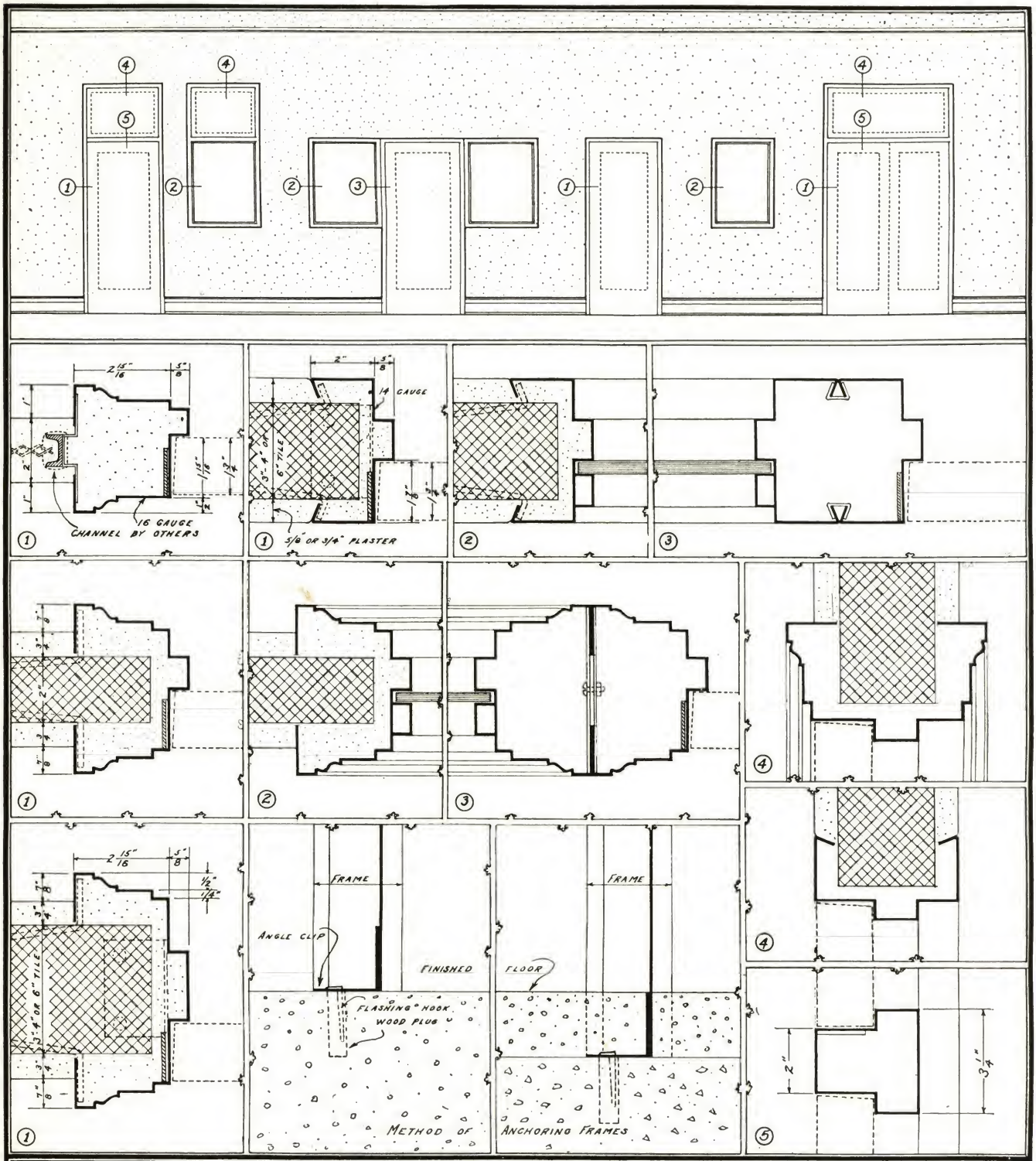


PANEL AND GLASS MOULDS FOR HOLLOW DOORS



PANEL AND GLASS MOULDS FOR KALAMEIN DOORS

PANEL AND GLASS MOULDINGS



Hollow Frame Specifications

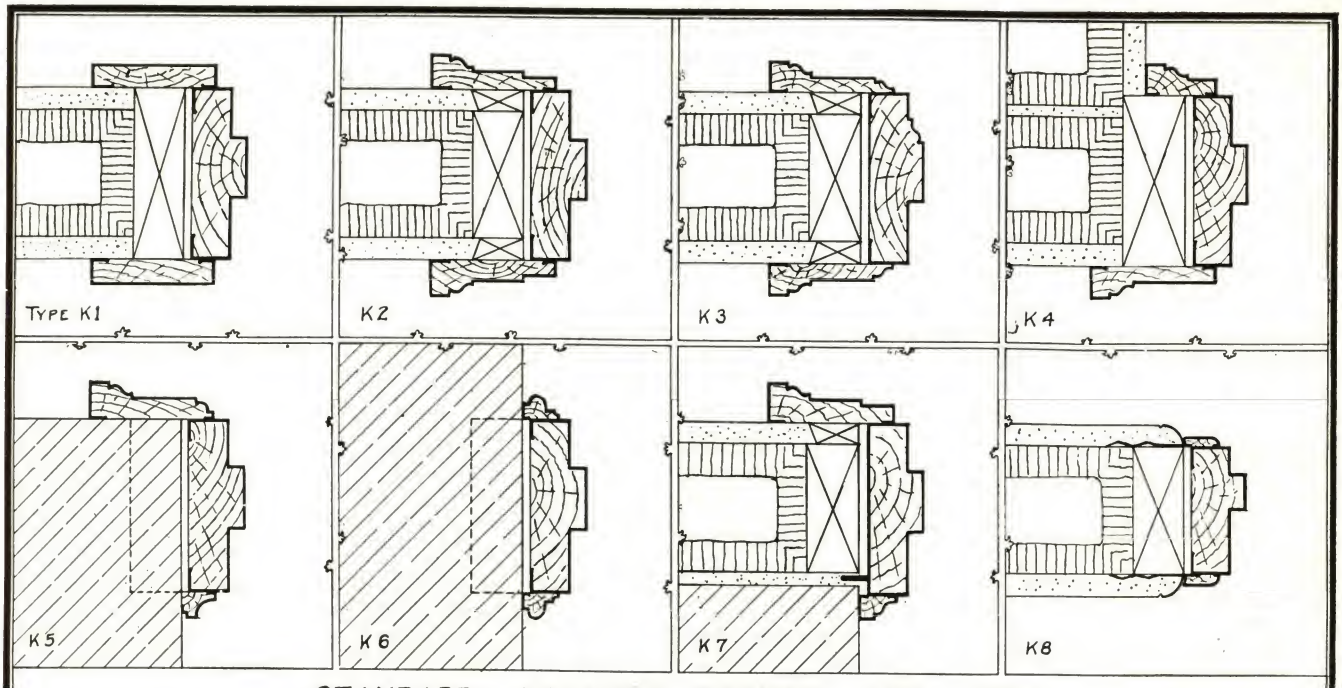
Rolled Hollow Metal Frames—Hollow metal frames shall be Thorp standard rolled sections 16-gauge moulded combination frame and casing or 14-gauge plain frame. All joints shall be neatly fitted, solidly welded and ground smooth. Provide reinforcement for, cut and fit for mortise hardware. Provide wire anchors for anchoring frames to tile or brickwork and angle clips at the bottom of each jamb for anchoring same to rough floor. (Corrugated sheet anchors and channel spreaders furnished at an extra charge.)

Formed Hollow Metal Frames—Where hollow metal frames are of the unit type they shall be of 12, 14, or 16-gauge furniture steel formed as detailed. All joints shall be neatly fitted, solidly welded and ground smooth. Provide reinforcement, cut and fit for mortise hardware. Provide wire anchors, etc., as specified for Rolled Frames.

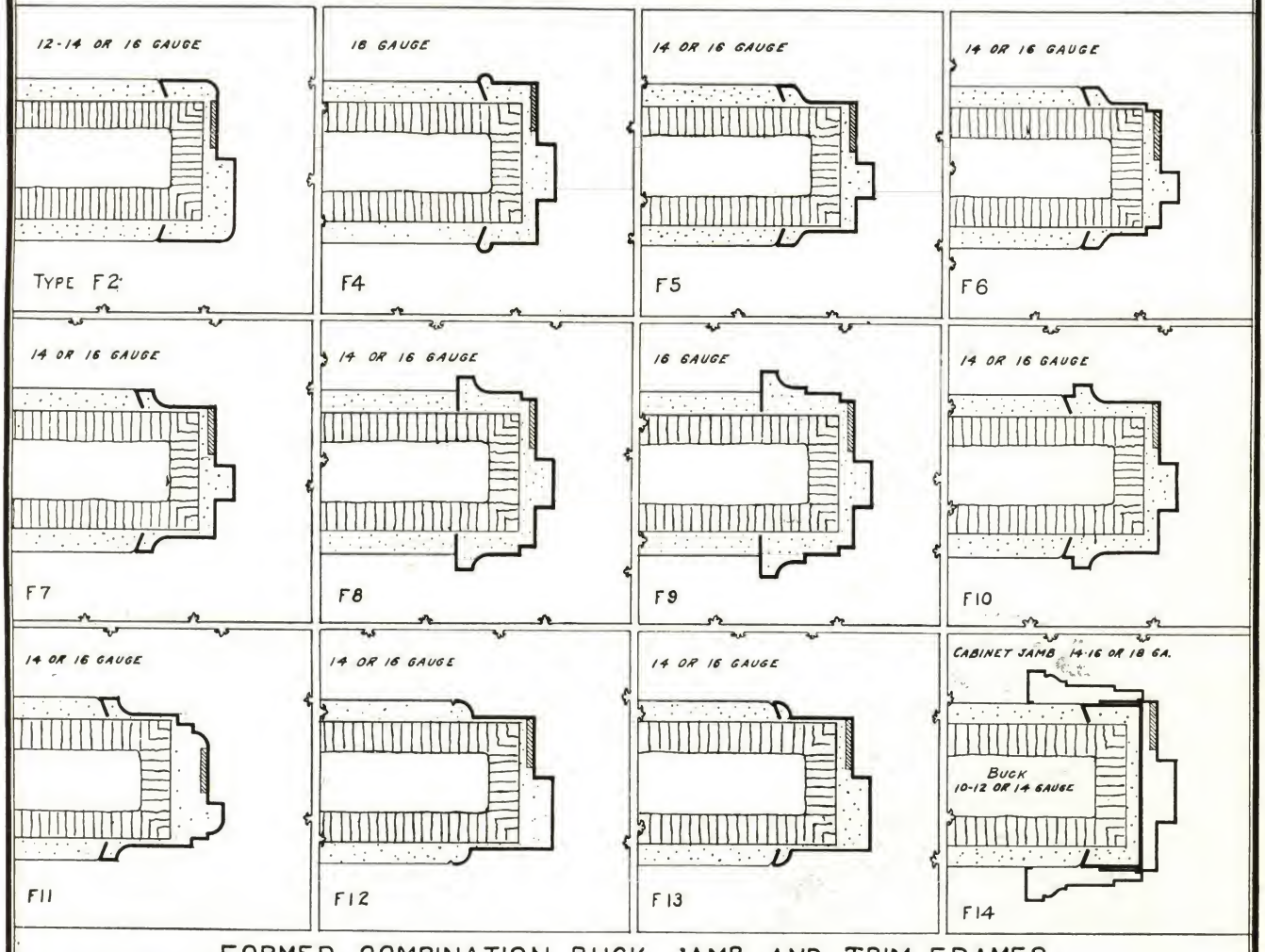
Cabinet Jambs and Rough Bucks—Cabinet jambs shall be not less than 18-gauge steel reinforced for, cut and fitted for hardware. Rough bucks shall be of not less than 14-gauge steel equipped with anchors, etc. as specified under the heading of Rolled Metal Frames.

ROLLED COMBINATION BUCK JAMB AND TRIM FRAMES

FRAMES ALSO ROLLED WITH RABBETS FOR 1-3/8" DOORS
UNDERWRITERS LABELS IF REQUIRED



STANDARD KALAMEIN FRAMES AND TRIM



FORMED COMBINATION BUCK JAMB AND TRIM FRAMES
UNDERWRITERS LABELS IF REQUIRED

TYPES OF SWING DOOR FRAMES

THORP ELEVATOR ENCLOSURES

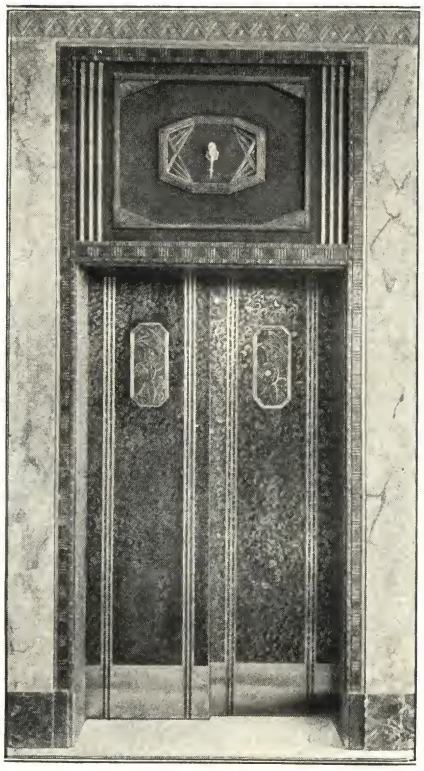
Thorp elevator enclosures are made in a variety of designs, materials and finishes, some of which are shown on this page and covered by the specifications.

In addition to the examples shown we are prepared to furnish enclosures in which the doors and trim are embellished with etched designs on steel, bronze, or any of the white metals, or with cast ornaments in the same metals. Enclosures may also be built up of extruded sections of bronze, nickel silver (white bronze) or aluminum.

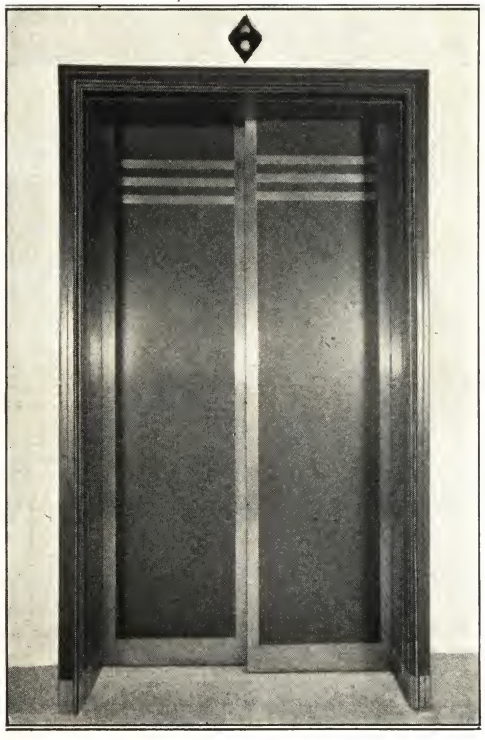
Thorp elevator enclosures have been tested by the National Board of Fire Underwriters and approved by them for labeled service in Class B and C openings. This service will be furnished when specified.

For these labeled openings the Underwriters require interlocking members where the doors overlap each other and overlap the frame at the jambs and head. A special type of construction is also required for the doors.

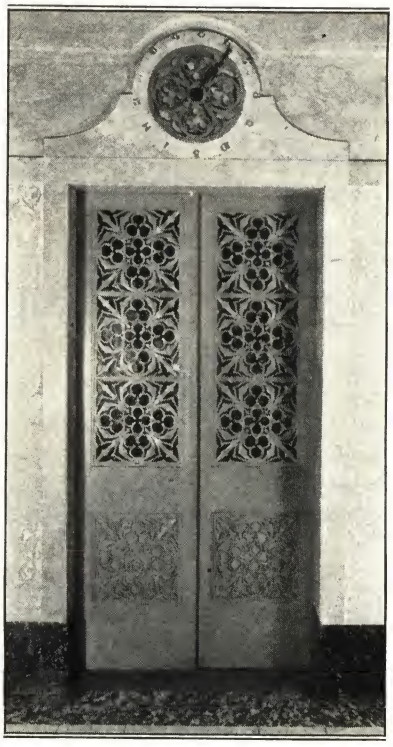
Our Engineering Department is ready at all times to co-operate with architects and elevator contractors in working out problems of construction and design.



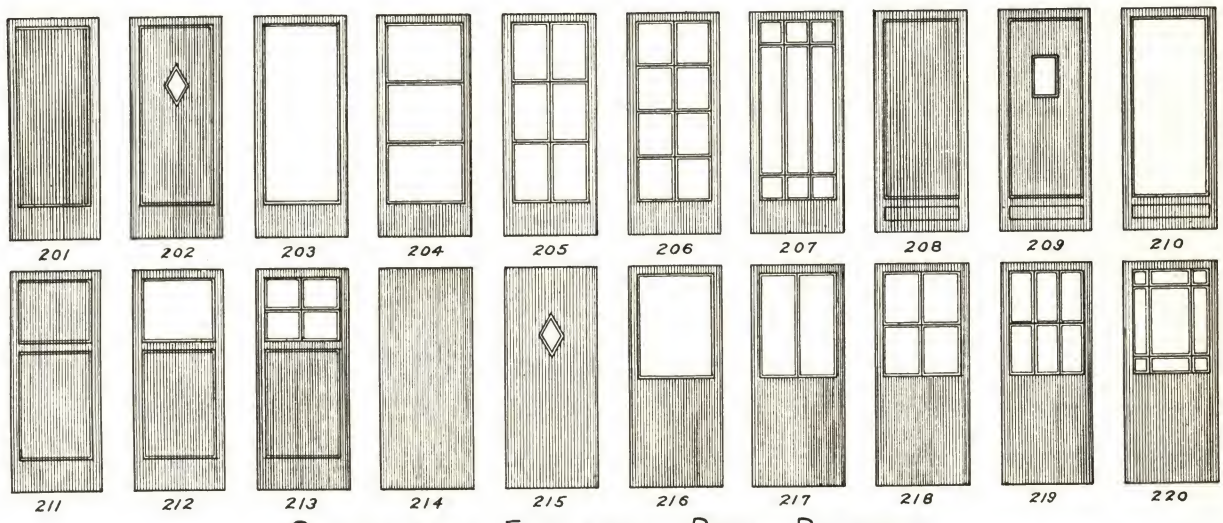
Passenger Elevator Doors with Nickel Silver Ornamentation on Etched Steel, Spokane & Eastern Trust Co. Building, Spokane, Wash.
A. Moorman & Co., Architects



Passenger Elevator Doors, Labeled Construction, Lacquer Enamel Finish, Nickel Silver Trim, Main Central Office Building, Minneapolis, Minn.
Hewitt & Brown, Architects



Steel Elevator Doors, Tube Construction with Cast Grilles and Ornament, Enameled Finish, Elks Club, Memphis, Tenn.
Geo. Mahan, Jr. and J. J. Broadwell, Architects



SUGGESTIVE ELEVATOR DOOR DESIGNS

Specifications for Elevator Enclosures

Doors—Elevator doors shall be of tubular construction or of 18-gauge hollow construction of the design and type shown. All joints shall be neatly welded, ground smooth and rendered invisible. Mouldings shall be selected from the manufacturer's stock dies; they shall be neatly mitred and welded into frames. Stationary glass panel mouldings in steel doors shall be welded in place, loose mouldings fastened in place with special head machine screws. Panels shall be formed of two sheets not less than 20-gauge with fibre board or asbestos board filler between. Provide reinforcements, cut out and fit for hardware. Bottom of doors shall have a continuous fin full width of the bottom rail with specially treated noiseless fibre pads at each end.

Combination Frame, Buck and Trim—Frames shall be combination frame, buck and casing not less than 16-gauge steel with track housing and movable track cover. The track reinforcement shall be not less than $\frac{3}{16}$-in. plate extending the full length of the track. Provide closer supports extending from the sill to the overhead beam with an angle strut at the striker jamb extending from the head of the frame to the overhead beam. Provide hardware reinforcement. All joints shall be neatly fitted, welded and ground smooth.

Cabinet Jambs, Trim, and Rough Bucks—Provide rough bucks of not less than 14-gauge steel with track housing and movable track cover. The track reinforcement shall be of not less than $\frac{3}{16}$-in. plate extending the full length of the track. Provide closer supports extending from the sill to the overhead beam with an angle strut at the striker jamb extending from the head of the frame to the overhead beam. Provide hardware reinforcement. The cabinet jambs shall be not less than 18-gauge furniture steel, the trim shall be not less than 20-gauge furniture steel. All joints and trim shall be neatly fitted, welded and ground smooth.

Sills—Sills shall be cast iron (cast bronze or aluminum) with checkered or fluted non-slip surfaces (or an abrasive surface). The grooves shall be machine cut and all screw and bolt holes drilled and tapped to template. Furnish suitable anchors for attaching sills to the rough floor or beams.

Shaft Fascias—These shall be of not less than 14-gauge furniture steel, reinforced and stiffened to eliminate vibration. They shall extend 8 in. on each side of the car opening from the head of the track housing to the sill of the floor above. Place toe guards at the bottom landings extending 18 in. below the finished floor.

Track and Hangers—Specify make and type desired.

Closers and Interlocks—These are usually specified as part of the elevator machinery contract; if included in this work specify make and type.

Finishes—The same specifications for finishes on hollow metal doors, frames and trim may be used for this work.

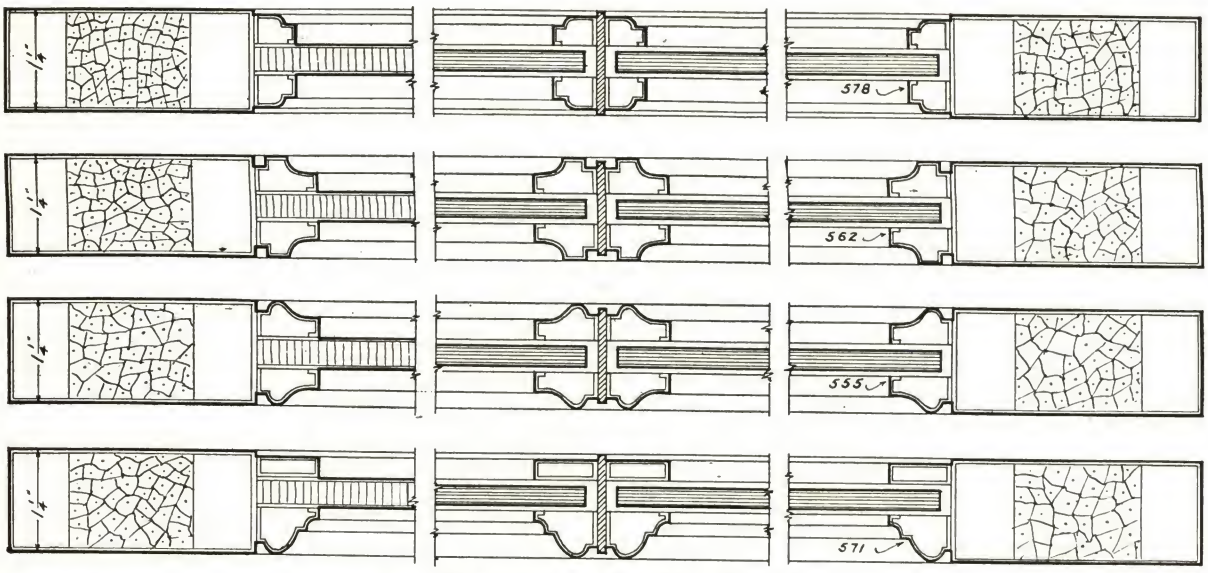
Etched Work—The architect will furnish the designs for the etched work which shall be followed as faithfully as this class of work will permit. Etching shall be cut sufficiently deep to show sharp, clear lines. Oxides shall be used to obtain the shading effect on non-ferrous metals; lacquer enamels shall be used for other colors. The finished work shall be given a heavy coat of clear lacquer. Submit prints of the design and samples of colors to the architect for his approval before proceeding with the work.

Cast Ornament—This work shall be in accordance with the architect's details. Submit photographs of the models for approval before beginning manufacture. All lines shall be clear and sharp, background shall have a sanded finish, the high lights polished.

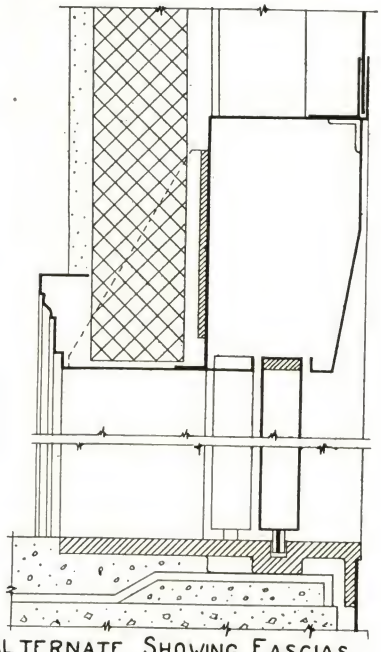
Labeled Openings—The elevator openings shall be built in accordance with the requirements of the National Board of Fire Underwriters and shall bear their labels.

ELEVATOR DOOR DESIGNS AND SPECIFICATIONS

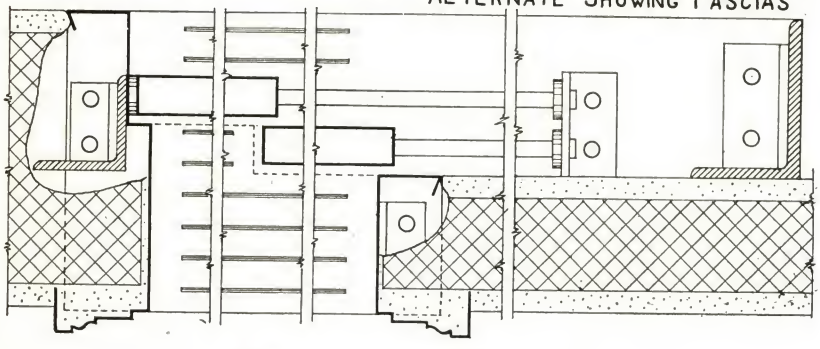
UNDERWRITERS LABELS IF REQUIRED



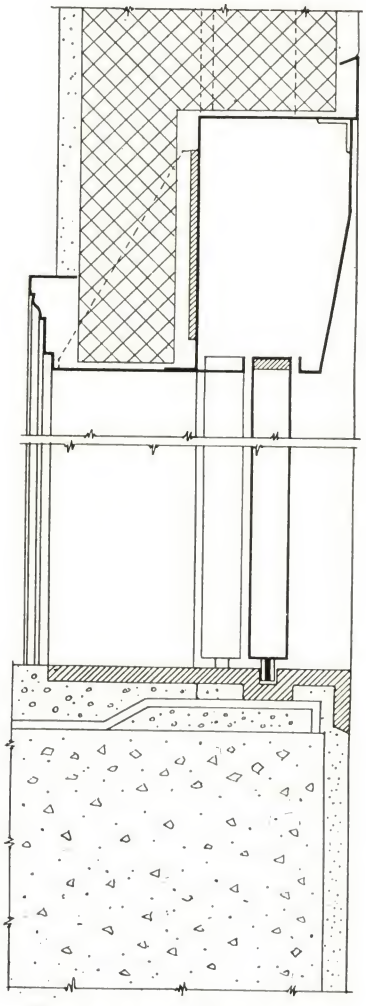
PANEL AND GLASS MOULDS



ALTERNATE SHOWING FASCIAS

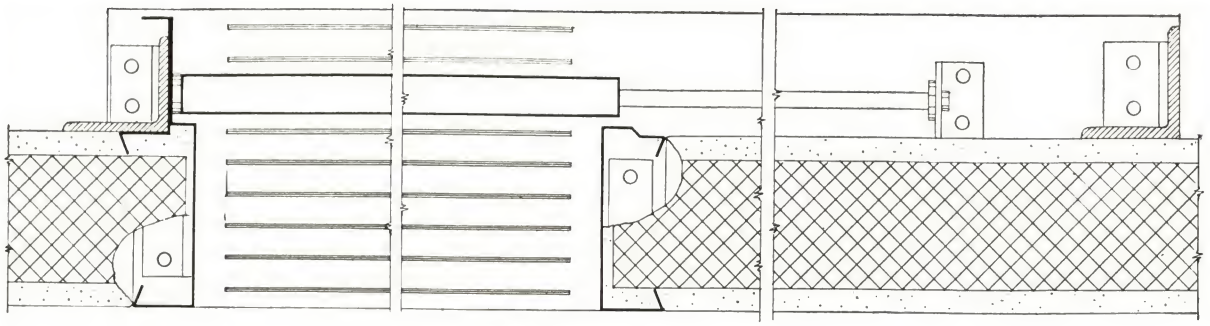


HORIZONTAL SECTION

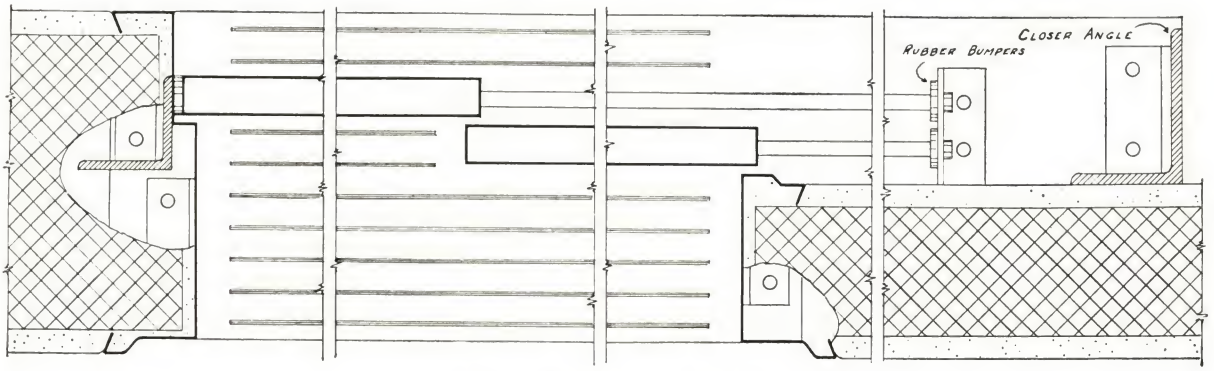


VERTICAL SECTION

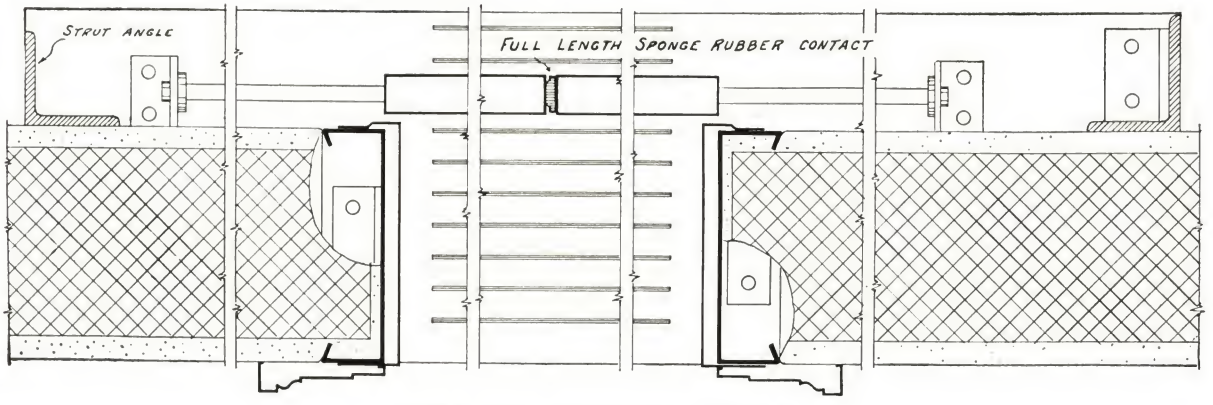
ELEVATOR DETAILS



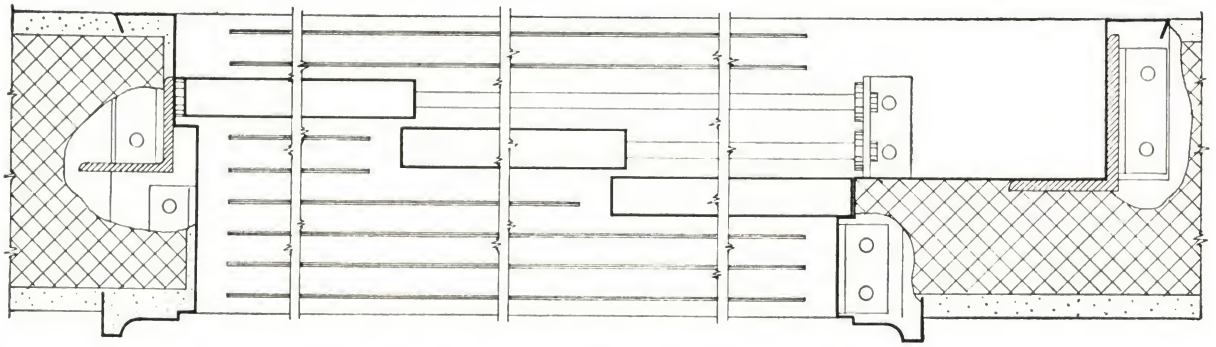
SINGLE SLIDING TYPE



TWO SPEED TYPE



CENTER OPENING TYPE



TWO SPEED AND FIXED PANEL TYPE

TYPES OF ELEVATOR ENCLOSURES

THE THORP REFERENCE BOOK OF FIRE PROOF DOORS

FPTOC

LOCAL REPRESENTATIVE

LIONEL VALLAS

Manufacturers of Sheet Metal Products

2846-50 West Lake Street, CHICAGO, ILL.

See Manufacturers' Index for our Hollow Metal Windows, Roof Flashing, Skylights and Ventilators

LIONEL HOLLOW METAL DOORS

Lionel Hollow Metal Doors are made in stock and special designs to conform with architectural designs.

Materials—The stiles, rails, panels and muntins are made of 18-gauge full cold rolled, pickled patent leveled furniture stock steel or galvanized iron. Mouldings are of 18 and 20-gauge cold rolled steel. Steel frames can be formed in materials from 10 to 18-gauge as desired.

Construction—All members are locked and welded, reinforcements are welded within the door for all hardware. The stiles and rails have cork or asbestos inserts to prevent metallic sound. Solid panels consist of two sheets 18-gauge steel with ¼-in. asbestos filler.

Note drawings for keyway and methods of holding moulding, glass panels and solid panels in place.

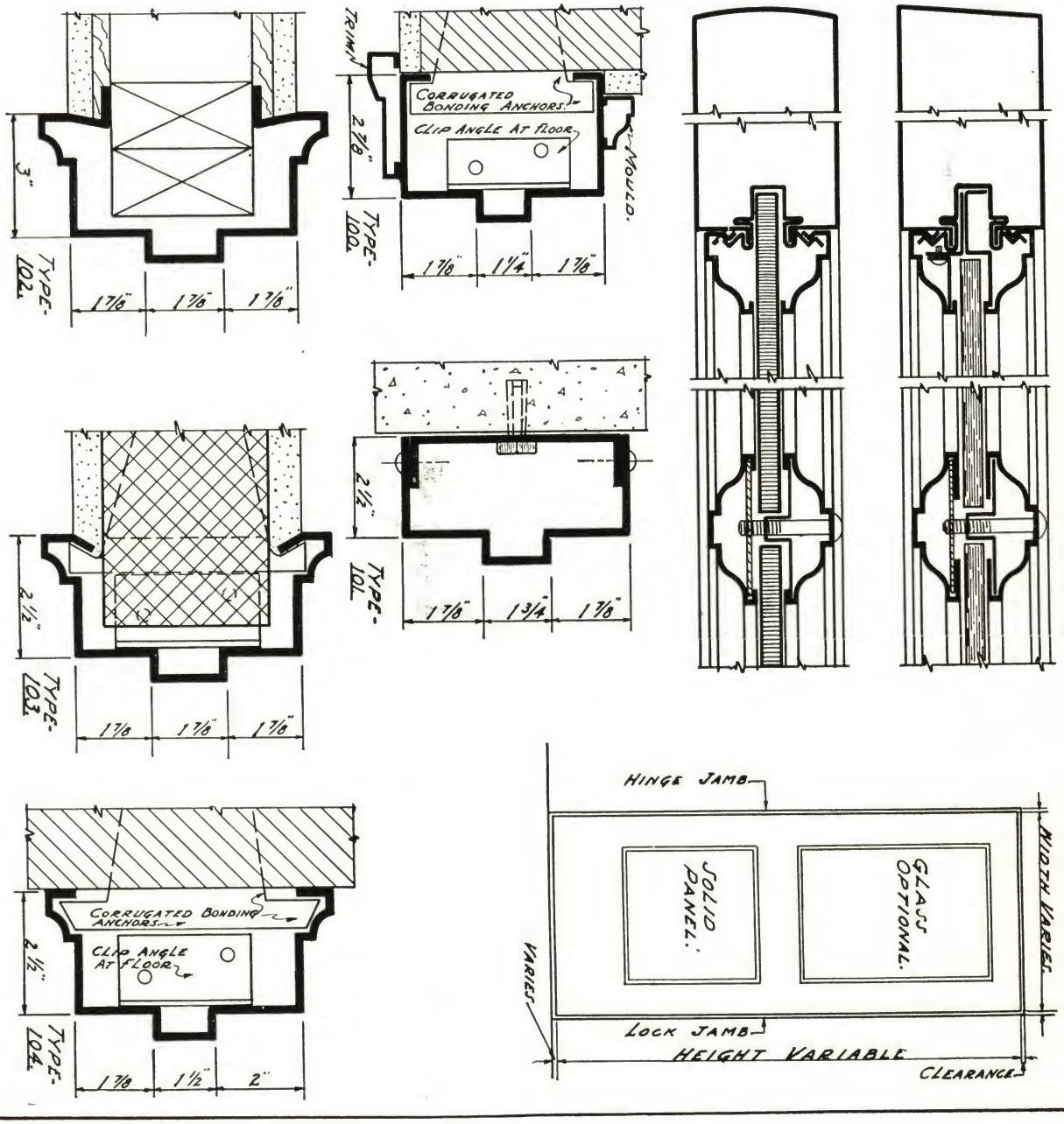
The frames are neatly made with sharp bends. Joints are all thoroughly and neatly welded. Reinforcements for hardware are welded within.

Fixed and adjustable anchors are furnished assuring solid construction.

All doors made in accordance with Underwriters' Laboratories, Inc., and labels can be furnished if desired.

Paint—All doors are given a shop coat paint. Baked enamel finish can be furnished to meet all requirements.

DETAILS OF LIONEL HOLLOW METAL DOORS



TRUSSBILT STEEL DOORS INC.

Manufacturers of Hollow Metal Doors and Trim

2575 Como Avenue, West
ST. PAUL, MINN.

3303 Como Avenue, Southeast
MINNEAPOLIS, MINN.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

HOLLOW METAL DOORS AND TRIM.
TRUSSBILT STEEL FLUSH DOORS.
ELEVATOR DOORS AND FRAMES.
Also Dumbwaiter Units—all types; Rolled Steel Door Frames.

Service

Our catalogue gives complete information on Trussbilt products for the modern building.

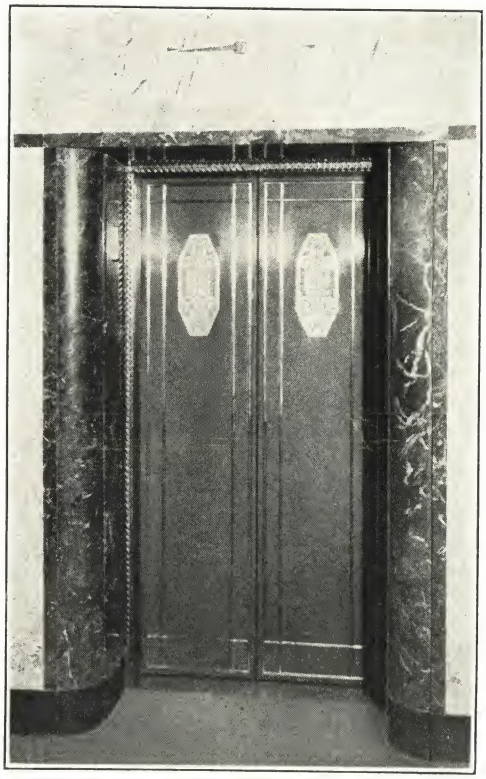
Any special problem will receive the prompt attention of our Engineering Department.

Experience and Facilities

Trussbilt products are always in tune with the times. Our craftsmen can express in metal the "Modern" and our facilities are adequate to meet the most exacting requirements.

Ten years' experience and progress in hollow metal construction has resulted in building up and maintaining an enviable reputation for responsibility, integrity and high quality of material and workmanship.

Trussbilt products are listed by the Underwriters' Laboratories, Inc.



Trussbilt Elevator Entrance, Medical Arts Building, St. Paul, Minn.
C. H. JOHNSTON, Architect

Elevator Entrances

The construction and structural framing of elevator entrances as built by Trussbilt have been accepted by the Architectural profession as good engineering practice.

Steel entrances are finished in plain color baked enamels, stipples and grained finishes. Color combinations, inlays, and stripes are used to complete any decorative scheme desired.

Trussbilt facilities make possible the fabrication of any ornamental or special designs in hollow metal construction of steel, bronze or white metal.

General

A complete line of hollow metal, including panel doors, Trussbilt flush doors, formed combination frames, rolled 16-gauge frames, bucks, jambs and trim, elevator entrances, etc. is manufactured by this company.

Painstaking care is used in the manufacture and finish to produce only a high grade product. Trussbilt materials having been in actual use for many years, have definitely established themselves as one of the leaders in the hollow metal industry.

Swing Door Installations

North Western Bell Telephone Building, Minneapolis, Minn., Hewitt & Brown, Architects.

Byllesby Engineering & Management Corp., Chicago, Ill., Minneapolis, Minn., Louisville, Ky., and Fargo, N. D.

Foshay Tower, Minneapolis, Minn.; Magney & Tusler, Architects.

First National Bank, St. Paul, Minn., Graham, Anderson, Probst & White, Architects.

Y. M. C. A., Kenosha, Wis., Chester H. Walcott, Architect.

Elevator Door Installations

Oklahoma Biltmore Hotel, Oklahoma City, Okla., Hawk & Parr, Architects.

Medical Arts Building, Pittsburgh, Pa., M. Nirdlinger, Architect.

Royal Bank of Vancouver, Vancouver, B. C.

Lowry Medical Arts Building, St. Paul, Minn., C. H. Johnston, Architect.

Washington Athletic Club, Seattle, Wash.

Y. W. C. A., Oklahoma City, Okla., Hawk & Parr, Architects.

Trussbilt Steel Flush Doors

The steel flush door construction as developed by the engineers of Trussbilt Steel Doors, Inc., is an outstanding improvement in the history of the hollow metal industry. Write for catalogue.

Trussbilt Steel Flush Doors are endorsed by many leading architects and engineers for all types of building because:

(1) They are strong and rigid.

(2) They cost much less than similar steel doors—not much more than wood doors.

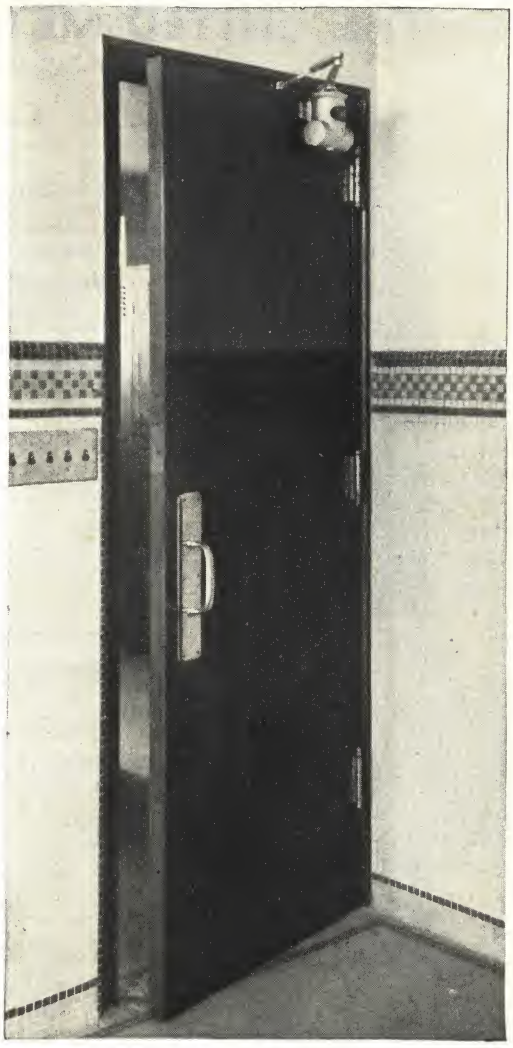
(3) They are approved by Underwriters' Laboratories, Inc.

Specification

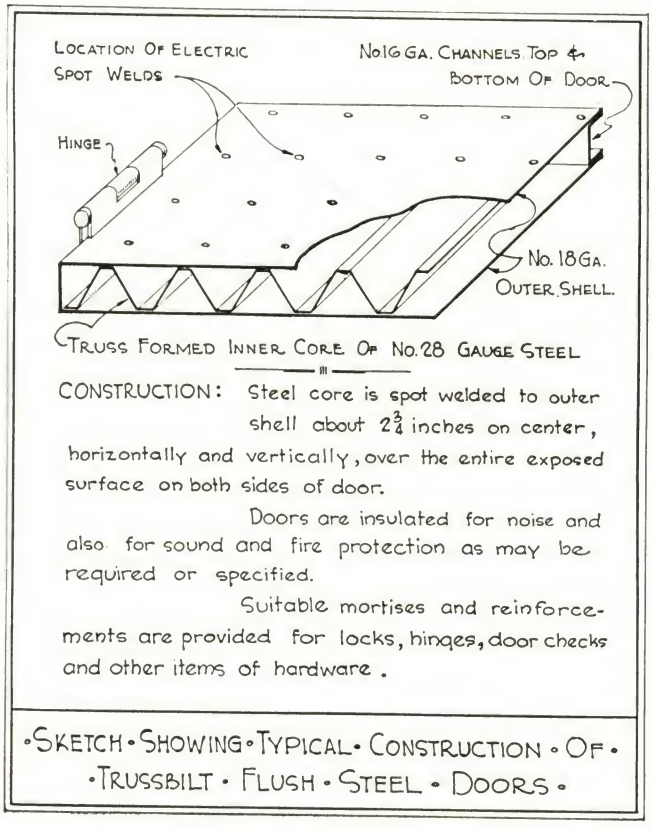
All doors, where shown on plans or schedule, shall be all-steel Trussbilt Flush Doors 1¾ ins. thick, reinforced with a continuous 28-gauge steel truss formed core, spot-welded both vertically and horizontally to the 18-gauge outer shells on approximately 2¾-in. centers.

Outer shells shall be 16-gauge steel if doors are not reinforced and spot-welded as specified above. Hardware is to be furnished by others and delivered prepaid to plant of door contractor. Hardware which does not interfere with crating or shipping to be applied by door contractor at factory at no additional cost.

Before doors are painted they shall be thoroughly cleaned, completely immersed in a rust-inhibiting primer, and baked, so the interior as well as the exterior is completely covered; follow with 3 coats for plain color work and 5 coats for grained finishes, all to be baked on. Final coat to be rubbed to an eggshell gloss.



Trussbilt Flush Steel Swing Door Unit



Trussbilt Steel Flush Door Installations

Mayo Clinic, Rochester, Minn., Ellerbe Co., Architects.

Hospital, University of Minnesota, Minneapolis, Minn., C. H. Johnston, Architect.

Security Benevolent Association Hospital, Topeka, Kan., W. E. Glover, Architect.

St. Francis Hospital, La Crosse, Wis., Parkinson & Dockendorff, Architects.

Hotel Douglas, Newark, N. J., Wm. E. Leyman, Architect.

Lincoln School, Pittsburgh, Pa., Thomas Pringle and Oliver Robling, Architects.

Monroe County Home, Rochester, N. Y., S. Firestone, Architect.

Women's Club, St. Paul, Minn., Magnus Jemne, Architect.

Kansas Gas & Electric Building, Wichita, Kan.

State Hospital, Waupun, Wis., Arthur Peabody, Architect.

Delaware County Prison, Delaware County, Pa., Thomas C. Trafford, Inc., Architects.

Hercules Powder Plant, Hercules, Del.

Safety Building, St. Paul, Minn., Frank X. Tewes, Architect.

THE UNITED METAL PRODUCTS COMPANY

Member of the Producers' Council

CANTON, OHIO

BRANCH OFFICES

NEW YORK, N. Y., Empire State Building
BOSTON, MASS., 1042 Little Building
BALTIMORE, MD., Baltimore Life Building
BUFFALO, N. Y., 382 Michigan Avenue
DETROIT, MICH., 923 Dime Bank Building
PHILADELPHIA, PA., 1600 Walnut Street
CLEVELAND, OHIO, 703 Leader Building
WASHINGTON, D. C., Burchell Building

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

Complete Elevator Entrances (Underwriters' Labeled).

Hollow Metal Doors and Trim.

Hollow Metal Office Partition.

Hollow Metal Fire Wall Doors (Underwriters' Labeled).

Conduo Base.

Also Metal Moulding, including Picture Moulding, Cornices, Base, Chair Rail, etc.

Plant and Facilities

The U.M.P. Co.'s plant and entire facilities are devoted to the manufacture of elevator entrances, hollow metal doors, frames and trim, office partition and conduo base required for the complete furnishing of office buildings, hotels, apartment buildings, hospitals, schools, etc. This Company also specializes in the manufacture of doors, frames and trim in stainless steel, aluminum and monel metals.

U.M.P. Standard Hollow Metal Doors and Trim

Stiles and Rails—Formed from No. 18 U.S. gauge steel, thoroughly pickled, double annealed, patent leveled, free from blisters, pits or other imperfections. Stiles and rails are formed of one piece of metal and interlocking channel is inserted in the stiles and rails providing reinforcement and also providing an interlocking member for the panel moulding. See illustration.

All stiles and rails have cork inserts of suitable size to prevent metallic sound.

Panels—Constructed of two sheets of No. 18 U.S. gauge steel. A filler of asbestos and felt is inserted to make the over-all thickness of panel $\frac{5}{16}$ in. Panels are inserted in a deep groove provided in panel moulding. Panel mouldings are neatly mitered or coped at all corners and intersections are welded. All seams and joints are oxy-acetylene welded their entire length. All joints are made perfectly level and invisible. Reinforcing bars of sufficient length and thickness are welded in hinge stile at all hinge cutouts. The bars are drilled and tapped for hinges. Reinforcing plates are spot welded in lock stile to receive locks, and additional reinforcements are placed in door to receive such hardware as is specified.

The construction noted above has been listed by the Underwriters' Laboratories, Inc., and has the Underwriters' approval.

Jambs—Made of the same quality steel as described for doors. No. 18 U.S. gauge steel for walls 7½ in. thick or less and No. 16 U.S. gauge steel for walls more than 7½ in. thick. Jambs are formed to detail and made to fit accurately over bucks, all intersecting members are neatly coped and fitted before shipment.

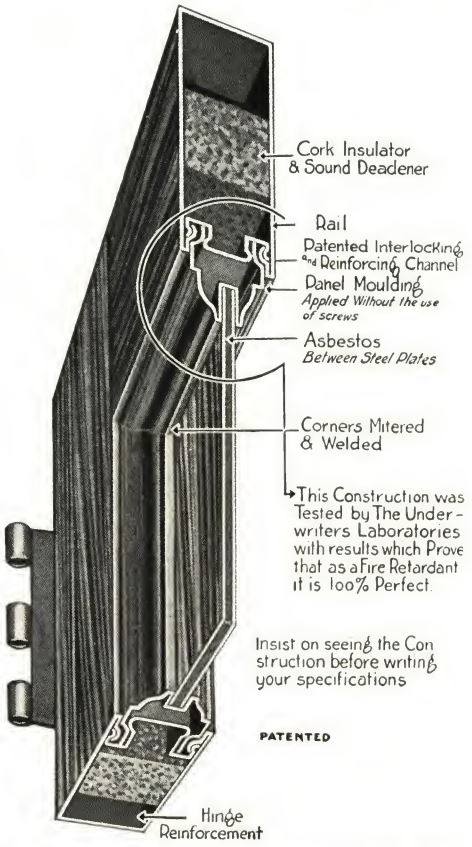
Casings—Made from cold rolled strip steel. All casing corners and miters are neatly welded and ground off to insure invisible joints. Casings are applied to frame with concealed clips.

Transom Sash—Constructed of No. 18 U.S. gauge steel similar to doors and properly reinforced for all necessary hardware.

Rough Bucks—Made from No. 14 U.S. gauge steel. Intersecting joints are accurately welded, adjustable crimped or corrugated anchors will be provided with rough bucks for building in wall. Bucks will receive dip coat of paint before shipment.

Unit Frame—(Combining buck, jamb and casing in one.) Made from No. 12, 14 or 16 U.S. gauge steel of the same quality as described for doors. Combination frames are notched and reinforced for hardware. The frames will receive a baked-on prime coat. The finishing coats to be applied at building by painting contractor.

Finish—After fabrication, doors receive a dip coat of rust resisting enamel, the inside of panels are painted before being assembled, the dip coat is baked on and a filler is then applied over all uneven surfaces and baked. The filler coat is ground and sanded perfectly smooth. Two coats of high grade mineral paint are then applied, each baked on separately. All grained finishes receive two coats of best baking varnish—each coat is baked. All finished work is rubbed to an egg-shell gloss.



Detail Showing Construction of U.M.P. Door

Jambs, casing and mouldings are finished in the same manner as the doors.

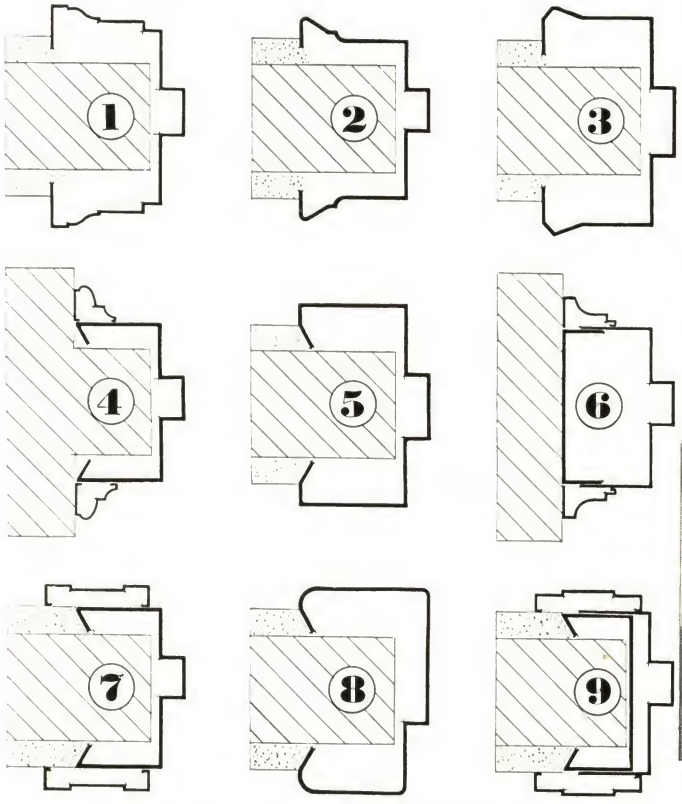
Hardware—Applied to doors at factory before shipment, except where crating of materials might be interfered with. Drilling and tapping for such items as door and transom closers are done at the building by the erector after materials are installed.

Underwriters' Labels—The standard U.M.P. construction has been tested and listed by the Underwriters' Laboratories, Inc., and we have been granted the privilege of applying the Underwriters' label to doors for corridor, room partition and fire escape openings.

Fire wall doors to receive Class "A" labels can be furnished in hollow metal construction. Doors may be made from No. 18 U.S. gauge steel and the design may be of one or more panels to match surrounding work. Frames may be of the unit type not less than No. 14 U.S. gauge, or a No. 10 gauge rough buck only be used, together with a cabinet jamb No. 16 U.S. gauge. Frames must be of the built-in type.

Underwriters' labels can be furnished for fire wall, vertical shaft, fire escape and partition openings up to 4 ft. wide, 8 ft. high for single doors, and 8 ft. wide 8 ft. high for pairs of doors.

Glass is not permitted in labeled fire wall or vertical shaft doors.



Details of U.M.P. Standard Buck and Jamb Construction

No. 1—Combination frame, No. 16 gauge rolled type.

Nos. 2, 3, 5, 8—Combination frame, No. 14 gauge formed type.

No. 4—Combination frame No. 14 or 16 gauge with applied scribe moulds.

No. 6—Rough inverted buck with cabinet jamb and applied scribes.

No. 7—Combination frame No. 14 or 16 gauge with separate applied casings.

No. 9—Rough buck No. 12 or 14 gauge with cabinet jamb and separate applied casings.

No. 1 frame is suitable for 3 and 6-in. rough tile walls; all other frames are suitable for walls of varying thickness

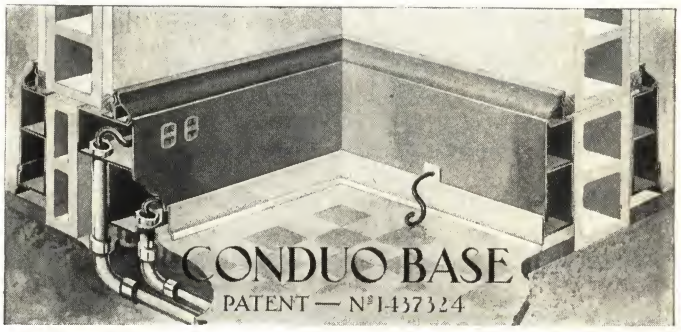
Stainless Steel Specialists

Empire State, the world's tallest building, owes much of its spectacular effect to the glittering ribbons of stainless metal which run from bottom to top of this colossal structure. More than 300 tons of stainless steel were used in the vertical pilasters. These strips, more than 20 miles of them in all, were fabricated complete by THE UNITED METAL PRODUCTS COMPANY. Our special facilities and broad experience in the handling of stainless metals enabled us to keep well ahead of construction progress on this building, although it went up at the rate of a story a day. Performance like this on many stainless jobs has earned for United an enviable reputation as stainless steel specialists

Empire State Building
SHREVE, LAMB & HARMON, Architects
STARRET BROS. & EKEN, INC., Builders

Conduo Base

Combining base and wire conduit. United Metal Conduo Base is a combination base and distribution system for telephone, light and power wires. The use of U.M.P. Conduo Base eliminates the necessity of an expensive underfloor conduit system where tenant requirements cannot be predetermined.



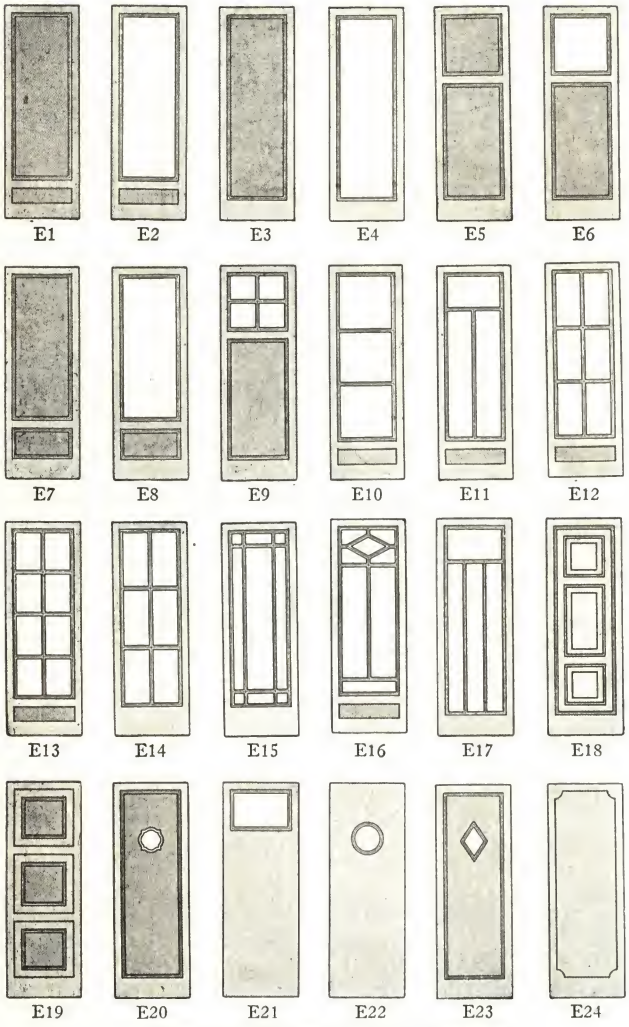
If provision is made for the use of Conduo Base on exterior walls, all wires can later be distributed from this to the Conduo Base on subdividing partition walls or metal partition, and outlets for telephones, desk lamps, adding machines, etc., can then be had in any location in the room where required by the tenant.

For further information regarding the use of Conduo Base please write or wire THE UNITED METAL PRODUCTS COMPANY.

Elevator Enclosures

The basic construction of United Elevator Doors is similar to that of the swing doors described in detail on the preceding pages.

Special heavy reinforcing is used to compensate for the added stresses involved in power operation. Any required design can be furnished in door thicknesses of 1⅛, 1¼, and 1½ in. 1¼-in. doors are considered standard. United Doors are furnished in bronze or in steel, finished in solid colors or grained to simulate any natural wood.



Standard Elevator Door Designs

Underwriters' Labels—The importance of elevator enclosures as fire-stops has led to wide use of Underwriters' Labeled construction and to a very high degree of specialization on this grade of enclosure. United Metal has been a pioneer in this field and has been responsible for several important innovations in design. Progress along this line has now reached a point where virtually any type of United Elevator Enclosure, except those in which glass is used, can be furnished with the label of the Underwriters' Laboratories. This certified construction covers doors, frames, sills and hardware, providing complete fire protection at highly vulnerable points.

It is a matter of common knowledge that the only ready avenues for fire in the modern, slow-burning type of building are the elevator shafts, which are all too frequently inadequately protected and function as chimneys in a blaze of any size. In any building which is heavily occupied it is vital that all elevator openings be protected by steel construction which has been tested and guaranteed to afford a definite degree of protection. The mere fact that steel is the material used is not enough. Interlocking members of United Doors and Frames are so designed that they positively prevent the passage of fire and smoke, yet they do not detract in any way from the finished appearance of the enclosure. Safety is secured at no sacrifice of beauty.

Insurance companies take cognizance of the fact that fires confined to the floor upon which they originate seldom assume serious proportions. The security provided by United Underwriters' Labeled Enclosures is reflected in correspondingly lower insurance rates. A simple calculation will develop that this type of construction pays for itself completely in relatively few years time, since there are no upkeep costs involved and no materials of a perishable nature included in the design.

Another Fire-safe Specialty—Among many other fire-safe specialties, United has developed a special type of elevator enclosure for use in connection with swinging doors to push button elevators. The door, frame and sill all finish flush on the hatch side and a steel facia plate is provided to fill the space between the top of the door and the sill above, presenting a solid barrier to fire when the door is closed.

One of the principal purposes of this new development is to guard against accidents which sometimes result on this type of elevator from the projection of the door frame and sill into the finished shaft.

Specifications and details covering United Flush Hatch construction for swinging doors to push button elevators will be furnished upon request.

Hollow Metal Partitions

The U.M.P. Standard Hollow Metal Partition is made entirely from the best quality of cold rolled furniture stock steel. The panel sections are welded together in varying widths to fit any floor or room layout.

The base, cornice and mullion members are specially designed for the reception of telephone and light wires.

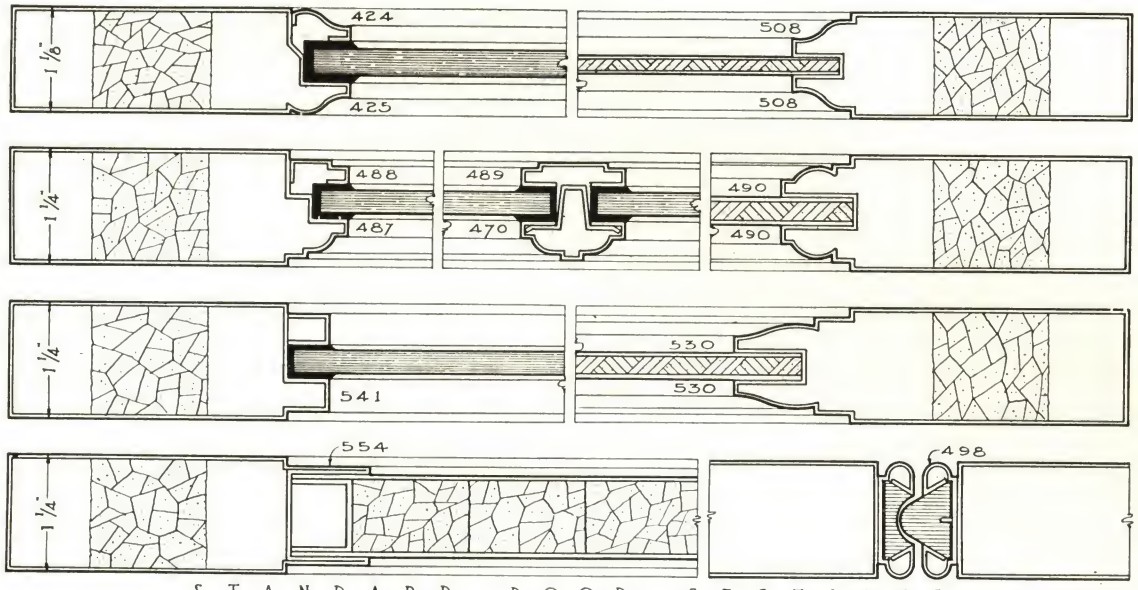
The U.M.P. Office Partition is interchangeable, and can be adapted to varying conditions without damage to floors, walls or surrounding work.

Engineering Service

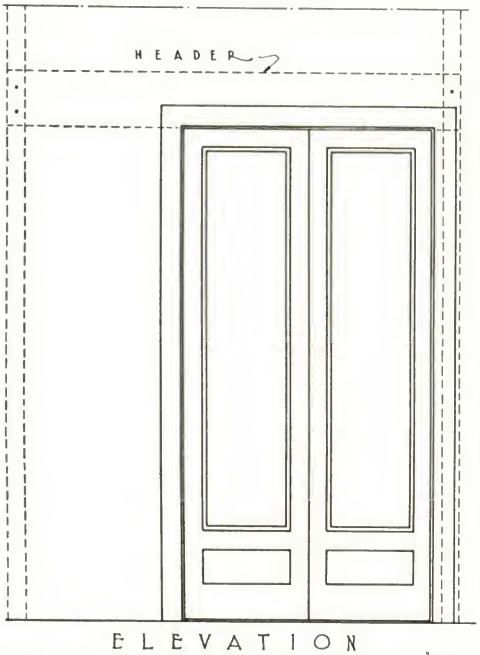
Back of the entire line of United Hollow Metal Doors and Trim is United engineering service.

Architects have had good reason to be suspicious of many offers of service of this kind. In a regrettably large number of cases it proved to be either inadequate or unsound, or both. In the United organization it is the guiding factor back of the whole operating plan.

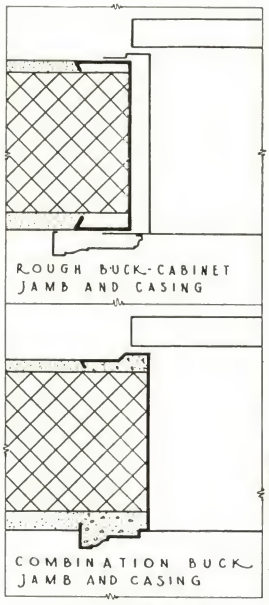
United engineers have to their credit many of the largest as well as the most unusual and difficult hollow metal installations in this country. Since new problems are always arising it is essential that an engineering staff keep an open mind and be prepared to co-operate to the fullest extent to carry out the architect's ideas. We believe this state of mind will be found to exist in our organization to a degree that will make United service a welcome innovation to many architects.



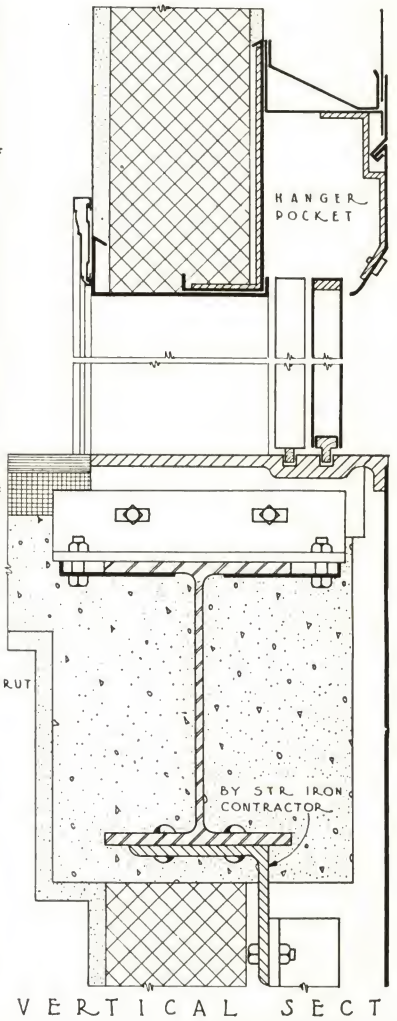
STANDARD DOOR SECTIONS



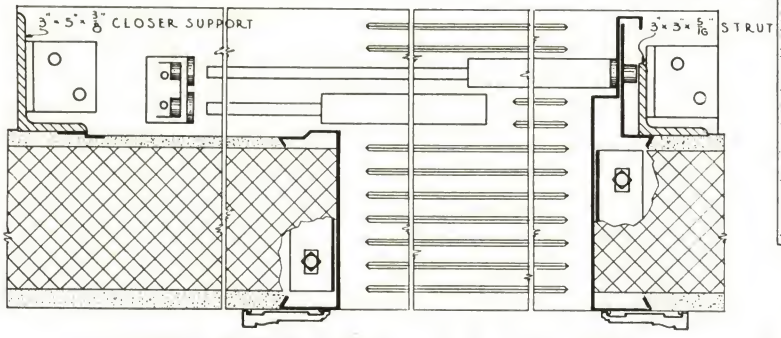
ELEVATION



ALTERNATE JAMB SECTIONS



VERTICAL SECT



HORIZONTAL SECTION

STANDARD DETAIL OF A
TWO SPEED ELEVATOR ENCLOSURE
THE UNITED METAL PRODUCTS CO

KALMAN STEEL CORPORATION

SUBSIDIARY OF BETHLEHEM STEEL CORPORATION

Manufacturers of Steel Door Frames

GENERAL OFFICES

BETHLEHEM, PA.

For Other Offices, see our page on Concrete Reinforcement

Products

STEEL BUCK; STEEL BUCK AND JAMB; KALMANTRIM.

Also other related products.

For Concrete Reinforcement, and Steel Joists, see Manufacturers' Index.

Kalman Steel Buck

The new Kalman Steel Buck replaces wood rough buck, ground and standing trim in constructing interior or exterior door, plaster jamb, and borrowed light openings.

The Kalman Steel Buck has been perfected by the KALMAN STEEL CORPORATION for use with clay, gypsum tile or solid plaster partitions, or in brick and masonry walls, and it has many definite advantages when used with wood stud walls and metal lath.

(1) It provides a heavy galvanized steel member in place of the usual wood buck.

(2) It eliminates plaster cracks caused by warping of the wood buck.

(3) It provides a steel lintel, eliminating plaster cracks due to shrinkage.

(4) It provides a superior construction at no increase in cost.

(5) It eliminates wood grounds and provides a positive finish and edge for the plaster.

(6) It provides positive anchorage between buck and wall.

(7) It permits of the elimination of standing trim.

(8) It eliminates the necessity for patching and pointing of plaster.

(9) It eliminates unsightly split casings.

(10) It increases wall space.

(11) It reduces maintenance cost.

(12) It reduces fire hazard.

(13) It eliminates dust catchers.

(14) It permits architectural flexibility and harmony.

(15) It can be erected quickly and easily.

(16) It adds years of life to a building.

Kalman Steel Buck and Jamb

The new Kalman Steel Buck and Jamb has certain advantages because of its unusual design.

(1) The sides of the frame closely engage the wall tile.

(2) It provides perfect plaster grounds.

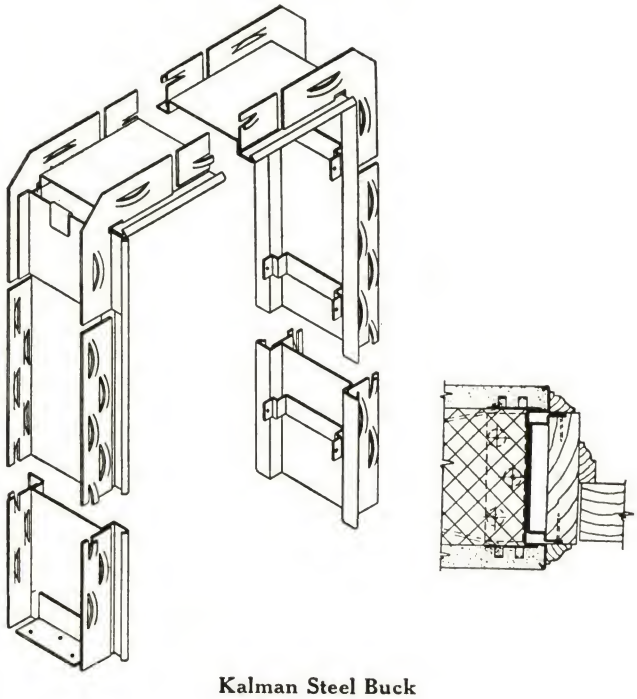
(3) It provides surface attachment and reinforcement for plaster through rows of loops.

(4) Where initial corrosion is objectionable, the surface is galvanized.

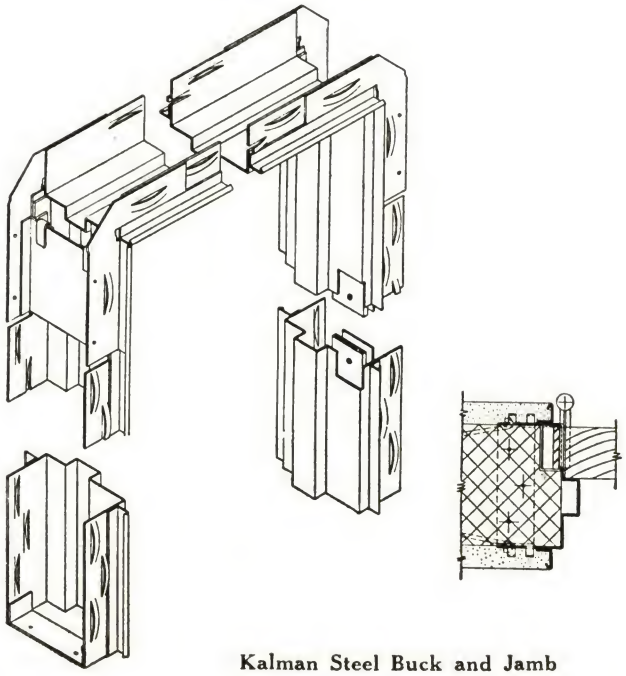
(5) Wall anchors can be attached at any point.

(6) It is simple in design, possesses character as steel instead of an imitation of wood and is in keeping with the modern trend in architecture.

In addition, the Kalman Steel Buck and Jamb offers all the advantages listed for the Kalman Steel Buck.



Kalman Steel Buck



Kalman Steel Buck and Jamb

COBURN TROLLEY TRACK MFG. CO.

Metal Covered Doors, Windows and Finish, Steel Bucks and Trim

HOLYOKE, MASS.

BRANCHES IN ALL PRINCIPAL CITIES

Products

METAL COVERED DOORS with photographic graining to match wood doors; STEEL BUCKS, FRAMES and TRIM.

Also Metal Covered Double Hung Windows both with and without integral weatherstripping; Bronze and Copper Entrances; Metal Covered Dumbwaiter Units of all types; Elevator Enclosures, including sills and hardware complete; Tin Clad Fire Doors and Shutters with hardware; Folding Partitions.

For Coburn Sliding Door Hardware of all types, see Manufacturers' Index.

Facilities and Shipping

This company is prepared to handle orders of any size for all parts of the country. A large modern plant, with direct rail connection, insures the fabrication and delivery of all work promptly and in a satisfactory manner.

Metal Covered Doors and Trim

Coburn metal covered doors are furnished both labeled and unlabeled for use in office buildings, hospitals, public buildings, hotels, theaters, stores, residences, etc. These include stair, elevator, fire escape, tower, corridor and partition doors for general interior work, and entrance doors in copper, bronze, and brass.

Coburn standard doors are made with kiln dried white pine cores; rails are tenoned into stiles; panels are grooved into stiles and rails. Cores are covered with kalamein or galvanized iron, bronze, copper or brass.

For standard details and application of labeled and unlabeled doors showing mouldings and panels, see details on following page.

Underwriters' Labeled Kalamein Doors

Coburn underwriters' labeled kalamein doors when installed as specified below for the purposes indicated, will give maximum protection and procure minimum rates for the insuring of the building and its contents.

Standard Stair and Elevator Doors—Labeled for single doors up to 48 in. wide and in pairs up to 96 in. wide. Panels to be solid. Hung on angle iron frames for brick walls and channel frames for tile walls or for metal lath and plaster partitions, with strap hinges and latches or butts and lock sets. Doors to stairs should be made self-closing. Doors can not be hung on metal covered jambs.

Fire Escape and Tower Doors—Labeled for single doors up to 4 ft. wide, 10 ft. high and for pairs up to 8 ft. wide, 10 ft. high; can include glass panels not exceeding 720 sq. ft. in area. Must be hung in the same manner as stair and elevator doors.

Corridor and Partition Doors—Labeled to receive 9 sq. ft. of wire glass. Labeled up to 4 ft. wide, 10 ft. high for single doors and 8 ft. wide, 10 ft. high for pairs.

Specifications for Kalamein and Metal Covered Work

The following specifications are applied to the manufacture of all Coburn metal covered work and comply strictly with the most approved methods of construction for labeled and unlabeled doors and trim.

Cores—All woodwork used in the manufacture of doors and window frames, jambs, doors, sash and trim to be seasoned, clear, kiln dried white pine. Stiles more than 6 in. wide to be built up of strips glued together. All door and sash members to be mortised and tenoned together.

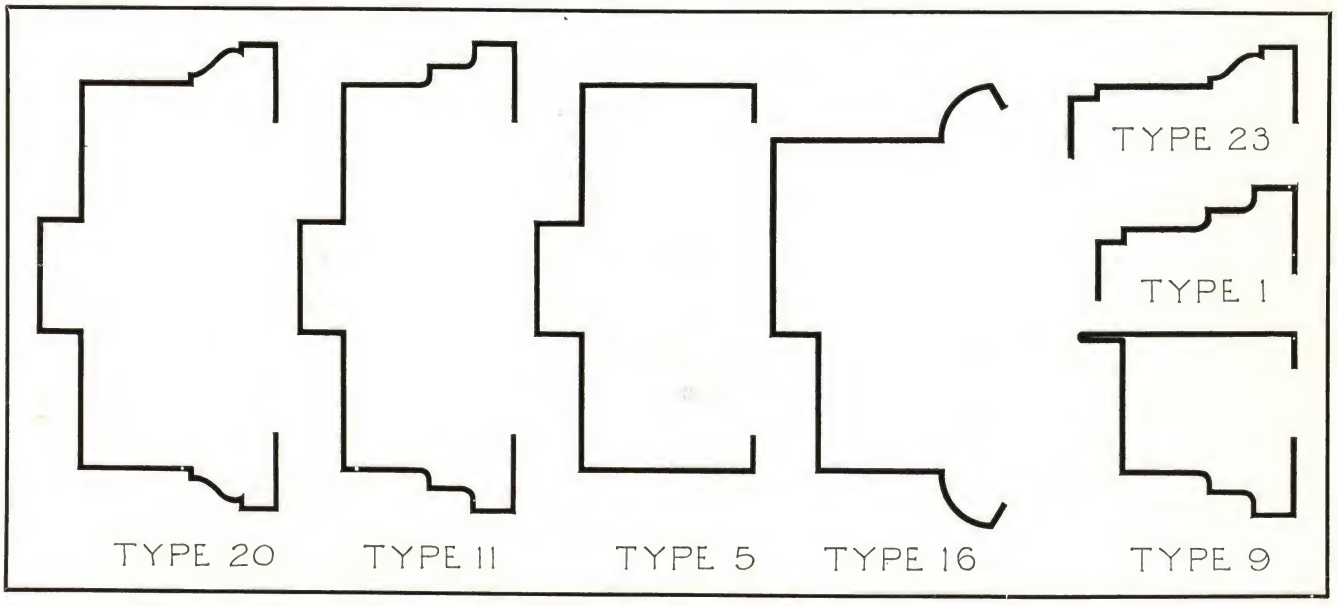
Trim—Trim for doors to be shipped knocked down and fitted in the field so that any irregularities may be taken up at the job.

Metal—All metal covering of galvanized iron, furniture steel or kalamein to be of gauges ranging from 18 to 26; copper to be from 16 to 32 oz.; bronze from gauges 16 to 24. Metal to be drawn on to wood cores through steel dies. Furniture steel or kalamein can be painted in color or grained to match any type of wood door; copper and bronze to be finished antique, statuary bronze or any suitable design as required.

Covering of Cores—***Unlabeled Doors***—The metal is to be applied directly over the cores. All metal must fit closely to the wood cores. All surfaces and edges are to be straight and true; mouldings to be as per details. Bench marks are to be avoided as much as possible and cut ends at miters are to be covered with the same metal as used on mouldings. Thickness of door is 1¾ in.

Labeled Doors—Are to be covered in the same manner as the unlabeled doors except as shown on detail on following page. Thickness of door is 1⅞ in.

All joints of metal to be locked and soldered so that no moisture can gain entrance to the cores.



Coburn Combination Pressed Steel Frames

E. H. FRIEDRICH COMPANY

Manufacturers of Metal Covered Doors, Windows, Partitions and Trim

HOLYOKE, MASS.

REPRESENTATIVES

ALBANY, N. Y., United Roofing Co., 425 Orange Street
BALTIMORE, MD., Consolidated Supply Co., 1102 No. Charles Street
BOSTON, MASS., Rubin Burke Co., 333 Washington Street
NEW HAVEN, CONN., A. R. Kirschner Co., 30 Whitney Avenue
NEWPORT, KY., Utility Steel Equipment Co., P. O. Box 244
PHILADELPHIA, PA., M. O. Sundelius, 816 Otis Building
SCRANTON, PA., LeBar, Evans & Allen, 711 Linden Street
UTICA, N. Y., American Hardwall Plaster Co.
WASHINGTON, D. C., Consolidated Supply Co., Bond Building

Products

HIGH GRADE METAL COVERED WOOD DOORS, FRAMES and TRIM, METAL COVERED DOUBLE HUNG WINDOWS, PARTITIONS, ENTRANCES, etc., furnished in Kalamein Iron, Steel, Copper and Bronze.

Kalamein and Tin Clad Fire Doors furnished with Underwriters' label when required.

FIREPROOF HOLLOW METAL WINDOWS with Underwriters' label.

TRADE-MARK

Facilities and Workmanship

Our factory is especially well equipped to produce any design in metal covered work, such as is used for bank entrances, office buildings and schools.

This work is done by craftsmen well skilled in their trade who are capable of producing finished material to suit any architectural condition relative to design and exacting workmanship.

FRIEDRICH CONSTRUCTION SPECIFICATIONS

Metal Covered Work

Wood Cores—The cores of all metal covered work are made up from clear kiln-dried white pine, free from large or loose knots, sap and dry rot.

All cores are milled true to form through moulding machines.

When stiles and rails are more than 6 ins. wide, they are made of strips glued together with waterproof glue.

Metal Covering—All woodwork is covered by drawing through steel dies.

Panels are of composition, wood or asbestos and are covered by gluing metal to surface under pressure.

Metal covering may be kalamein iron, furniture steel, copper or bronze.

Kalamein iron or furniture steel can be furnished in gauges from 28 to 20; copper from 14 to 48 oz., and bronze from 24 to 16 gauge.

Unless otherwise specified, standard manufacture is based on 26-gauge kalamein iron; 24-gauge furniture steel; 16-oz. copper and 20-gauge bronze.

Assembly—All doors are assembled with mortice and tenon joints glued together and nailed.

All joints between metal are soldered flush and scraped smooth, making an even surface throughout.

Joints in bronze doors are made by locking the metal and sweating to a plate fastened on the wood core, making a hairline joint when finished.

A Friedrich Metal Covered Door

Muntin bars are completely covered with metal, and all coped to fit contour of moulding and joints soldered and scraped smooth.

Finish—Copper cleaned and oiled, or oxidized when specified.

Bronze cleaned and oiled or finished statuary.

All kalamein material is furnished with a prime coat of paint.

Hollow Metal Windows

A complete line of all types of hollow metal windows, Underwriters' labeled, is manufactured by this company.

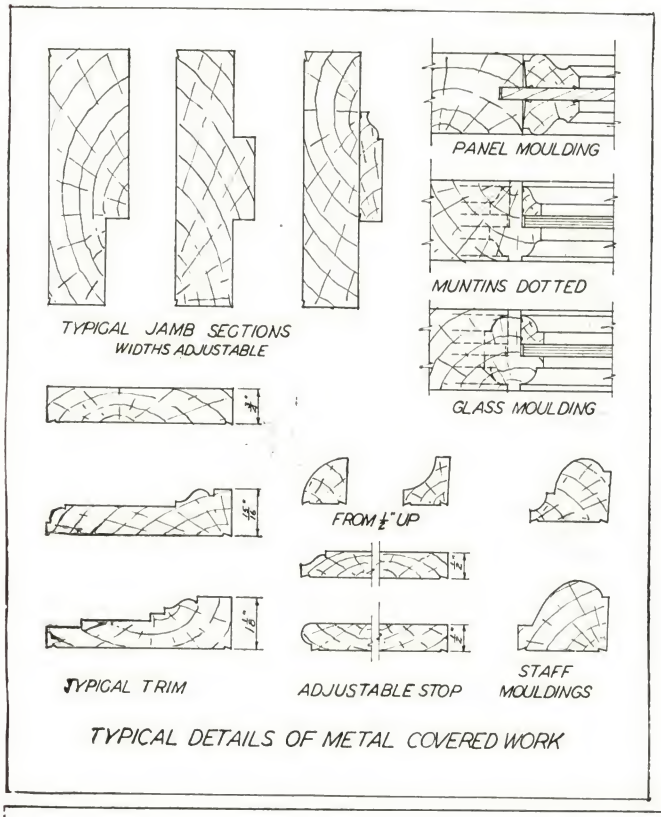
This includes double hung, stationary, pivoted and combinations of these types.

All windows are made with cutting and forming dies which insure the fitting of every member when assembled and a perfect operating window. Made in standard 24-gauge, also heavy type 20-gauge.

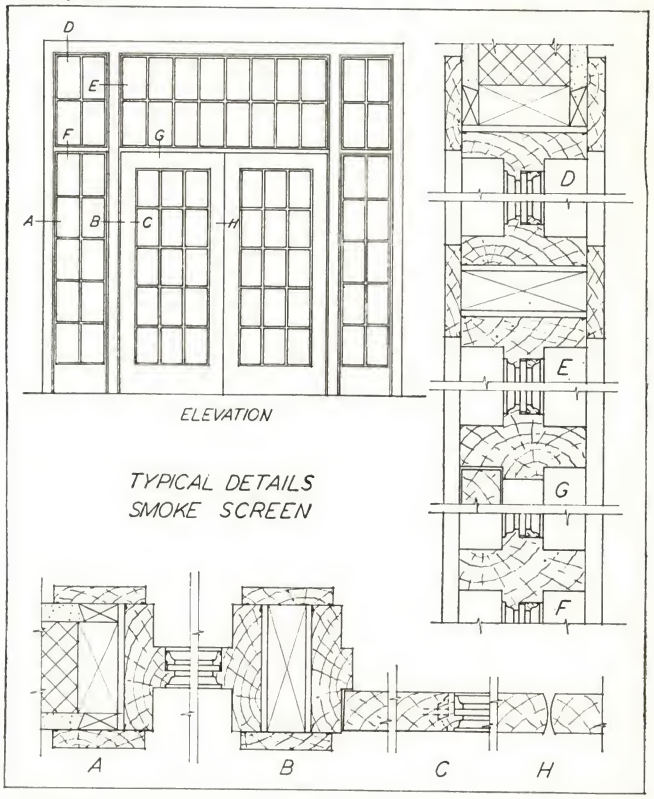
Specifications and details sent on request.

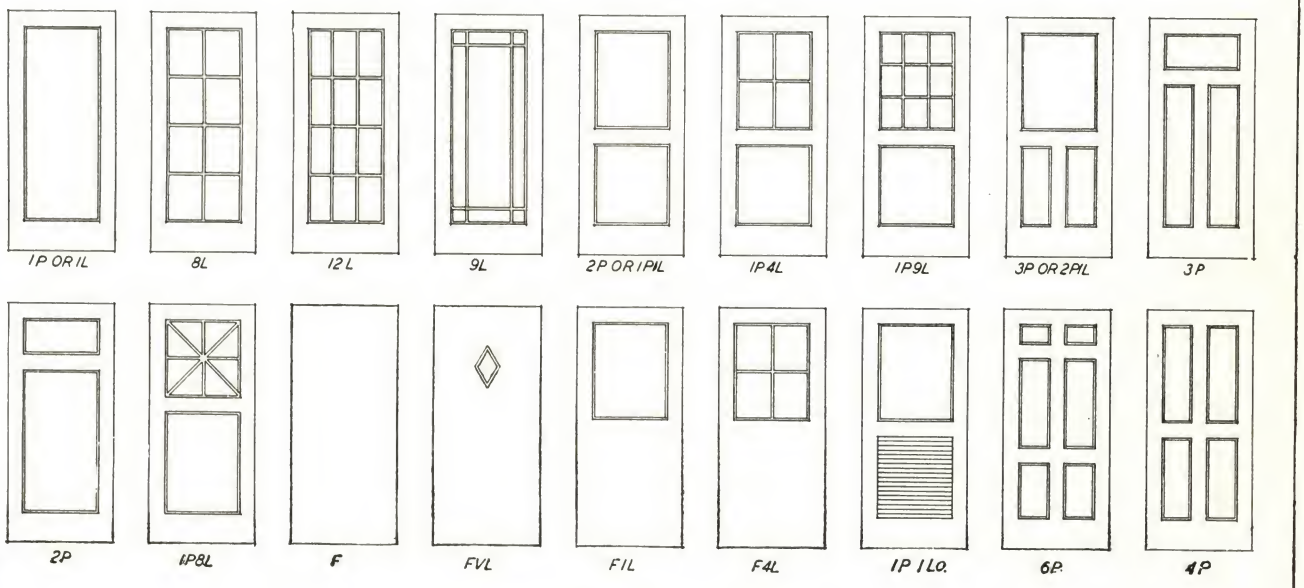
A FEW RECENT CONTRACTS

Building	Architect
Deerfield Academy, Deerfield, Mass.	Chas. A. Platt
Addison Gallery of Art, Andover, Mass.	Chas. A. Platt
Albany Boys Academy, Albany, N. Y.	Marcus C. Reynolds
Sterling Hall of Medicine, New Haven, Conn.	Chas. Z. Klauder
Clarksdale Bank, Clarksdale, Miss.	Hanker & Cairns
Polytechnic Institute, Baltimore, Md.	Chas. M. Anderson
Mt. Pleasant High School, Schenectady, N. Y.	R. L. Bowan
Vanderbilt Hall, Harvard University	Coolidge, Shepley, Bulfinch & Abbott
Quadrangles Yale University, New Haven, Conn.	James Gamble Rogers
Horace Mann School, Washington, D. C.	A. L. Harris
N. E. Medical Center, Boston, Mass.	Andrews, Jones, Biscoe & Whittemore
Bowdoin Sq. Telephone Exchange, Boston, Mass.	Densmore, LeClear & Robbins
Telephone Exchange, Torrington, Conn.	R. W. Foote
Daniel Butler School, Belmont, Mass.	Bigelow, Wadsworth, Hubbard & Smith
St. Pauls English Lutheran Church, Washington, D. C.	Frohman, Robb & Little
Gridley Bryant School, Quincy, Mass.	Harper & West
Fire Alarm Headquarters, Waltham, Mass.	Chas. G. Loring
Taunton High School, Taunton, Mass.	Joseph I. Higgins
Nurses Home, City Hospital, Baltimore, Md.	Palmer & Lamdin
Folger Shakespeare Library, Washington, D. C.	Paul P. Cret
High School Addition, West Pittston, Pa.	Mack & Sahm
City National Bank & Trust Co., Danbury, Conn.	Morgan, French & Co.
Jackson Memorial Hospital, Boston, Mass.	Stevens & Lee
East Baltimore Colored Jr. High School, Baltimore, Md.	Taylor & Fisher
Vernon Pumping Station, Baltimore, Md.	Baltimore Bureau Mech. Elec. Service
Van Sickle School, Springfield, Mass.	E. C. & G. C. Gardner
So. New England Telephone Exchange, Hartford, Conn.	R. W. Foote
Administration Bldg., Dept. of Education, Baltimore, Md.	Lucius R. White, Jr.



TYPICAL DETAILS OF METAL COVERED WORK





REPRESENTATIVE DOOR TYPES

THE R. C. MAHON COMPANY

Manufacturers of Kalamein and Tin Clad Doors

DETROIT, MICH.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

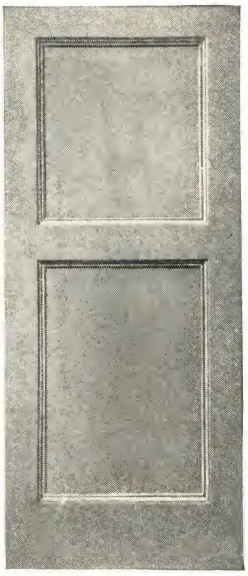
MAHON KALAMEIN and TIN CLAD DOORS; TRANSOMS, JAMBS, TRIM and MOULDING SECTIONS.

For Mahon Permanent Steel Floor Forms, Steel Roof Deck, Rolling Steel Doors and Cast Iron Roof Sumps, see Manufacturers' Index.

Mahon Kalamein Doors

Underwriters' Labeled Doors—Mahon Underwriters' Labeled Kalamein Doors are manufactured from the finest selected kiln-dried pine, covered with 24-gauge sheet steel. All joints are welded, making a sturdy, fire safe, fine appearing door.

Standard Kalamein Doors—Mahon Standard Kalamein Doors embody the same high quality materials and fine workmanship as Mahon Underwriters' Labeled Doors. These doors are manufactured for use in locations where quality fire doors are desirable when labeled doors are not specified.



Type 1 Kalamein Door

Standard Types and Sizes—Mahon Underwriters' Labeled and Standard Kalamein Doors are available in 12 distinctive designs in 16 standard sizes. These doors, with their sharp, clearly defined lines, are masterpieces of fine workmanship—fit companions for the finest materials that can go into any building.

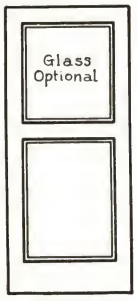
Service—Mahon designers are available and will co-operate on special conditions where standard size doors cannot be used.

Mahon Tin Clad Doors

THE R. C. MAHON COMPANY also manufactures tin clad doors (Underwriters' labeled) to meet every requirement.

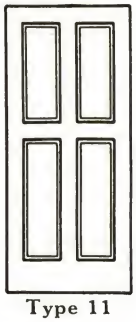
STANDARD SIZES—MAHON KALAMEIN DOORS

2′6″x6′ 6″	2′8″x6′ 6″	2′10″x6′ 6″	3′0″x6′ 6″
2′6″x6′ 8″	2′8″x6′ 8″	2′10″x6′ 8″	3′0″x6′ 8″
2′6″x6′10″	2′8″x6′10″	2′10″x6′10″	3′0″x6′10″
2′6″x7′ 0″	2′8″x7′ 0″	2′10″x7′ 0″	3′0″x7′ 0″



Type 1

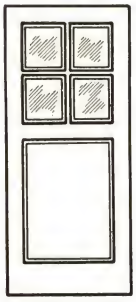
Type 2



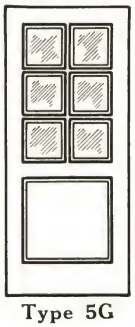
Type 11

Type 12

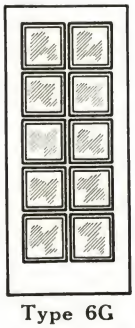
Type 3



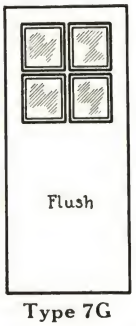
Type 4G



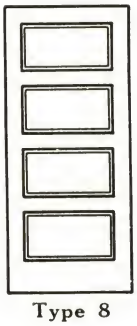
Type 5G



Type 6G



Type 7G



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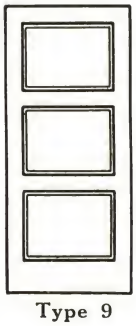
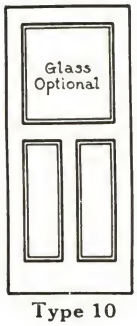


Type 9



Type 10

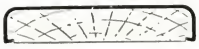
Standard Fireproofed Jambs, Trim and Moulding

Transoms, jambs and many attractively designed trim and moulding sections, manufactured from the same high quality materials and fireproofed in the same manner as Mahon Kalamein Doors, are carried in stock for immediate delivery.

No. 101

Standard 5½-in. Jamb

No. 200



No. 201

No. 203

Nos. 204 and 206

No. 205

Standard Trim Sections

No. 100

No. 101

No. 102

Standard Stop Sections

No. 300

No. 301

No. 305

No. 307

Nos. 309 and 308

No. 310

No. 311

Standard Moulding Sections

METAL CLAD DOORS, INC.

685 Concord Avenue, CAMBRIDGE, MASS.

Products

METCLA METAL COVERED DOORS, FRAMES, TRIM, ENTRANCES and WINDOWS; TIN CLAD FIRE DOORS and SHUTTERS.

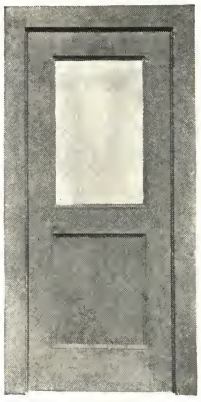
Kalamein and Tinclad Doors are furnished either with or without Underwriters' label.

Metcla Metal Covered Doors, Frames and Trim

Made by drawing sheet metal through steel dies over a wood core of white pine. This process practically welds the metal covering to its core, eliminates buckles and brings out all moulding members in clear relief.

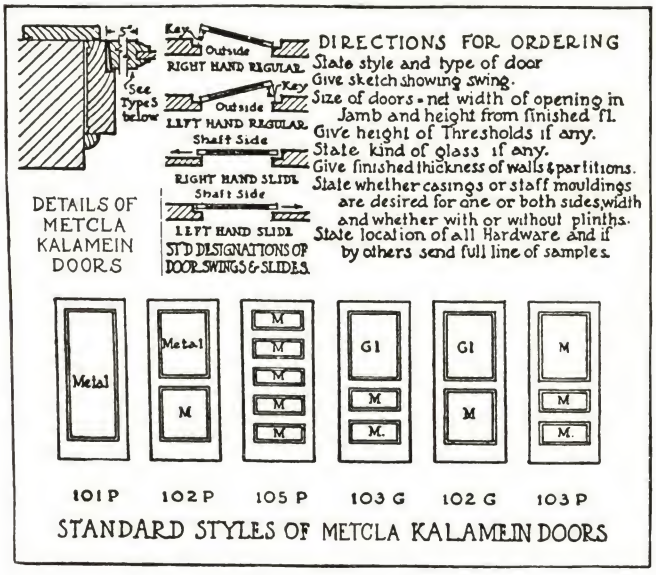
Made in kalamein iron, galvanized steel, copper or low brass; in sections, tongued, grooved and pinned together, and finished with a priming coat of paint. Glass is not furnished by us.

Standard styles in kalamein iron are illustrated below. Special styles and sizes will be furnished on short notice.



No. 102G
Metcla Metal
Covered Door

Metcla metal covered doors, frames and trim are approved by leading architects and engineers, and have been used under the most severe conditions. In specifying Metcla doors, frames and trim the architect is assured of the utmost in quality, workmanship and durability, upheld by continuous service and a high reputation for materials and workmanship.



Metcla Metal Covered Windows

The outstanding qualities of Metcla windows are their simple construction, ease of operation, fire retarding qualities, and the unusually high standard maintained in regard to the materials used in their construction.

They combine safety, economy, durability and weatherproofness.

Made for all classes of buildings in all required types and sizes, either from our own or architects' details and to conform with special requirements.

Furnished glazed or unglazed, with or without hardware, as required.

Metcla Metal Covered Entrances of Copper, Bronze or Kalamein

Metcla entrances are made in accordance with the architect's details to meet every requirement. They are a striking feature of many prominent public and private buildings and have all the advantages and the appearance of cast metal doors, without their extreme weight or cost.

Mill Entrance
Metcla Copper Kalamein

Metcla Kalamein Elevator Fronts

Metcla kalamein elevator fronts are specified for durability, ease of operation and appearance, where sheet steel doors are not desired, or where hollow metal doors would be too expensive.

Tin Clad Doors and Shutters

These are made in any style and size, and are furnished with or without hardware f.o.b. Boston or installed with or without Underwriters' labels.

Storage Warehouse Equipment
Tin Clad Doors, Iron Frames, Special Hardware

THE MOESCHL-EDWARDS CORRUGATING CO., INC.

Manufacturers of Kalamein and Tin Clad Doors

CINCINNATI, OHIO

Products

"Mecco" Kalamein and Tin Clad Doors; Jambs, Trim, Transoms and Moulding Sections.

For "Mecco" Rolling Steel Doors, see Manufacturers' Index.

TRADE-MARK

Facilities

A long established firm with a modern plant and ample facilities to execute orders of any size, for high grade metal covered woodwork in steel, copper or bronze. Also hollow metal frames, kalamein trim and moulding.

Labeled Products

Kalamein doors are Underwriters' labeled for all except Class "A" openings. Frames to be labeled must be hollow metal. Mecco labeled doors and frames will give you the best possible rating obtainable. A circular giving complete details will be mailed upon request.

Specifications for Underwriters' Labeled Kalamein Doors

Where specified or marked "Kalamein Doors" same shall be metal covered with wood cores and labeled by the National Board of Underwriters and all to be as manufactured by The Moeschl-Edwards Corrugating Co., Inc., of Cincinnati, Ohio.

The cores shall be built of non-resinous wood assembled with mortise and tenon joints. Panels to be ¼-in. thick formed of asbestos mill board and two thicknesses of 24 gauge galvanized steel. Covering for rails and styles shall be not less than 24 gauge galvanized steel so applied as to fit the cores snugly and edges of covering to be riveted through the panels, all in neat and workmanlike manner.

Where styles and rails meet, they shall be joined by a lock joint. Panel molds are to be of wood core, drawn metal construction with members sharp and true. Glass molds to be of drawn hollow metal, joined as approved by the Underwriters. Doors shall receive one prime coat of paint at the factory.

STOCK DOORS—STANDARD SIZES ALWAYS IN STOCK

All Dimensions in Ft. and In.

Type E	Type B	Type C
2–6x6–0; 2–6x6–6 2–8x6–8; 3–0x7–0	..... 2–8x6–8; 3–0x7–0	..... 2–8x6–8; 3–0x7–0

Construction and Materials

"Mecco" Kalamein products are manufactured of only high grade materials throughout. Construction used is that proven by time and experience to be the best for every condition. Wood work is kiln dried and only stretcher leveled sheets of proper gauges are used.

Specifications for Commercial Non-labeled Kalamein Doors

Where specified or marked "Kalamein Doors" same shall be metal covered with wood cores, as manufactured by The Moeschl-Edwards Corrugating Co., Inc., of Cincinnati, Ohio.

Cores shall be of non-resinous wood with mortise and tenon joints, thoroughly glued and nailed.

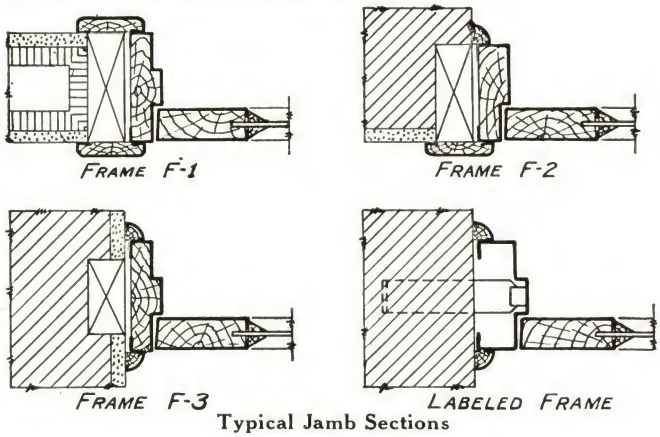
Covering shall not be less than No. 25 gauge stretcher leveled kalamein iron for interior doors and No. 24 gauge galvanized steel for exterior doors, so applied as to fit the cores snugly, in the most approved and workmanlike manner.

Panel and glass mould must have wood cores with metal covering drawn tightly on by means of steel dies. All members must be sharp and true; no pressed moulds will be permitted.

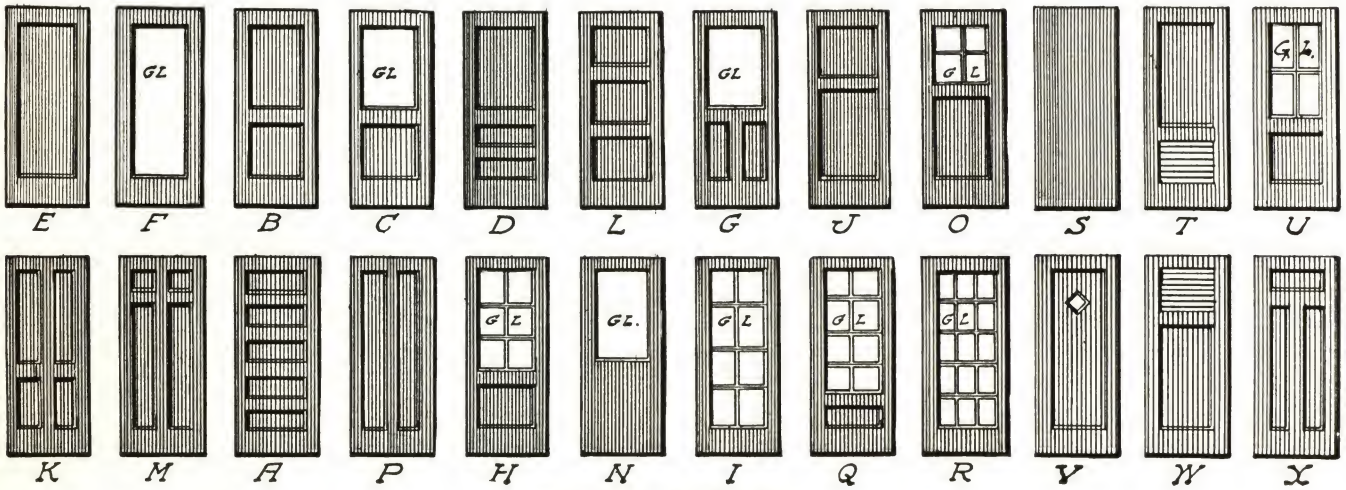
Doors must receive one prime coat of paint at the factory.

Frames, casing and staff moulds for these doors, where required, are also to be wood core, metal covered of equal workmanship.

Hardware is furnished by others, but must be mortised for by the door manufacturer at the factory.



Typical Jamb Sections



Suggestions for Paneling

NEW YORK KALAMEIN CO.

Manufacturers of Metal Covered Wood Work

800 Humboldt Street, BROOKLYN, N. Y.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

DRAWN METAL COVERED WOOD DOORS, WINDOWS, ELEVATOR FRONTS, PARTITIONS and TRIM in Steel, Copper and Bronze.

NEW YORK KALAMEIN COMPANY

TRADE-MARK

Sound Construction

In the manufacture of our products we follow old established methods, which have been found through long use to be the most satisfactory. Doors are of mortise and tenon construction. No dowels or corrugated fasteners are used. No parts are covered by hand, the doors are strictly a machine made product.

All parts of doors, windows and trim are separately kalameined before assembly. This not only produces the highest class of work, but places us in a position to render a very wide service to users of all classes of metal covered woodwork.

Specification Data for Standard Metal Covered Doors

Cores' Stiles and Rails—Wood used in cores, stiles and rails is sound, kiln dried white pine, milled solid, and free from large and loose knots and sap.

Covering—All parts are covered with 24-gauge furniture steel, 24-gauge terne plate or 26-gauge galvanized iron by die process before assembly.

If doors are to be covered with copper, 16 oz. is recommended; if bronze is used, 20 gauge is recommended.

Panels—Panels are built up as in veneer process, under pressure of two sheets of metal, cemented on to approved board.

Assembly—Stiles are mortised and rails blind tenoned. Panel is inset into stiles and rails. Surface seams are soldered and scraped smooth. The top and bottom edge seams have underlaid strips of metal making the joints practically waterproof.

Painting—All material is given a priming coat of paint before leaving the factory.

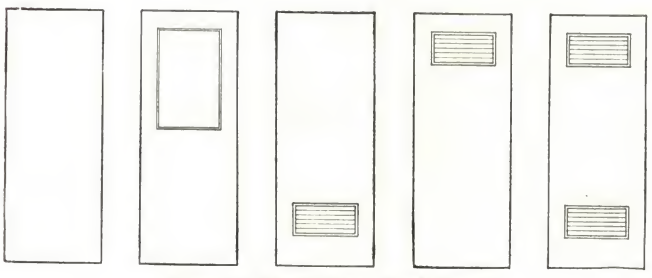
Steel Veneer Flush Doors

Architects who are planning to use hardwood flush veneer doors will be interested in receiving information concerning our steel veneer flush doors.

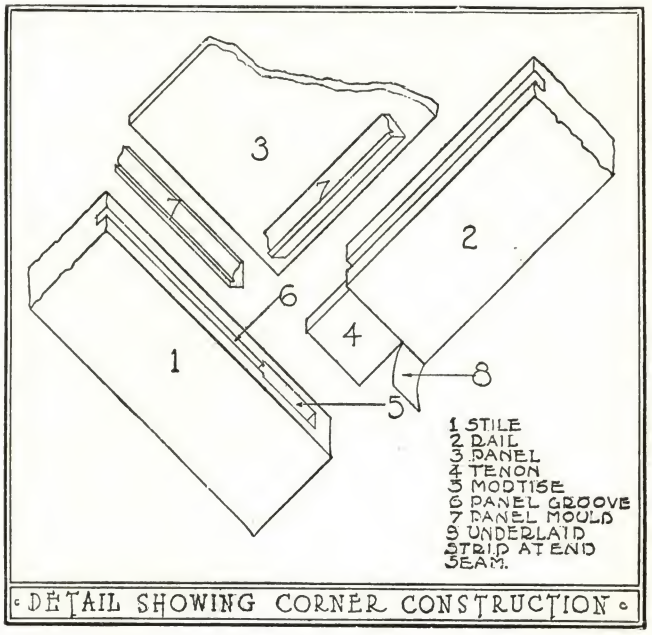
These doors sell at a lower price than wood—are thoroughly fire retardant.

Doors are covered with 22-gauge furniture steel, by a special process, and can be had in an enameled finish and a variety of colors.

We respectfully call the attention of the architectural profession to the types of steel veneer flush doors shown here.



Types of Steel Veneer Flush Doors



DETAIL SHOWING CORNER CONSTRUCTION

Metal Covered Windows

Metal covered windows of double hung or casement type can be furnished in our own standard designs, or we will build them to specifications. Other types of windows will be manufactured to meet special conditions. All windows are of sturdy construction. Special care is taken to have the joints and seams tight to withstand the action of the weather.

Service

We are prepared to design special metal covered woodwork to fit openings with unusual contours. Upon receipt of drawings or sketches we will be glad to submit for approval designs for filling any shape or size window opening.

Some Recent Installations

New York Central Office Building, New York, N. Y.; James Stewart & Co., Inc., Contractors; Warren & Wetmore, Architects

Vincent Astor Residence, New York, N. Y., Saxton-Gerard Co., Inc., Contractors; Mott B. Schmidt, Architect

Apartment House, 79 E. 79th Street, New York, N. Y., James Stewart & Co., Inc., Contractors; Electus Litchfield, Architect

Edison Substation, West 72nd Street, New York, N. Y., Saxton-Gerard Co., Inc., Contractors; W. Whitehill, Architect

Edison Substation West 124th Street, New York, N. Y., Ken-Well Contracting Co., Contractors; W. Whitehill, Architect

Hillsboro High School, Tampa, Fla., J. L. Crouse, Contractor; Francis J. Kennard & Son, Architect

W. F. OVERLY & SONS

Overly Metal Covered Doors

GREENSBURG, PA.

Products

LABELED and NON-LABELED METAL COVERED DOORS.

Also manufacturers of Special Architectural Sheet Metal Products, including Cornices, Roof Ventilators, Gutters and Conductors.

For Goodwin Automatic Stage Ventilator, Puttyless Skylights, and Marquees, see Manufacturers' Index.

Overly Metal Covered Doors

An unusually high standard is maintained in the manufacture of Overly Metal Covered Doors. They are specified by leading architects and approved by prominent engineers and builders.

Facilities

The plant of W. F. OVERLY & SONS is fully equipped with modern machinery and devices to meet the most exacting requirements combined with quantity production. The men employed are craftsmen in the field of metal door production, men accustomed to executing the highest grade of metal work.

In addition to the standard type, Overly Doors are supplied in a variety of styles and sizes. Special designs and construction may be covered with various metals as desired, brass, bronze, aluminum, monel metal, Everdur metal, etc., and furnished with rolled extruded or cast mouldings.

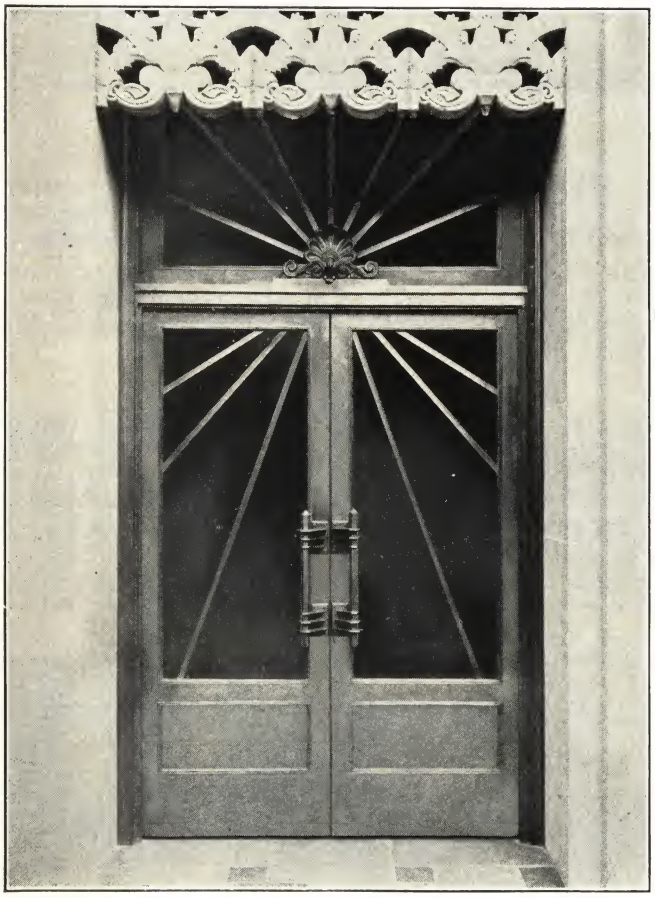
General Construction

The wood core is of thoroughly seasoned kiln dried white pine, straight and true and free from loose or unsound knots, shakes or other imperfections.

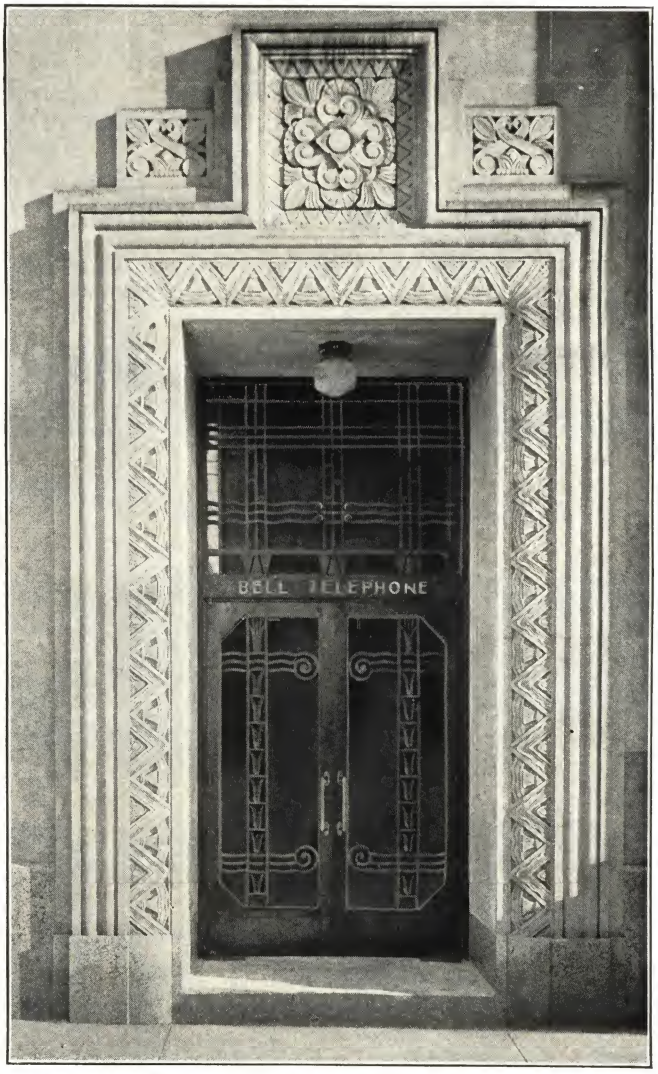
The metal is die formed to insure uniformity and made to encase each member of the door. The method of assembling assures adhering closely to the wood core. Metal is free from waves, buckles, mars or other imperfections.

Overly Service

Our Engineering Service is at your disposal to help in solving any problems involving metal covered materials. Write, telling us about the problem, and we will promptly co-operate with you.



Entrance Doors, John E. Born Building, Pittsburgh, Pa.



Entrance Doors, Bell Telephone Building, Wilkes-Barre, Pa.

SPECIFICATIONS FOR OVERLY KALAMEIN DOORS, FRAMES AND TRIM

Standard Specifications

Under this heading furnish all kalamein work and pressed steel frames as shown on drawings or door schedule.

All material shall be made in accordance with U. S. Department of Commerce, Bureau of Standards, "Simplified Practice Recommendations R83-28."

Wood Core—All kalamein doors, frames and trim have thoroughly seasoned kiln dried white pine wood cores. Each member shall be made independently and completely covered with metal as hereinafter specified. All members shall be straight and true, machined all over and free from loose or unsound knots, shakes or other imperfections.

Panels shall be of ¼ in. thick and either

(a) 3-ply laminated fir (for non-labeled)
(b) Composition asbestos board (for labeled)

and covered with metal as hereinafter specified, glued under pressure with suitable compound to assure permanent adhesion.

Metal Covering—Shall be formed from:

Optional
- (a) No. (state gauge) (No. 24 gauge for labeled)
- (b) Galvanized tight coated steel
- (c) Long terne tin
- (d) Furniture stock steel
- (e) (State weight) oz. copper (16 oz. for non-labeled) (20 oz. for labeled)

Overly doors of special design and construction may be covered with various metals as desired, bronze, brass, aluminum, monel metal, everdur metal, etc., and furnished with rolled extruded or cast mouldings.

Metal shall be die formed to insure uniformity and made to completely encase each member of the door and with projecting flanges to provide means of attaching panels and to provide bearing for glass.

Metal stile covering at top and bottom shall be double lock seamed on itself and to the metal covering for top and bottom rails.

Metal covered panels shall be electrically spot welded to flanges of metal coverings of stiles and rails with spots not over 8-in. centers.

Mouldings shall be of rolled type, 18 gauge, die mitered and acetylene welded at corners to form unit for each panel and secured with 1¾-in. oval head wood screws. Glass muntins when used shall be of same material as moulding with all intersections welded into a complete unit with moulding frame. Muntins in labeled doors shall be of solid section steel per Underwriters' standard requirement.

Doors shall be assembled in a manner to allow for unequal expansion and contraction of wood and metal.

Face joints shall be soldered and sanded smooth so as to be imperceptible after painting.

Kalamein transoms, side lights and sash (cannot be labeled) shall be made similar to doors in material and construction.

Casings, staff moulds, back bands, etc., shall be drawn through steel dies and made with wood cores and metal coverings as specified for doors. Shall be of manufacturer's stock profiles as selected.

Overly Doors, Masonic Temple, Plainfield, N. J.

Kalamein frames, transom bars and mullions (cannot be labeled; use pressed steel for labeled) shall have wood cores and metal coverings as specified for doors.

All material shall be finished at the factory with:

Optional
- (a) Grey metallic primer
- (b) Solid color lacquer
- (c) Grained to match (state wood)
- (d) As per manufacturer's sample approved

Copper covered material shall be finished:

Optional
- (a) Natural
- (b) Cleaned and lacquered
- (c) Oxidized per sample approved

This contractor shall make provision for all mortise hardware, templates and schedule of which shall be furnished him by the hardware contractor.

Underwriters' Labels—

Optional
- (a) All doors
- (b) All doors and frames

Shall bear the label of the Underwriters' Laboratories incurring the lowest rate of insurance for opening in question.

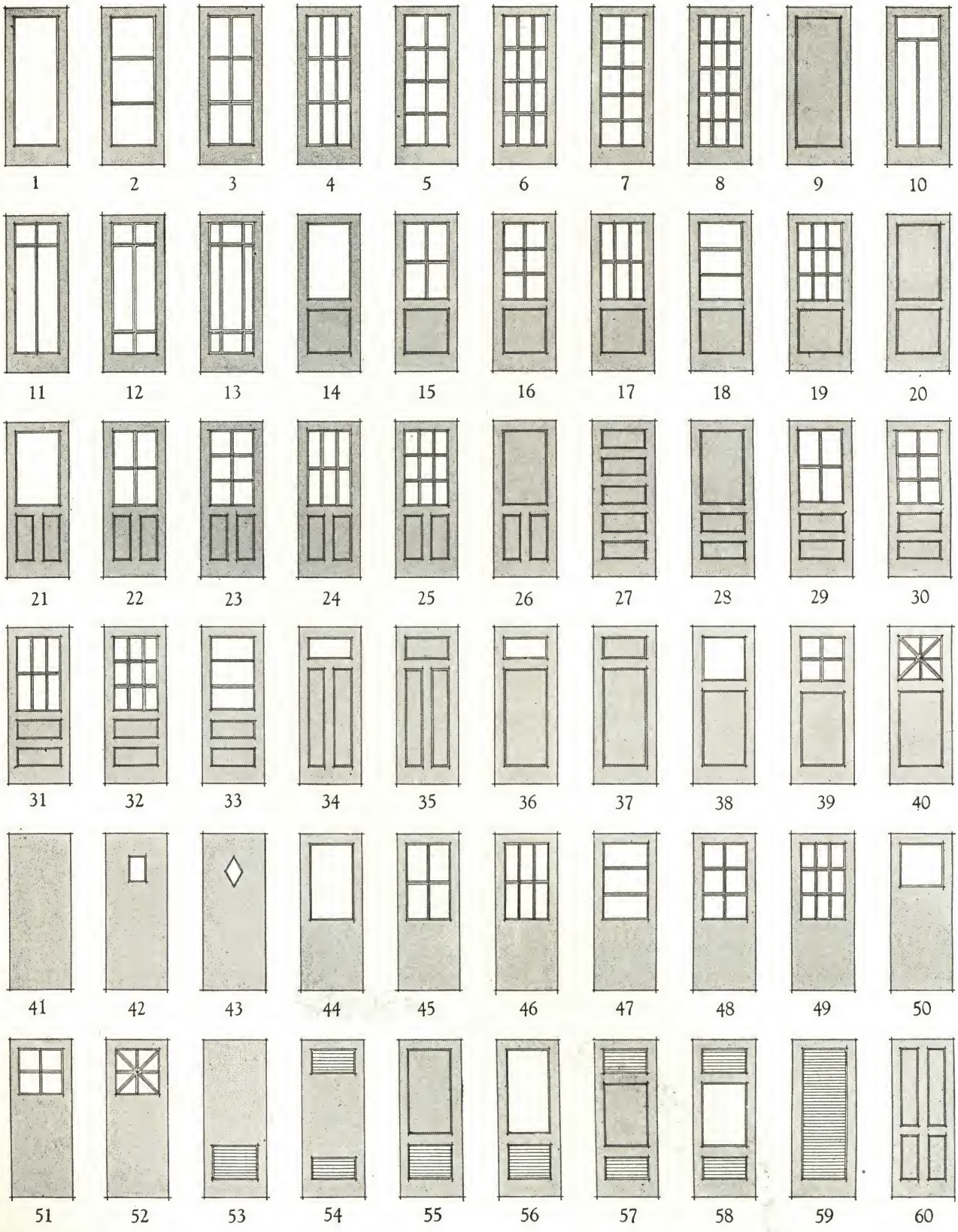
All material under this heading shall be as manufactured by W. F. Overly & Sons, Greensburg, Pa.

Overly Doors, Zembo Temple, Harrisburg, Pa.

Condensed Specifications

Under this heading furnish all kalamein work and hollow steel frames as shown on drawings or door schedule.

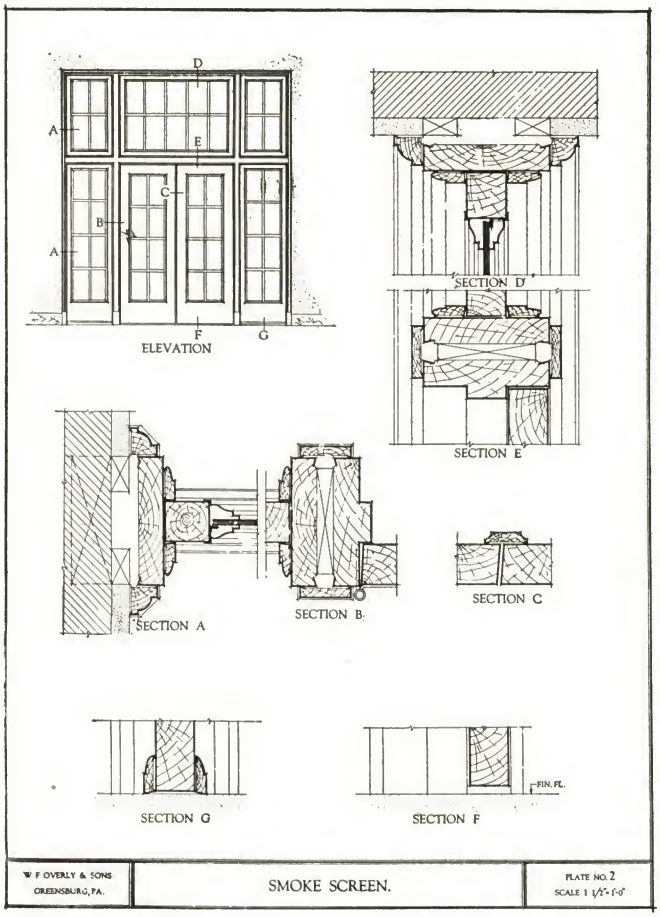
All material shall be made in accordance with U. S. Department of Commerce, Bureau of Standards, "Simplified Practice Recommendations R83-28" and in accordance with standard specifications covering this material as published by W. F. Overly & Sons, Greensburg, Pa.



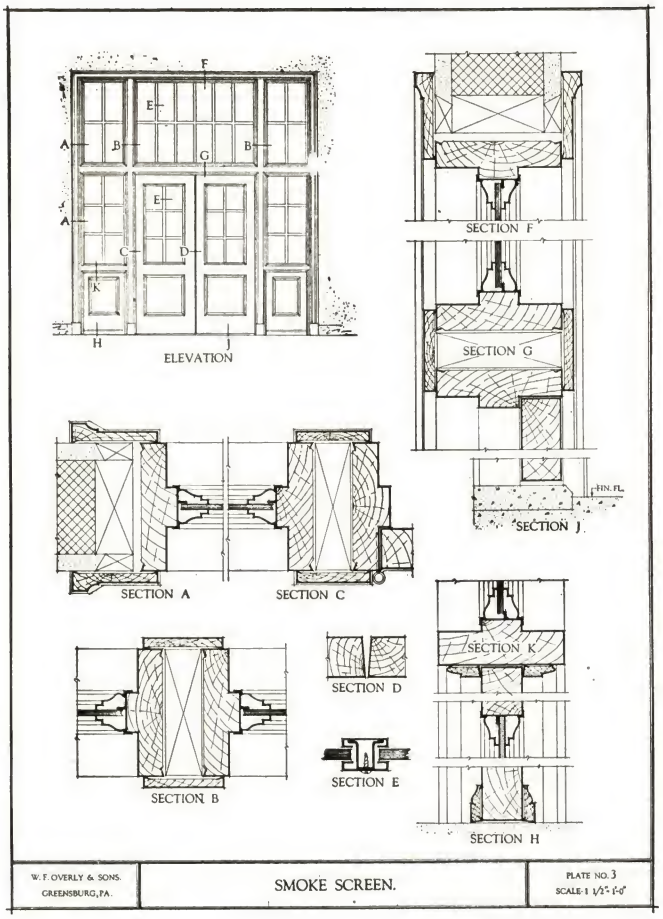
W. F. OVERLY & SONS.
GREENSBURG, PA.

DOOR DESIGNS.

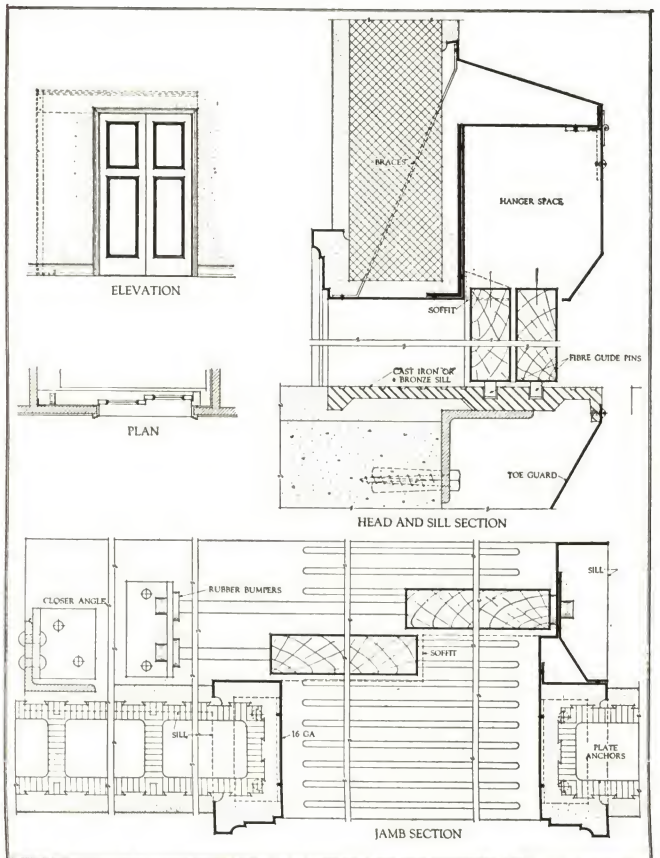
PLATE NO. 1.
SCALE 3/1 6"= 1'-0"



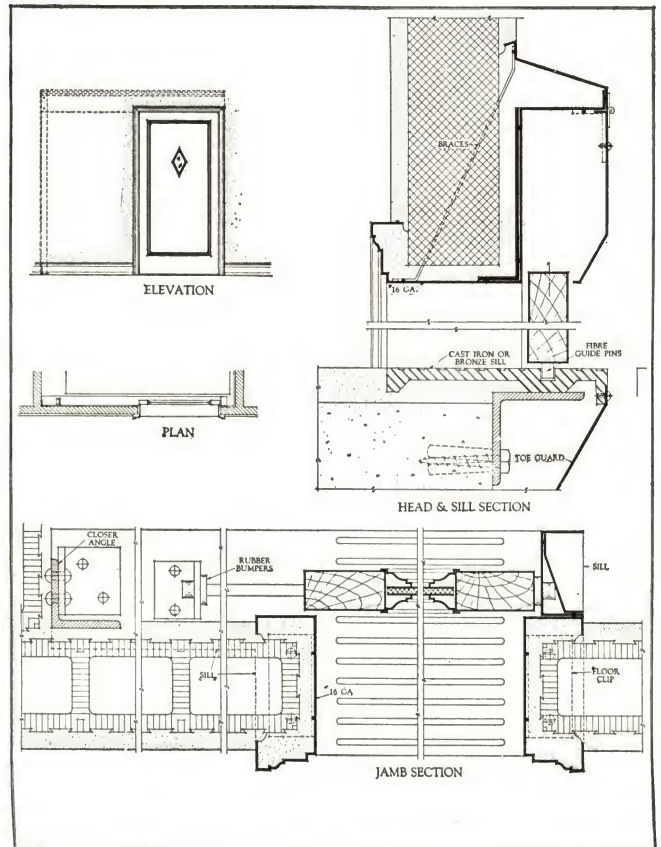
W F OVERLY & SONS GREENSBURG, PA. | SMOKE SCREEN. | PLATE NO. 2 SCALE 1 1/2"=1'-0"



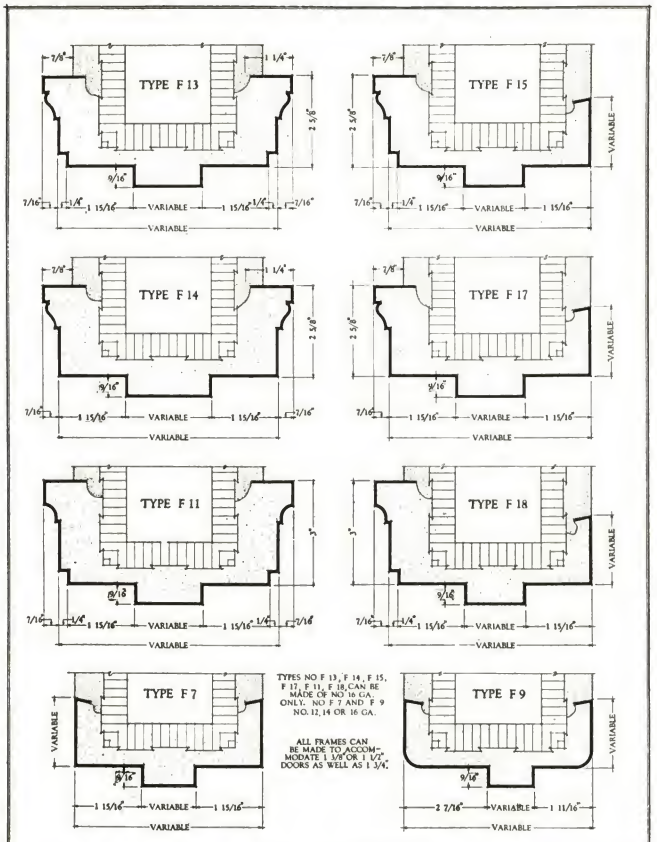
W. F. OVERLY & SONS. GREENSBURG, PA. | SMOKE SCREEN. | PLATE NO. 3 SCALE 1 1/2"=1'-0"



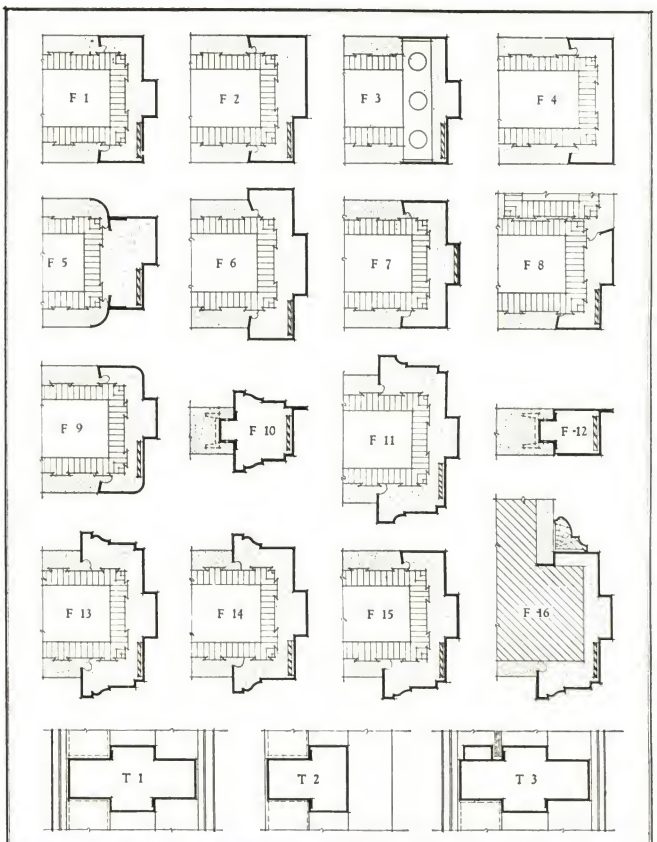
W. F. OVERLY & SONS GREENSBURG, PA. | TYPICAL DETAILS TWO SPEED ELEVATOR UNIT. | PLATE NO. 4 SCALE 1 1/2"=1'-0"



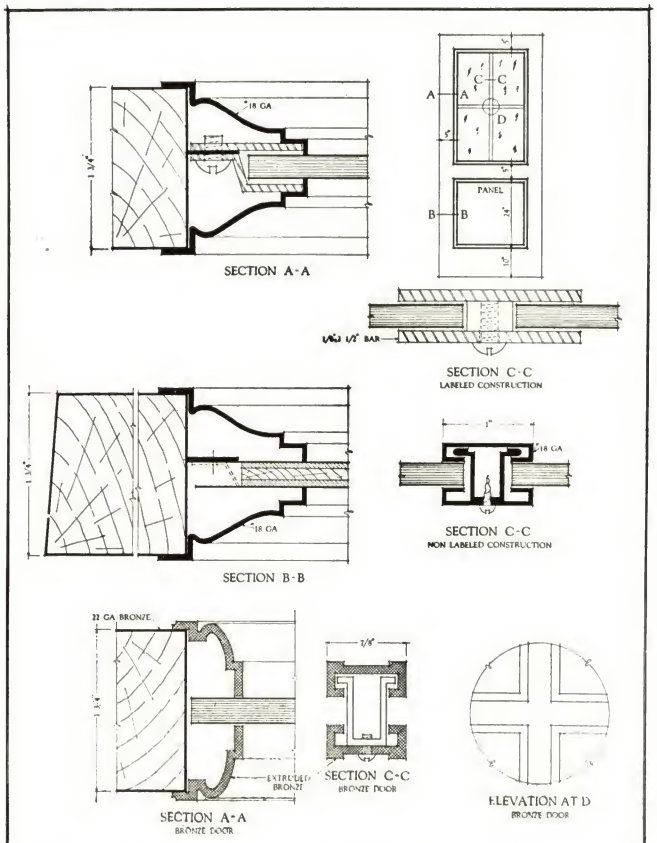
W. F. OVERLY & SONS GREENSBURG, PA. | TYPICAL DETAILS SINGLE SLIDE ELEVATOR UNIT. | PLATE NO. 5 SCALE 1 1/2"=1'-0"



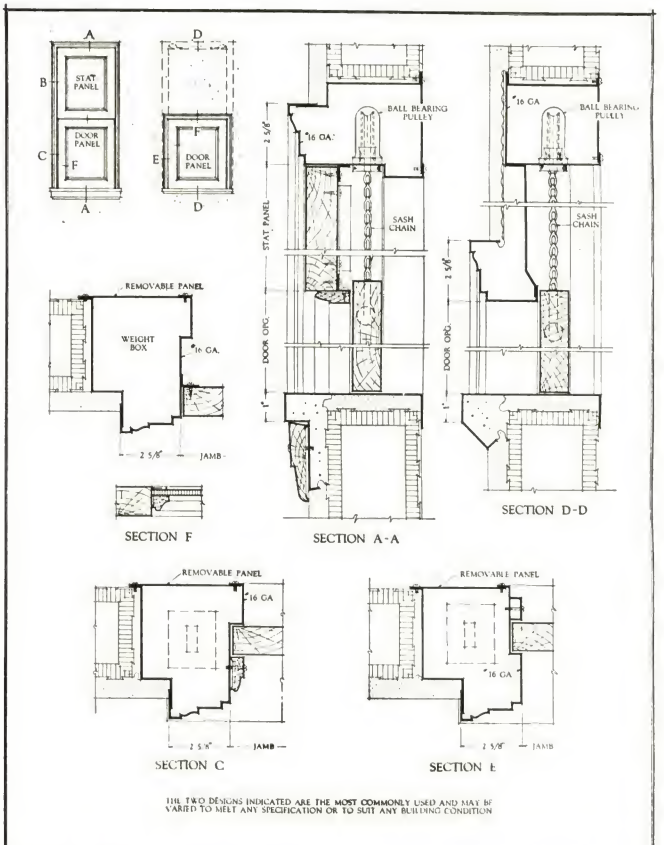
W. F. OVERLY & SONS. GREENSBURG, PA. | STANDARD FRAMES. | PLATE NO. 6 SCALE 3/1 6"-1 INCH



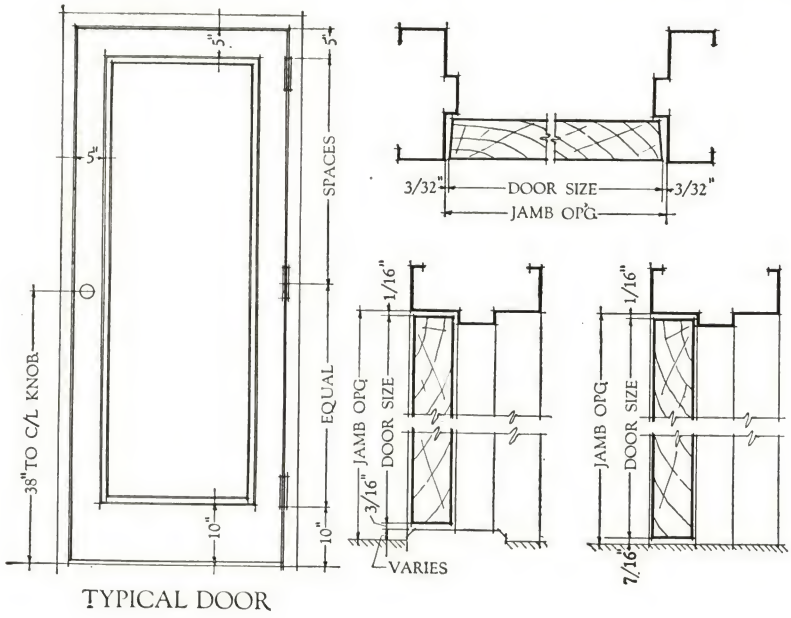
W. F. OVERLY & SONS. GREENSBURG, PA | COMBINATION STEEL FRAMES. | PLATE NO. 7 SCALE 1 1/2"-1'-0"



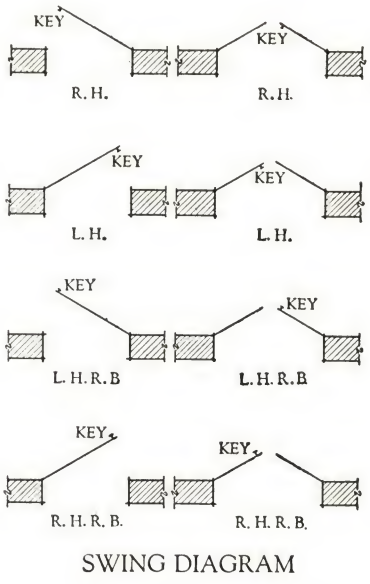
W. F. OVERLY & SONS GREENSBURG, PA. | DOOR CONSTRUCTION DETAILS. | PLATE NO. 8 SCALE 6"-1'-0"



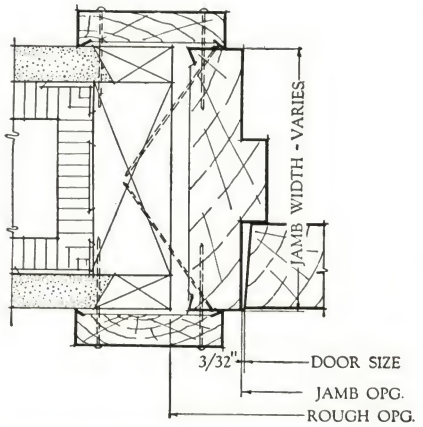
W. F. OVERLY & SONS GREENSBURG, PA | DUMBWAITER DETAILS. | PLATE NO. 9 SCALE 1 1/2"-1'-0"



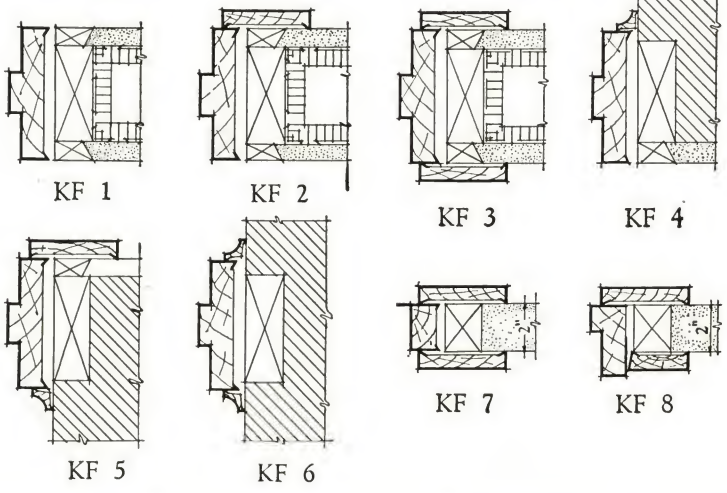
TYPICAL DOOR



SWING DIAGRAM



TYPICAL KALAMEIN FRAME



LIST OF RECENT INSTALLATIONS AND THEIR ARCHITECTS

School No. 81, Indianapolis, Ind., Kopf & Derry
Psychopathic Hospital, Colorado Springs, Colo., Chas. E. Thomas
Greenbrier Hotel, White Sulphur Springs, W. Va., Phillip L. Small, Inc.
Continental Telephone Building, Columbus, Neb., Emil Austinson & Nygard
Home for Incurables, Richmond, Va., Baskervill & Lambert
Women's Dormitory, Williams & Mary College, Williamsburg, Va., Chas. M. Robinson
Francis Hotel, Monroe, La., Wyatt C. Hedrick, Inc.
Michigan Soldier's Home, Grand Rapids, Mich., Harry L. Meade
Medical Arts Building, Pittsburgh, Pa., M. Nirdlinger
Telephone Building, Cheyenne, Wyo., W. N. Bowman
Lincoln Liberty Building, Philadelphia, Pa., John T. Windrim
Lew Wallace High School, Gary, Ind., Wm. B. Ittner
Hancock County Courthouse, Sneedville, Tenn., Allen Dryden
Holley Hotel, Bradford, Pa., Lawrie & Green
Junior & Senior High School, Washington, Pa., E. B. Lee
Jefferson County Courthouse, Beaumont, Tex., Fred C. Stone & A. Basin
Holy Cross School, Charlotte, N. Y., Geo. F. Lorenz
Convent of Incarnate Word, Houston, Tex., Maurice J. Sullivan
Palais Royal Warehouse, Washington, D. C., Abbott, Merkt & Co., Inc.
Washington Junior High School, Rochester, N. Y., E. S. Gordon
Y. W. C. A., Oklahoma City, Okla., Hawk & Parr
St. Rose of Lima School, Milburn, N. J., Fanning & Shaw
Monroe County Tubercular Sanatorium, Brighton, N. Y., Stanley Firestone
Mercy Hospital, Charlotte, N. C., Chas. C. Hook.
Tuna Lodge No. 411, Bradford, Pa., T. K. Hendryx
School of Education, Columbus, S. C., J. Carroll Johnson
School, Amelia, Ohio, F. S. Rusk
A. J. Bowen School, Washington, D. C., Municipal Architect
John Carroll University, Cleveland, Ohio, P. L. Small, Inc.
Oklahoma Biltmore Hotel, Oklahoma City, Okla., Hawk & Parr
Coliseum Building, Tulsa, Okla., Leland and Shemway
Drake Dormitory, Des Moines, Iowa, Tinsley, McBroom & Higgins
Field House, University of Maryland, Baltimore, Md., Howard W. Cutler
Women's Hospital, Philadelphia, Pa., Zantzinger, Borie & Medary
Manasquan High School, Manasquan, N. J., Coffin & Coffin

W. F. OVERLY & SONS. GREENSBURG, PA.	STANDARD CLEARANCES.—SWING DIAGRAM. TYPICAL KALAMEIN FRAMES.—INSTALLATIONS.	PLATE NO. 11. SCALE 1 1/2" = 1'-0"

THE PHILIPP MANUFACTURING COMPANY

Manufacturers of Kalamein Doors, Sliding Door Hardware and Hardware Specialties

EASTHAMPTON, MASS.

Products

METAL COVERED KALAMEIN DOORS, WINDOWS, DOOR FRAMES, TRIM, UNDERWRITERS' LABELED KALAMEIN DOORS; SMOKE SCREENS; ELEVATOR FRONTS; DUMBWAITER DOORS; BRONZE and COPPER KALAMEIN DOORS.

Metal Covered Doors

Wood cores are made of No. 1 sound, kiln dried white pine, free from loose or large knots, dry rot, sap or shake. Machine sized to accurate dimensions.

Stiles and rails mortised and tenoned, are glued with waterproof glue, doweled and wedged, grooved to receive panels.

Metal covering for stiles, rails and panels is 26 gauge galvanized or kalamein, 16 to 32 oz. copper, 20 gauge bronze. Door mouldings and trim, 26 gauge kalamein, 14 oz. copper or 24 gauge bronze.

Panels are composition board with metal glued to surfaces with waterproof glue, under pressure.

Special care is taken in assembling to avoid bench marks as much as possible.

All joints between metal filled with solder and scraped smooth. All material has shop coat of special metal primer.

Specifications for Underwriters' Labeled Kalamein Doors

Our Underwriters' labeled kalamein doors are built with wood cores of No. 1 sound, kiln dried white pine, free from loose or large knots, dry rot, sap or shake. Machine sized to accurate dimensions.

Stiles and rails mortised and tenoned, are glued with waterproof glue, doweled and wedged, grooved to receive panels.

Metal covering for stiles, rails and panels 24 gauge patent leveled galvanized sheets. All joints between stiles and rails interlocked and filled with solder, which is scraped off to smooth surface.

Panels are 1/4-in. asbestos with metal glued to surface with waterproof glue under pressure. Panels grooved into stiles and rails and bolted through stile metal, making metal covering practically one piece.

All material to have shop coat of paint.

Labeled doors in vertical shaft opening must be solid panel.

Labeled doors in corridor or room partition opening may have glass openings not exceeding 1296 sq. in.

Labeled doors in fire escape opening may have glass openings not exceeding 720 sq. in.

Maximum size permitted by Underwriters in all cases is 4 ft. wide by 8 ft. high for single door and 8 ft. wide by 8 ft. high for pair of doors.

Hardware

We are in position to fit for all mortised hardware on receipt of hardware schedule and samples.

Metal Covered Windows

Double hung or casement type windows are made in our standard design. All metal drawn on core to give neat and serviceable window.

Kalamein Elevator Fronts

Combined slide and swing, two-speed and three-speed, and standard swing elevator doors are serviceable and noiseless and are extensively used.

Kalamein Smoke Screens

We manufacture kalamein covered smoke screens of all types and for all conditions. Note one of our standard construction on next page.

Bronze and Copper Kalamein Doors

We also manufacture a high grade line of bronze and copper kalamein doors, etc., for entrances in banks, theaters, public buildings, etc.

Service

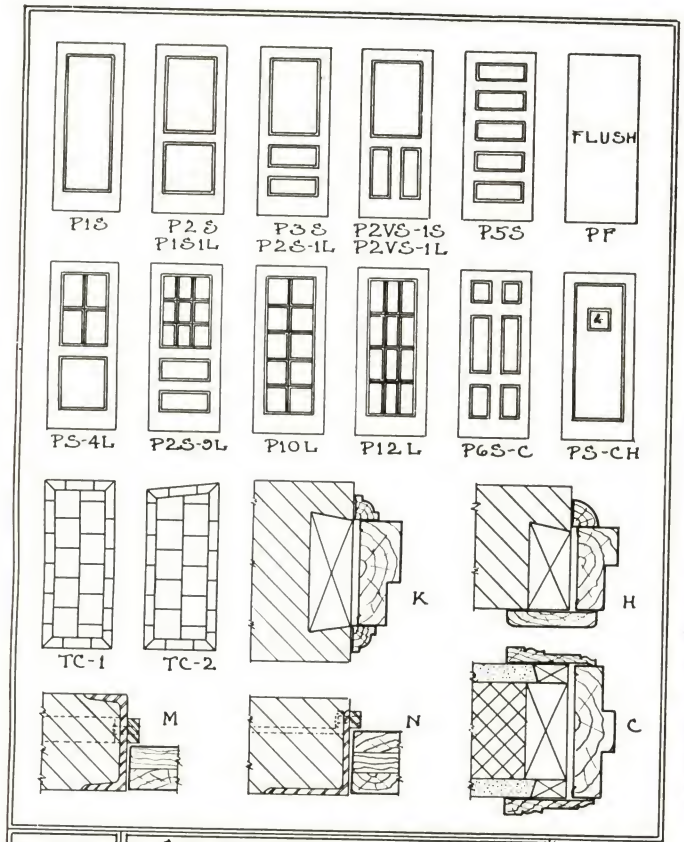
Estimates will be furnished from the architect's plans and specifications. Suggestions and shop drawings will be furnished whenever desired. We solicit your inquiries.

Blue Prints of Mouldings and Casings—We have a series of blue prints of our various stock designs of panel mouldings, stop mouldings, and casings which we will be glad to mail upon request.

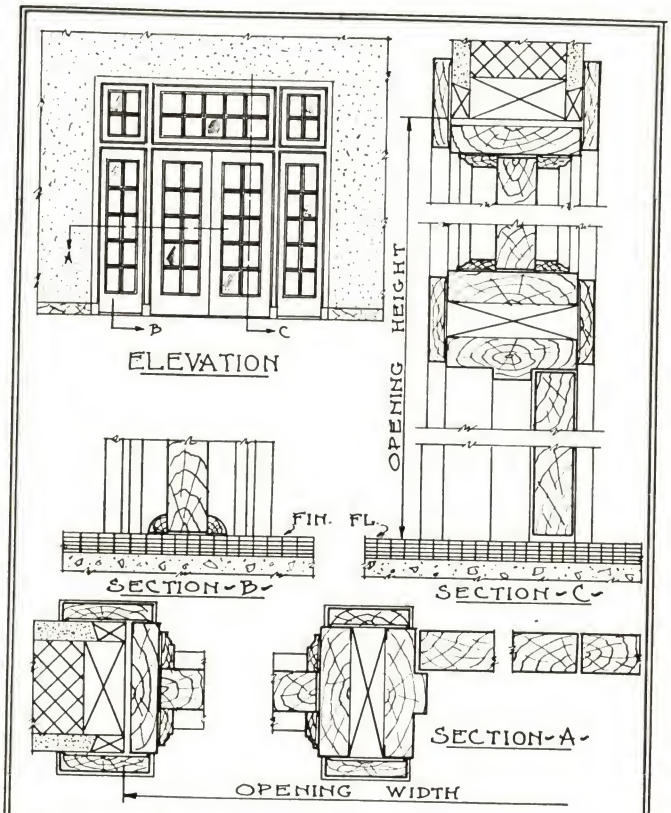
Partial List of Recent Installations

BUILDING AND LOCATION	ARCHITECT
Physical Education Building, Massachusetts Agricultural College, Amherst, Mass.	Morse & Dickinson
Dickinson Hospital, Northampton, Mass.	Putnam & Stuart
State Normal School, Worcester, Mass.	Frost, Chamberlin & Edwards
Medical Building, City Hospital, Boston, Mass.	Jas. H. Ritchie & Assoc.
Biology Building, Harvard University, Cambridge, Mass.	Coolidge, Shepley, Bulfinch & Abbott
Addition Montclair School, Quincy, Mass.	Wm. Chapman
Eno Memorial Hall, Simsbury, Conn.	Smith & Bassette
High School, New Britain, Conn.	Warren, Holmes & Powers
Sterling Law Building, Yale University, New Haven, Conn.	Jas. Gamble Rogers
Southwest School, Hartford, Conn.	Ebbets & Frid
Northeast School Gymnasium, Hartford, Conn.	Whiton & McMahon
Home for Aged, Providence, R. I.	Krokyn & Browne
American Telephone & Telegraph Co., Danielson, Conn.	R. W. Foote
Stone Theatre, Binghamton, N. Y.	G. F. Strotz

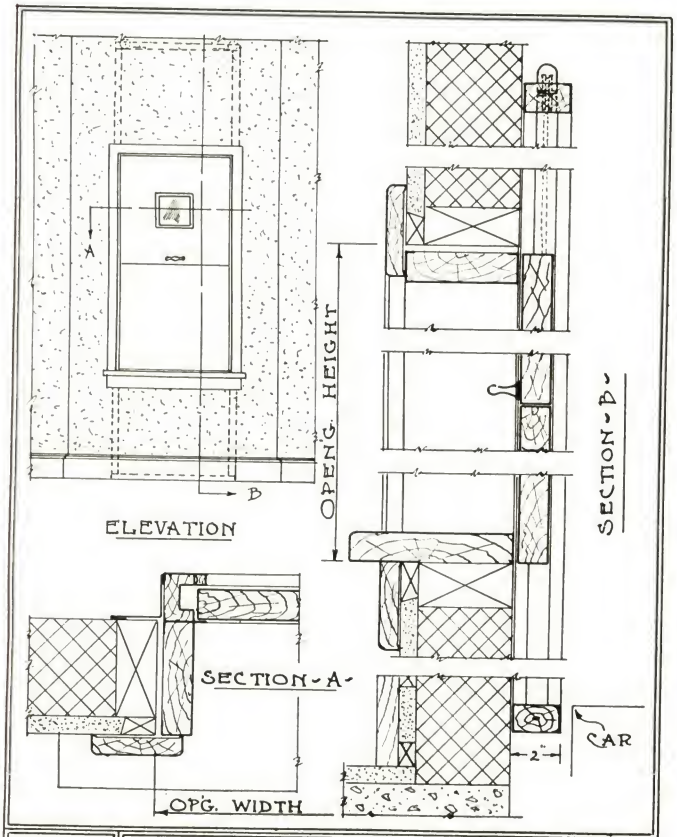
BUILDING AND LOCATION	ARCHITECT
International Business Machines Corp., Endicott, N. Y.	C. H. Higgins
Public School No. 12, Troy, N. Y.	Milliman & Morgan
School No. 11, Woodbridge, N. J.	Jensen & Rasmussen
Campbell Soup Co., Camden, N. J.	Francisco & Jacobus
High School Annex, Allentown, Pa.	Ruhe & Lang
State Teachers' College, Edinboro, Pa.	Meyers & Johnson
Olivet Presbyterian Church, Harrisburg, Pa.	C. J. Lappley
Loretto Science Hall, Loretto, Pa.	A. M. Tadajeske
Tuberculosis Building, Philadelphia General Hospital, Philadelphia, Pa.	Philip Johnson
Isalay Dairy, Pittsburgh, Pa.	McCormick Co.
High School, State College, Pa.	Eden & Kapp
School No. 50, Baltimore, Md.	W. H. Emory, Jr.
Denbeigh Hall, Wilmington, Del.	Wallace E. Hance
Nurses' Home, Providence Hospital, Washington, D. C.	A. B. Mullette & Co.
Stuart Jr. High School, Washington, D. C.	A. L. Harris
Museum of Art, Toledo, Ohio	Edw. B. Green & Son
High School, Perrysburg, Ohio	Britsch & Munger
State Street Jr. High School, East St. Louis, Ill.	M. E. Spencer & Son
Warrior Hotel, Sioux City, Iowa	J. C. McFarland



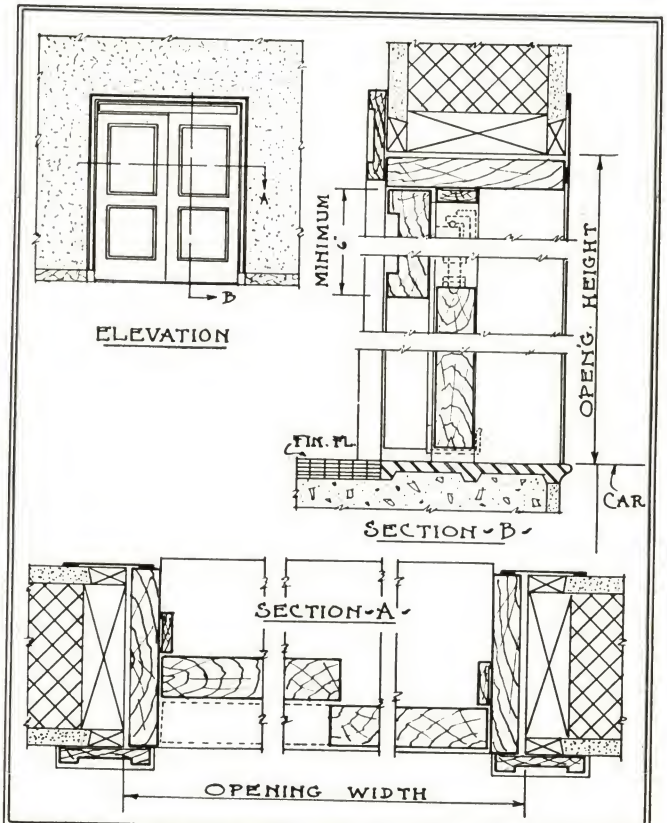
PHILIPP MFG. CO. | STANDARD KALAMEIN DOOR & FRAME DESIGNS | SCALE 1½" = 1'-0"



PHILIPP MFG. CO. | STANDARD KALAMEIN SMOKE SCREEN | SCALE 1½" = 1'-0"



PHILIPP MFG. CO. | KAL. COUNTERBALANCED DUMBWAITER FRONT | SCALE 1½" = 1'-0"



PHILIPP MFG. CO. | KALAMEIN SLIDE & SWING ELEVATOR UNIT | SCALE 1½" = 1'-0"

SYRACUSE FIRE DOOR CORPORATION

INC.

Manufacturers of Metal Covered Doors and Trim and Tin Clad Fire Doors

900 Canal Street
SYRACUSE, N. Y.

Products

UNDERWRITERS' LABELED and NON-LABELED KALAMEIN DOORS, covered with copper, bronze, kalamein steel (long terne or galvanized), aluminum or monel metal; UNDERWRITERS' LABELED TIN CLAD FIRE DOORS and FIRE DOOR HARDWARE.

Also manufacturers of Metal Covered Frames, Trim, Mouldings, etc.; Metal Covered Window Units, Dumbwaiter Units, Elevator Fronts, Smoke Screens, Partitions, Channel and Angle Iron Frames.

Syracuse Kalamein Doors

These doors are made in a variety of standard designs for use in office buildings, public buildings, schools, theaters, stores, hospitals, etc.

The wood used in the cores is thoroughly seasoned and kiln dried. Panels are carefully built up and covered with metal, both sides glued, and placed under heavy pressure to insure good contact and eliminate any buckling. Mouldings are drawn true and accurately mitered. All joints are soldered and ground to smooth surface. Doors are furnished with either kalamein or hollow metal mouldings.

Standard thicknesses for metal covered doors are either 1¾ or 2¼ ins.

Whenever practical, the metal covering in our kalamein doors, jambs, casings, mouldings, etc., is carefully drawn on the wood cores through steel dies.

The metal used in Syracuse standard kalamein doors, for covering stiles, rails and panels of doors is galvanized or lead coated roller leveled copper bearing steel (prime) sheets. All metal joints on labeled kalamein doors between stiles and rails are of the integral lock seam type.

Finishes—Copper doors—oil finish, statuary bronze; bronze, emery rubbed and lacquered; and polished aluminum. Unless otherwise advised, our doors, etc. are given one shop coat of special metallic primer.

Labeled Kalamein Doors

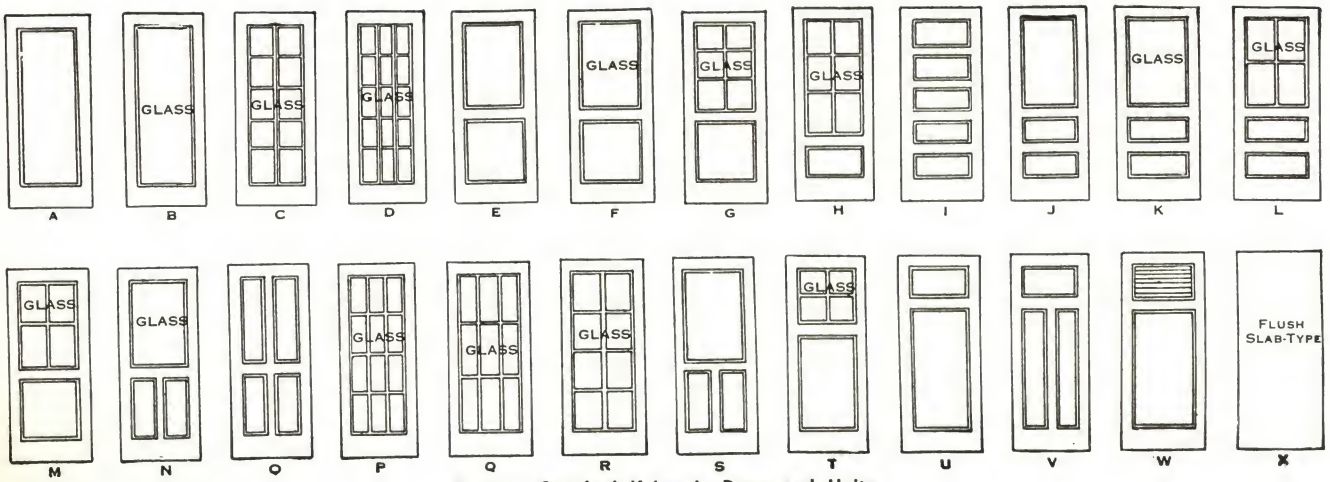
We specialize in labeled kalamein doors, and know that no better material or workmanship can be put into these doors. We mortise for hardware in our factory, which is much more satisfactory than doing it in the field, and thus makes the erection a very simple matter.

Our Engineering Department is always at your service, and ready to assist in solving any special construction problems, based on the requirements of each particular installation. The experience of the personnel in this department enables us to give the best engineering service to architects and contractors. We submit shop details for approval, and we believe that no concern in the fireproof door industry furnishes drawings better than ourselves.

Tin Clad Fire Doors and Shutters

All types of labeled and unlabeled, two-ply and three-ply tin clad fire doors and shutters to fill conditions imposed by insurance and building requirements. First class materials, careful workmanship developed by many years of experience, and the most modern and efficient machinery serve to make these fireproof units of most approved design.

Doors and hardware bearing the label of the National Board of Fire Underwriters' are inspected by their representative at our shop. This is an additional warranty of their worth as fire retardants.



Syracuse Standard Kalamein Doors and Units

DUSING AND HUNT, INC.

Underwriters' Labeled Tin Clad and Kalamein Doors and Frames

382 Michigan Avenue, BUFFALO, N. Y.

Products

UNDERWRITERS' LABELED TIN CLAD and KALAMEIN DOORS; PROJECTION BOOTH SHUTTERS.

Also Elevator Enclosures, Combination Steel Frames and Elevator Safety Gates.

Facilities and Service

Our Engineering Department, solving special fire door problems for over 25 years, invites architects and builders to refer such matters to it. Our well-equipped factory enables us to give unusually speedy delivery, and we can erect doors built for service in any part of the United States.

Tin Clad Heavy Duty Fire Doors

Types—Swinging, sliding, vertical sliding, bi-swing, bi-folding; in fact, any type to meet the various conditions.

Hardware—All hardware extra heavy in design. With malleable iron castings, and listed by the Underwriters' Labeled Service.

Approval—Labels can be obtained for tin clad sliding doors not exceeding 120 sq. ft.; height or width not exceeding 12 ft. For single swing doors not exceeding 6 ft. wide or 12 ft. high. For swinging doors in pairs not exceeding 10 ft. wide or 12 ft. high.

Steel Frames for Swinging Doors—Heavy steel frames or angle iron construction, made especially for labeled tin clad fire doors are furnished with automatic closing device and all other hardware attached.

Kalamein Doors

Doors are made in standard designs as detailed below, with or without Underwriters' Labels, or built to the architect's design if required.

Cores—All wood in cores of clear white pine, well seasoned and free from defects.

Metal Covering—Kalamein iron, furniture steel, copper or bronze in standard gauges.

Construction—Cores of solid pieces mortised and tenoned joints, panels of asbestos or composition board.

Metal covering drawn over wood cores and glued to panels under pressure, all by best and most modern practice, making surface of doors smooth and free from waves or buckles; all joints interlocked and filled so as to produce invisible seams.

Mouldings are furnished metal covered or hollow drawn, with invisible fasteners or screwed in place as desired, mitered accurately, made with profiles well defined.

Standard thicknesses for doors 1¾ or 2¼ in., according to conditions.

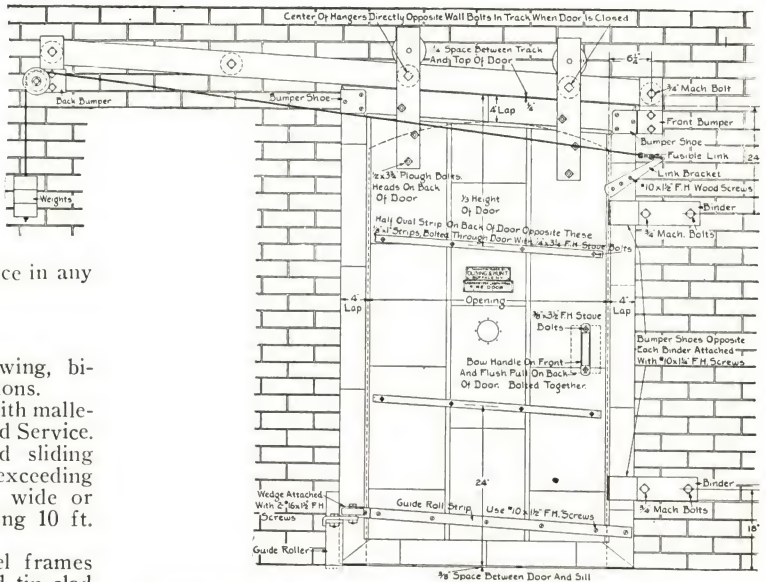
Finish—All doors receive a prime coat of paint before leaving our factory.

Approval—Our doors, jambs and trim have been approved by leading architects and contractors. Their long life and service on past installations have made this possible.

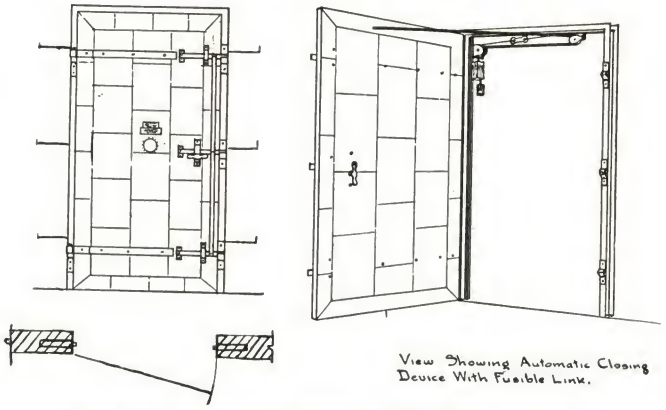
Labeled Service

Stair and Elevator Doors—Single doors up to 48 in., in pairs to 96 in. Solid panels erected in channel iron frames or combination steel bucks with 5x5-in. butts, full surface type, mortised locks with ¾-in. throw bolts. Stair doors to be self-closing by means of door check.

Fire Escape and Tower Doors—Sizes same as above,



Detail of Standard Labeled Sliding Tin Clad Fire Door



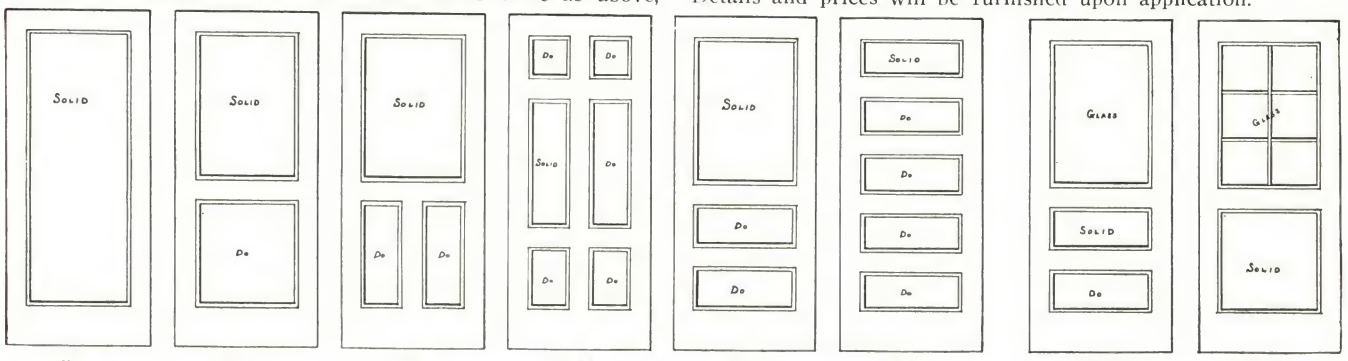
Standard Labeled, Swinging, Tin Clad Fire Door and Channel Iron Frame

hung in the same type of frame and with the same type of hardware. Doors can be constructed to receive 5 sq. ft. of wire glass.

Corridor and Partition Doors—Same as above, except that 8 sq. ft. of glass may be used.

Projection Booth Shutters

Automatic self-closing shutters with rolled steel frames, so constructed as to pass the State and local insurance rating boards. Also designed to be sound retarding as required where sound pictures are shown. Automatic closing device so designed that all shutters will close separately or as a unit. Details and prices will be furnished upon application.



Standard Labeled Kalamein Door Types

FIRECRAFT DOOR CO.

SUCCESSORS TO FIRECRAFT CORPORATION

3313 Wallace Street
CHICAGO, ILL.

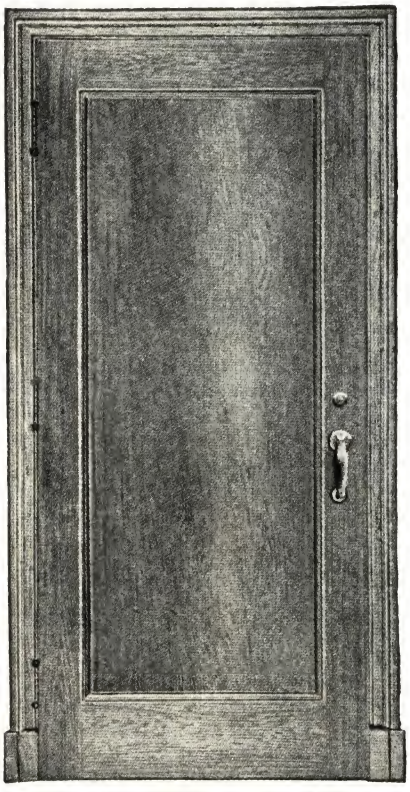
REPRESENTATIVES IN PRINCIPAL CITIES

Products

Hollow metal doors, Nos. 100 to 199.
Passenger elevator doors, Nos. PE1 to PE99.
Dumbwaiter doors, Nos. DW1 to DW10.
Freight elevator doors, Nos. FB1 to FB50.
Steel fire doors, Nos. 300 to 500.
Tin clad doors, Nos. 550 to 599.
Steel plate doors, Nos. 600 to 650.
Storeroom doors, No. 900.

"Firecraft" Hollow Metal Doors and Frames

Description—Stiles and rails formed of 18 gauge patent leveled, cold rolled furniture steel. Cork is inserted in all stiles and rails so as to prevent metallic sound. Panels are constructed of two sheets of No. 18 gauge steel separated by ¼ in. asbestos millboard. Drawn or pressed 20 gauge mouldings are carefully mitered and fitted. The panels and cross rails are locked into the stiles with lock strips and welded so as to make doors rigid and strong. All joints and seams are made perfectly smooth and invisible. Hardware connections are heavily reinforced and welded in position. This construction meets with the requirements of the National Board of Fire Underwriters and doors bear their labels when so specified.



"Firecraft 100" Hollow Metal Door
Style 101 with Baked Enamel Finish

Specifications — (1) To openings as shown, provide "Firecraft" Type No. 100 Hollow Metal Doors, as made by the FIRECRAFT DOOR CO., Chicago Ill.

(2) Doors to be made of 18 gauge patent leveled furniture steel.

(3) All seams to be perfectly smooth and invisible.

(4) Hardware furnished by others will be applied to doors at factory.

(5) Underwriters' labels to be provided on doors as required to insure lowest possible insurance rates.

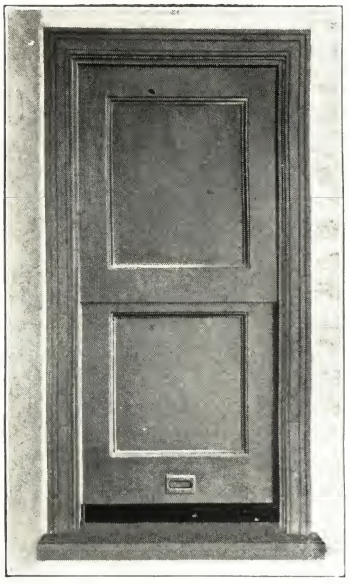
"Firecraft" Dumbwaiter Doors

Description—Hollow metal dumbwaiter openings can be furnished in single or double panel units. (For construction see hollow metal doors.) We also manufacture steel plate counterbalanced dumbwaiter doors which are rigid, neat in appearance and economical to install.

Specifications—To all openings in dumbwaiter shaft as indicated provide "Firecraft" hollow metal (or steel plate) dumbwaiter openings as made by the FIRECRAFT DOOR CO., Chicago, Ill.

(1) Doors to be made of 18 gauge patent leveled steel with all seams smooth and invisible. *(For steel plate installations specify*—Doors to be made of 16 gauge steel welded into angle frames.)

(2) Frame sheaves, chain, etc., to be installed as a complete unit finished with prime coat rust resisting paint (or baked enamel finish).



"Firecraft" Dumbwaiter Door
Type No. DW2 Hollow Metal Double Panel Unit—Upper Panel Stationary

"Firecraft" Balanced Doors

Description — (1) Doors are provided with heavy guides that insure rigid alignment at all times.

(2) Door panels are heavily reinforced.

(3) Sheaves are cast iron roller bearing to secure easy operation.

(4) Latch is strong and secure.

(5) All parts carefully made to insure long life.

(6) Construction of guides prevents clogging by dirt, grease, etc.

(7) Anti-friction clips guide the doors without binding or sticking.

Specifications — (For Freight Elevator door)— (1) To all openings in freight elevator shaft, as noted, furnish and install "Firecraft" Balanced Door, as made by the FIRECRAFT DOOR CO., Chicago, Ill., including truckable sill, guides, roller bearing sheaves, latch and necessary hardware to make a complete installation.

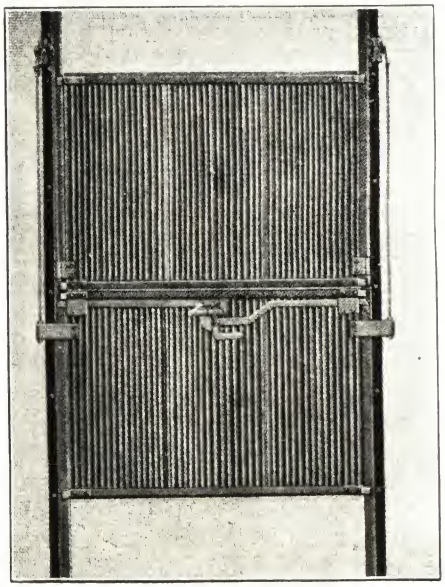
(2) (a) Doors are to be made of 22 gauge corrugated panels with 1½ in. angle frames, labeled by the Underwriters' laboratories, Inc.

(b) Or, specify: Doors to be Kalamein, hollow metal, etc., either paneled or plain.

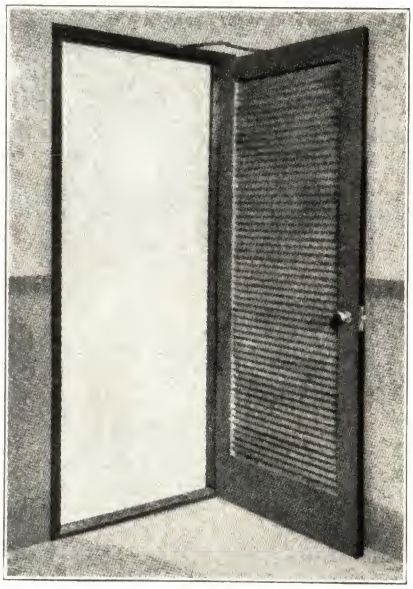
(c) If vision panel is wanted, specify: Doors to have polished wire glass vision panel 12x12 in.

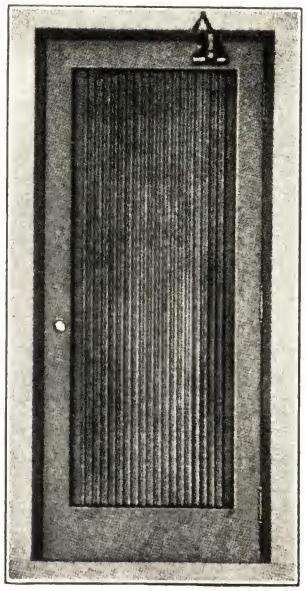
(3) Doors to be manually operated and automatically closing as car leaves the floor or have electric contact so that car can not be started until door is closed.

Basement door is to be provided with a key so it can be opened from the floor.

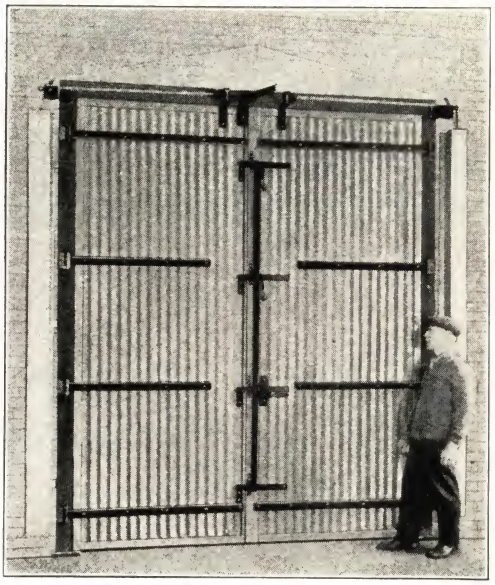


"Firecraft" Balanced Freight Elevator Door (Shaft Side)
Inspected and labeled by Underwriters' Laboratories, Inc., and Factory Mutuals

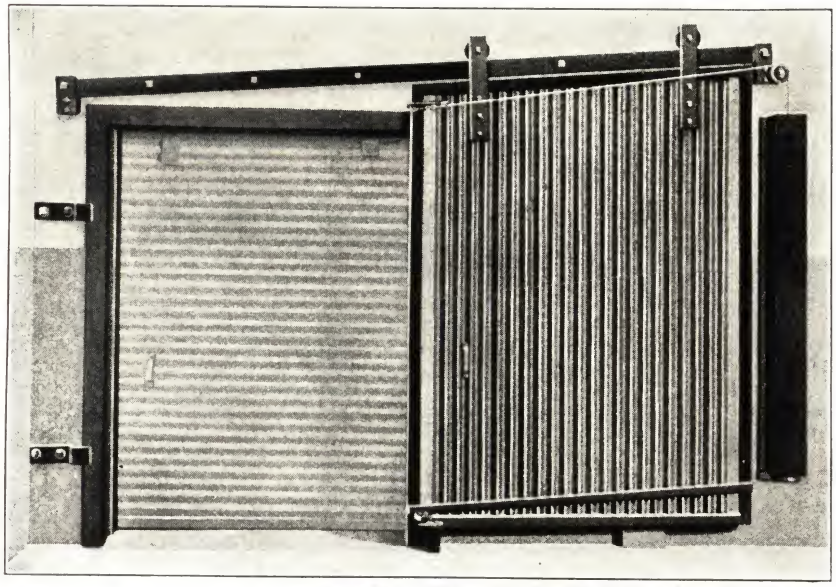




"Firecraft" Type No. 500 Stair Door Open and Closed
Made of galvanized steel with mortised hardware



Large Pair "Alstele" Swinging Doors, Type 310 Automatic
Can be made in any practical size



"Firecraft" Single Sliding Gravity Type, Door No. 400
Overlapping wall 4 in. at sides and top.
Automatic hardware

"Firecraft Alstele" Types Nos. 300, 400 and 500 Doors (Patented)

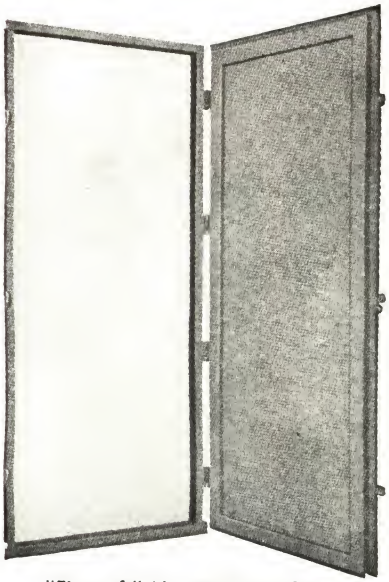
Description—Constructed of two layers of cross-laid steel sheets, galvanized and corrugated, interlined with asbestos. Edges riveted to heavy galvanized steel stiles and rails. Made in all types: swinging, sliding, slide-up and turn-over, etc.

Advantages—Fireproof, strong, rigid and comparatively light in weight. Easily operated. Not subject to dry rot, as in the case of tin clad doors.

Specifications—(1) To all openings in fire wall, vertical shaft, exterior walls, etc., as noted, furnish and install "Firecraft Alstele" doors as made by the FIRECRAFT DOOR CO., Chicago, Ill., including all necessary hardware. (a) *If frames and sills are wanted specify:* "Openings to be provided by this contractor with steel frames and sills as shown."

(2) Doors are to be made of galvanized steel with double corrugated panels and 18 gauge stiles and rails, labeled by the Underwriters' Laboratories, Inc. (or factory Mutuals if preferred). (a) *If panels for glass are wanted, specify:* "Doors to be paneled for glass in upper part size ....x.... in.; glass and glazing by others."

(3) Doors to be provided with fuse link automatic gravity closing devices (or checks for stair doors, if preferred).



"Firecraft" No. 900 Door Open, Inside View
Note clear, smooth, easily cleaned surfaces

"Firecraft" Type No. 900 Doors— Underwriters' Labeled (Patents Pending)

Description—Type No. 900 doors are designed particularly for storerooms of storage warehouses, but may be used for penthouse and exterior openings. They are a distinct departure from the customary storeroom doors as they are *rigid* and yet not unwieldy.

The outside is ruggedly protected with heavy strap hinges, butts, latches, etc., while the inside surface is clear and easily cleaned, with no projecting cross bars to catch dust.

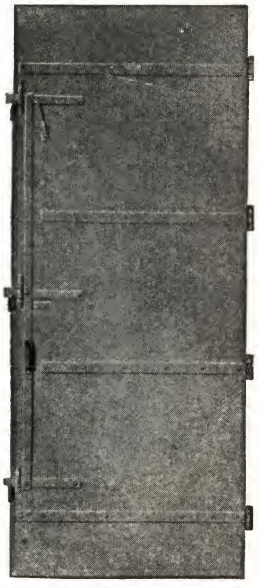
Specifications—(1) To all openings as shown provide "Firecraft" Type 900 doors with channel frames and standard hardware as manufactured by the FIRECRAFT DOOR CO., Chicago, Ill.

(2) Doors to be constructed of steel having 14 gauge panels and 20 gauge stiles and rails.

(NOTE: For exterior openings specify doors to be made of galvanized steel.)

(3) Hardware to consist of steel butts, strap hinges and triple latch riveted to door. Provide hasp and eye for padlock.

(NOTE: Standard hardware consists of handles one side only. If handles on both sides or cylinder dead lock are desired, so specify.)



"Firecraft" No. 900 Door Closed, Outside View
Note strong hinges, etc.

ESTABLISHED 1866

MERCHANT & EVANS CO.

Manufacturers of Fire Doors and Shutters

PRINCIPAL OFFICES

PHILADELPHIA, PA.

Also Sold by: GLOBE AUTOMATIC SPRINKLER COMPANY (General Agents)

OFFICES IN PRINCIPAL CITIES

"ALMETL" TRADE MARK REG. U.S. PAT. OFF.

FIRE DOORS AND SHUTTERS

Products

M & E "ALMETL" Labeled FIRE DOORS and SHUTTERS.

M & E "ALMETL" Unlabeled Doors, for factory and warehouse service.

For "Star" Roof Ventilators, see Manufacturers' Index.

M & E "Almetl" Labeled Fire Doors

Labeled "Almetl" Fire Doors and Shutters for all building openings under jurisdiction and control of insurance interests.

M & E "Almetl" Fire Doors are made in two thicknesses: 2¾ and 1⅞ in. The 2¾-in. door is labeled by Underwriters' Laboratories, Inc. for fire walls (Class A), vertical shafts (Class B), corridor and room partitions (Class C), and exterior openings (Classes D and E) when type and pattern are within the prescribed opening size limits.

The 1⅞-in. door is labeled by Underwriters' Laboratories, Inc. for Class B, C, D, and E situations when type and pattern are within the prescribed opening size limits.

Approvals—Inspected and labeled by the Underwriters' Laboratories, Inc., Chicago, Ill. and Factory Mutual Laboratories, Boston, Mass.; also approved and used by United States Government. Endorsed and recommended by over 250 National, State and Municipal fire and safety control authorities.

Types—Single sliding, pairs sliding, single swinging, pairs swinging, vertical sliding and horizontal lifting.

We also furnish "Almetl" Doors with convex heads, with panels for wire glass, with wicket gates, or recessed for overhead monorail systems.

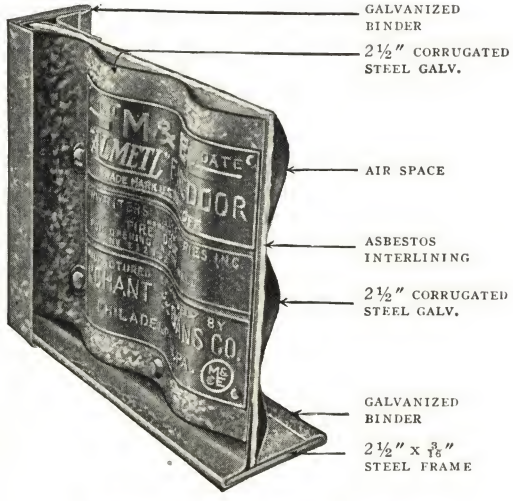
Sliding doors made sectional for assembly at destination when occasion requires; and doors to meet special requirements.

Advantages—Aside from the maximum reduction in insurance rates for installation of M & E "Almetl" Doors, the buyer is assured of 100% value, permanence and service due to the lasting and indestructible materials used in their construction. "Almetl" Doors are all steel and asbestos.

Twenty-year guaranteed—no better value in a "labeled" fire stop obtainable.

They are lighter, and the cost of maintenance is negligible.

Hardware—Fully approved and labeled hardware furnished with detailed erection prints.



Construction of "Almetl" Fire Door
Weight, 4¾ lb. per sq. ft.

Special hardware to meet unusual conditions when required. Lighter unlabeled hardware for unlabeled doors and panels.

Specification for Labeled Fire Doors

Fire doors where indicated on the plans or door schedule shall be M & E "Almetl," as manufactured by MERCHANT & EVANS CO. (principal office, 2035 Washington Avenue, Philadelphia, Pa.).

Doors shall be made of two thicknesses of No. 24 gauge—2½-in. corrugated galvanized steel transversely laid, interlined with asbestos roll board in a continuous rigid frame of 2½x3/16-in. bar steel bound in a heavy gauge galvanized steel covering tightly riveted to the frame.

Proper provision to be made for expansion and contraction without distortion.

Each door, whether sliding or swinging shall bear the label of the Underwriters' Laboratories, Inc., and also that of the manufacturer.

All hardware and automatic closing devices shall be in strict accordance with requirements of Fire Underwriters having jurisdiction.

M & E "Almetl" Unlabeled Service Doors

Unlabeled "Almetl" Service Doors for all commercial purposes—to enclose openings to street, yard, loading platforms; for sheds, exterior and interior openings of all kinds not subject to insurance control.

These doors are of the same sturdy construction as the labeled product, excepting slight reduction in insulation features.

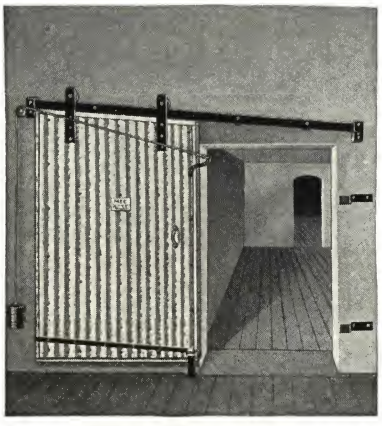
The special merits and advantages of these doors are light weight, neat appearance, low cost, durability in service. They can be designed for every use and any building mechanic can install them, using standard warehouse door hardware.

Service

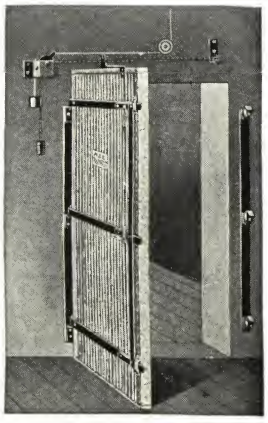
We or our 300 responsible and experienced "contracting and erecting licensees" will quote on "Almetl" Doors and Shutters separately, with or without "approved" hardware and installation—for any contract anywhere.

Our centrally located plant is equipped with up-to-date machinery and skilled workmen.

Our sales and engineering department is thoroughly informed and organized to advise on any unusual or complex installation problem.



Single Sliding Door



Single Swinging Door

PEELLE FREIGHT ELEVATOR DUMBWAITER INDUSTRIAL ENTRANCE DOORS

THE PEELLE COMPANY

BROOKLYN, N.Y.

A MEMBER
OF
THE PRODUCERS' COUNCIL

THE PEELLE COMPANY

47 Stewart Avenue
BROOKLYN, N. Y.

TELEPHONE STAGG 2-0366

DISTRICT OFFICES

ATLANTA, GA., 413 Norris Building—Telephone, Walnut 5125
BALTIMORE, MD., 211-17 East Street—Telephone, Calvert 4312
BOSTON, MASS., 532 Statler Building—Telephone, Hubbard 9377, 9387
BUFFALO, N. Y., Jackson Building—Telephone, Lafayette 7143
CHICAGO, ILL., 333 North Michigan Avenue—Telephone, Central 6475
CINCINNATI, OHIO, 616 Mercantile Library Building—Telephone, Main 4146
CLEVELAND, OHIO, 605 Caxton Building—Telephone, Main 4053
COLUMBUS, OHIO, 42 East Gay Street—Telephone, Adams 9842
DALLAS, TEX., 703 Construction Industries Building—Telephone, 2-1701
DETROIT, MICH., 705 Lincoln Building—Telephone, Cadillac 4920
GREENSBORO, N. C., West Lee Street at Glenwood Avenue—Telephone, Greensboro 9996
HARRISBURG, PA., 208 Keystone Building—Telephone, 3-4126
INDIANAPOLIS, IND., 1021 Hume-Mansur Building—Telephone, Riley 2722
KANSAS CITY, MO., 408 Orear Leslie Building
LOS ANGELES, CALIF., 405 South Hill Street—Telephone, Trinity 5149
PHILADELPHIA, PA., Architects Building, 17th and Sansom Streets—Telephone, Rittenhouse 2274
PITTSBURGH, PA., 1052 Century Building—Telephone, Atlantic 2459
PORTLAND, ORE., East 8th and Market Streets
RICHMOND, VA., 11th and Bank Streets—Telephone 3-5712
SALT LAKE CITY, UTAH, 56 East 4th South—Telephone, Wasatch 5202
SAN DIEGO, CALIF., 629 West G Street at Kettner Boulevard—Telephone, Franklin 1930
SAN FRANCISCO, CALIF., 534 Sixth Street—Telephone, Hemlock 0210
SCRANTON, PA., Cedar Avenue at Laurel Line—Telephone, 3-1271
SEATTLE, WASH., 314 Seneca Street—Telephone, MA7650
ST. LOUIS, MO., 927 Century Building—Telephone, Chestnut 0866
SYRACUSE, N. Y., 145 Harding Place—Telephone, 9-2733
TAMPA, FLA., 805 Peninsular Telephone Building
WASHINGTON, D. C., 817 14th Street, N. W.—Telephone, Metropolitan 5579
WILKES-BARRE, PA., 904 Second National Bank Building—Telephone, Wilkes-Barre 3-0144

Foreword

THE PEELLE COMPANY manufactures doors for three classes of openings—doors for freight elevators, doors for dumbwaiters, and doors for industrial or commercial building entrances. All Peelle Doors are made to order to fit the size of the openings, space requirements, and descriptions given in this catalogue.

Wherever space or use conditions present special problems, THE PEELLE COMPANY will makes special doors of any suitable kind to meet such conditions.

All Peelle Doors may be manually or electrically operated. Electrically operated doors are termed "Peelle Motorized Doors".

Peelle Engineering Service will gladly furnish recommendations on any special problems.

Peelle Doors are installed and guaranteed by THE PEELLE COMPANY. This policy gives the user a responsible guarantee.

Peelle Freight Elevator Doors

Peelle Counterbalanced Freight Elevator Doors consist of two vertically sliding leaves, one balancing the other. They are installed on the shaft side of the opening and therefore take up no space on the room or hall side. They are universally used to protect the openings of fireproof freight elevator shafts.

Although Peelle Counterbalanced Doors are installed to prevent accidents and the spread of fire, they are ruggedly built to withstand the constant heavy trucking of freight elevator traffic.

Peelle Motorized Freight Elevator Doors increase the efficiency of freight elevators and provide automatic door operation in coordination with the elevator control.

Peelle Truckable Sills—The upper edge of each lower leaf is equipped with a reinforced sill. These sills close the space between the shaft wall and the elevator platform, and are called "Truckable Sills". The trucking loads to and from the elevators are supported by the truckable sills.

The design of Peelle Truckable Sills varies according to the capacity of the elevator, width of the opening, and other factors.

Interlocks—Peelle Freight Elevator Doors are supplied with electric interlocks to suit the control of the elevator, and to meet the code requirements of the authorities having jurisdiction. Car switch controlled elevators may have contacts that require all doors to be closed before the elevator can be operated, or interlocks that require all of the doors to be closed and locked before the elevator car can be operated. An emergency release switch is usually installed on car switch controlled elevators so that the elevator can be operated with the doors open in case of emergency.

The latches on doors for car switch controlled elevators are normally operative from the shaft side only. If required, the latches may be arranged to operate from the room side with a removable key to permit emergency access to the shaft.

Constant pressure push button controlled elevators are usually equipped with a contact, or interlock, and a mechanical lock operated with a stationary cam on the elevator. Automatic push button controlled elevators are usually equipped with interlocks operated with a retiring cam on the elevator. All push button controlled elevators are equipped with latches that permit the opening of the shaft doors from either the shaft, or room side of the door, at which the elevator is at rest.

Special Locks—Peelle Doors may be specified to have cylinder locks which will prevent access to the room from the elevator, or access to the elevator from the room, when the door has been locked. If, with the cylinder lock key, the doors are motorized, the same key switches off the door motors when the door has been locked with the cylinder lock key.

Shaft Opening Frames—Channel iron frames and sills are recommended for all freight elevator shaft openings. Shafts constructed of hollow building blocks must have channel iron frames, with the vertical or jamb members extending from floor beam to floor beam. Shafts constructed of at least 8-in. brick or 8-in. solid concrete may have channel iron frames with the vertical (or jamb) members extending from floor beam to lintel only, but the continuous jamb members are preferable.

Peelle Car Gates—Peelle Car Gates are placed on the elevator car and protect the open sides of the elevator car while the car is in motion. Car gates are usually motorized and when used in conjunction with motorized doors they are operated from a common control.

Peelle Dumbwaiter Doors

Peelle Dumbwaiter Doors consist of two vertically sliding leaves, one balancing the other. The upper leaf slides up while the lower leaf slides down. The doors are completely assembled to a frame with trim, shelf, and all hardware, ready for setting into the masonry wall.

Peelle Industrial Entrance Doors

Peelle Industrial Entrance Doors are used at openings in garages, and at platforms or receiving entrances in commercial or industrial buildings. On account of their large size and in order to provide remote control, these doors are usually motorized.

Horizontal Slide, Vertical Slide (Telco), or Bi-Folding types are used, depending upon the space available. Preference where possible should be given to the types in the order mentioned.

SELECTING PEELLE DOORS

Peelle Doors for three classes of openings are shown on pages 2 and 3 in the form of a pictorial index. This index will facilitate the selection of a door for the door opening that the catalogue user may have in mind.

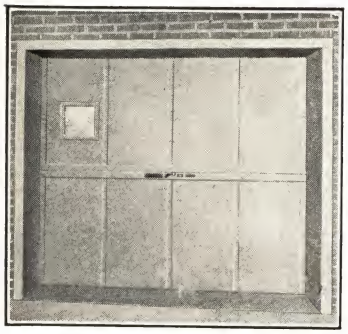
This index refers the reader to succeeding pages, where complete explanations, construction details, and specifications for each of the doors illustrated may be found.

The door designs shown in the index are for the purpose of illustration only. All Peelle Doors can be executed in any architectural design in any of the commercial metals or alloys, in hollow metal, in sheet metal over wood, or in solid wood.

The term "spandrel height" as used in this catalogue refers to the distance from the bottom of the finished lintel of a shaft opening, to the finished sill of the shaft opening above.

PICTORIAL INDEX

PEELLE FREIGHT ELEVATOR DOORS



Regular Type

Regular Type doors are used wherever spandrel heights above and below the openings in the shaft are of sufficient height to provide unobstructed space for the doors to open fully. The minimum spandrel height must be equal to one half the opening height plus 6 ins.

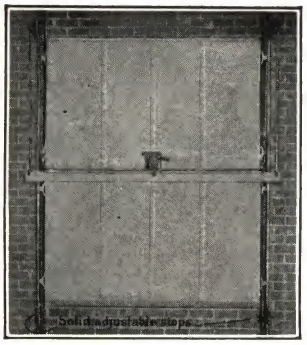
These doors operate in one vertical plane.

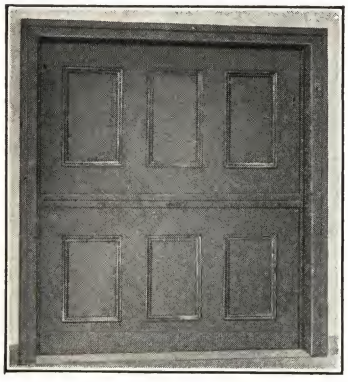
The guides are continuous. The upper leaf of one door operates in the same guide as the lower leaf of the door above, and vice versa. Only one door in a series is open at a time.

See pages 4 and 5 for construction details.

See page 14 for specifications.

See page 10 for shaft opening frames.





Pass Type

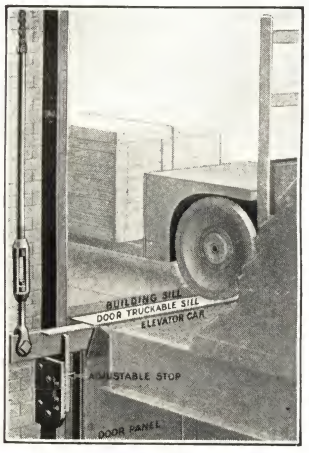
Pass Type Doors may be used where spandrel heights above and below openings are insufficient to take each door leaf when opened, without encroaching on the openings above and below. The minimum spandrel height required is 10 ins.

The two leaves of each door operate in separate vertical planes, each leaf having separate guides. This construction permits the lower leaf of one door to pass in front of the upper leaf of the door below, while the upper leaf passes behind the lower leaf of the door above. The space between the upper leaf of each pass type door and the shaft wall at the lintel is closed with a hinged movable lintel.

See pages 6 and 7 for construction details.

See page 14 for specifications.

See page 10 for shaft opening frames.



Self-Sealing Type

Self-Sealing Type Doors may be used for any shaft opening where the spandrel height is at least 18 ins.

Both leaves of Self-Sealing Doors when closed make actual contact with the frame of the shaft opening at both sides, top, and bottom.

Self-Sealing Doors effectually seal the shaft openings against draughts, sounds, odors, dust, and smoke.

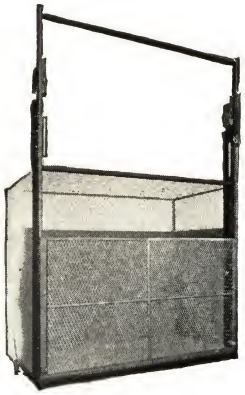
When opening, the leaves have an offsetting motion so that, when the spandrel height is less than half the opening height plus 6 in., the doors will overlap the shaft doors above and below on the shaft side.

Self-Sealing Doors are recommended for use on service elevators in office buildings, hotels, department stores, and hospitals, as well as for general freight elevator use.

See pages 8 and 9 for construction details.

See page 14 for specifications.

See page 10 for shaft opening frames.



Peelle Elevator Car Gates

Peelle Elevator Car Gates are made in a single vertically sliding unit and are counterbalanced with weights. The necessary guides are erected on the car platform and these must be the height of the shaft opening plus the height of the gate. Car gates are usually 6 ft. high unless otherwise required by safety codes.

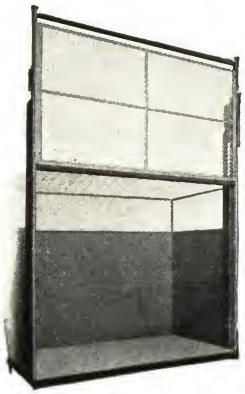
Peelle Car Gates are constructed of 11-gauge wire mesh, set into steel angle frames with vertical and horizontal reinforcements.

Peelle Car Gates are usually motorized in all cases. When used in conjunction with motorized doors, the gates open and close simultaneously with the doors, and are controlled from the same push buttons.

Car gates, when used in conjunction with manually operated doors, should be motorized so that the elevator operator will not lose the time required to operate the car gates.

See page 12 for construction details.

See page 14 for specifications.



PICTORIAL INDEX

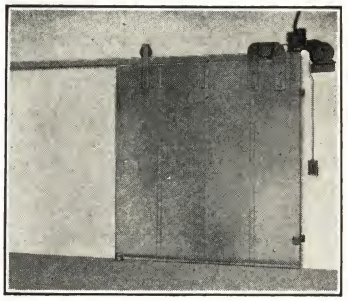
PEELLE ENTRANCE DOORS

Horizontal Slide Type

This is the simplest type of entrance door, where the space conditions permit its use. The minimum clear height required over the opening is 13 in., and the horizontal dimension on one side must equal the opening, plus 6 in., and 6 in. is required on the opposite side.

There are practically no limitations to the design of these doors or the materials from which the doors are made.

The most practical and economical construction for these doors is wood.



Telco Slide Type

Peelle Telco Doors are made in two leaves counter-balanced by weights. They slide up at a ratio of 2 to 1. This type of door is recommended wherever there is sufficient space overhead and at the jambs to permit its installation.

The overhead clearance required for the installation of this door is one half the opening height plus 19 in. The minimum jamb clearances are 4 in. on one side, and 12 in. on the opposite side, for doors under 15 ft. 0 in. wide. For doors exceeding 15 ft. 0 in. in either width or height, refer to the Peelle Company for space requirements.

These doors are usually motorized, but may be made for manual operation.

See page 17 for construction details and specifications.

Bi-Fold Doors

Bi-Fold Doors consist of two leaves horizontally hinged to each other, the upper leaf being also hinged to the head of the opening. The leaves fold together as they swing up while opening. The minimum clear spaces required for Bi-Fold Doors are given in a table on page 18.

These doors are recommended wherever space limitations prevent the use of either a Horizontal Slide or a Telco Slide Door.

These doors may be motorized, or manually operated.

See page 18 for details and specifications.

PEELLE DUMBWAITER DOORS

The Peelle Dumbwaiter Door unit is a counter balanced door mounted in steel guides with a combination pressed metal frame and trim. The entire unit is assembled in the factory, ready for building into the masonry wall while the shaft is being built.

The door operates on the inside of the shaft, and takes up no floor space in opening or closing. It may be adapted to any floor plan without confliction. Each door has a 6-in. observation light so that the dumbwaiter is visible with the door closed.

The doors are insulated to eliminate noise. The standard door is furnished with a flush panel design, but may be made to special designs if required.

See page 15 for construction details and specifications.

PEELLE FREIGHT ELEVATOR DOORS

REGULAR TYPE

Construction Details

The details shown on this and the following page are for the purpose of showing the construction of the doors and the spaces required in the elevator shaft for the installation of Regular Type Doors.

Spandrel Heights—The minimum spandrel height is one half the opening height plus 6 ins. The minimum spandrel heights are the same for motorized, or manually operated doors. Where Regular Type Doors are used, the spandrel height at one floor limits the height of the opening at that floor, and also the height of the opening at the floor immediately above.

Jamb Return Space—The minimum jamb return is measured horizontally on the inside of the shaft, from the jamb of the opening to the return wall or nearest obstruction. The minimum jamb return for manually operated Regular Type Doors varies from 7 to 9 ins., and for Motorized Doors it varies from 10 to 12 ins. In special cases where these jamb returns are not available, consult THE PEELLE COMPANY. See "Schedule of 'A' Dimensions" on opposite page for standard minimum jamb returns.

Car Clearance—Is the distance from the flush shaft wall to the edge of the elevator platform. This clearance is 4¾ ins. total for Regular Type Doors, 3½ ins. for the truckable sill of the door, plus 1¼ ins. running clearance for the elevator. The running clearance of the elevator may, in case of emergency, be reduced to ¾ ins., in which case the total clearance would be 4¼ ins. To allow for normal tolerances in shaft construction, 4¾ ins. total clearance should be allowed in all cases wherever possible.

Pit Depth—The minimum pit depth is one half the opening height of the bottom landing shaft opening, plus 3 ins.

For specifications see page 14.

For Design of doors see page 13.

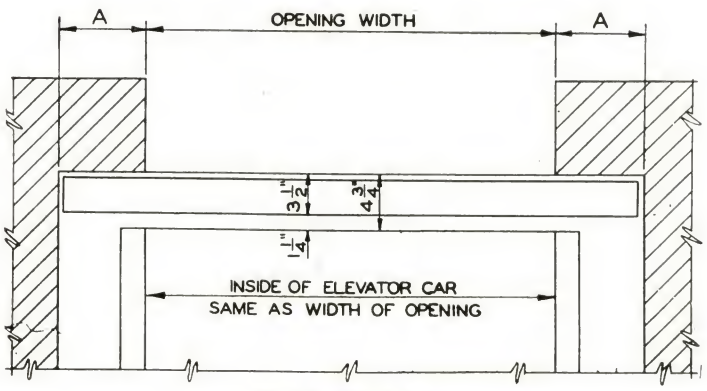
For shaft opening frame details, see page 10.

For interlocks see page 1.

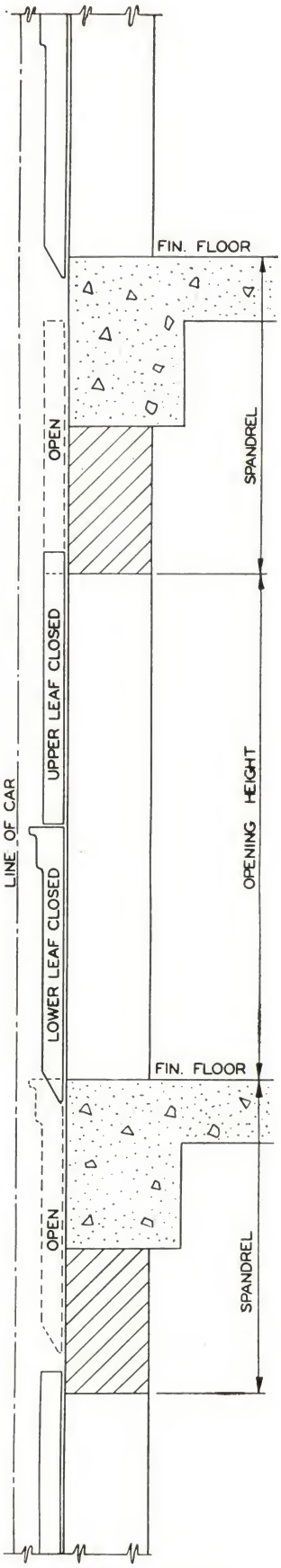
For description of electrical apparatus of motorized doors, see page 11.

For car gates see page 12.

SHAFT ELEVATION



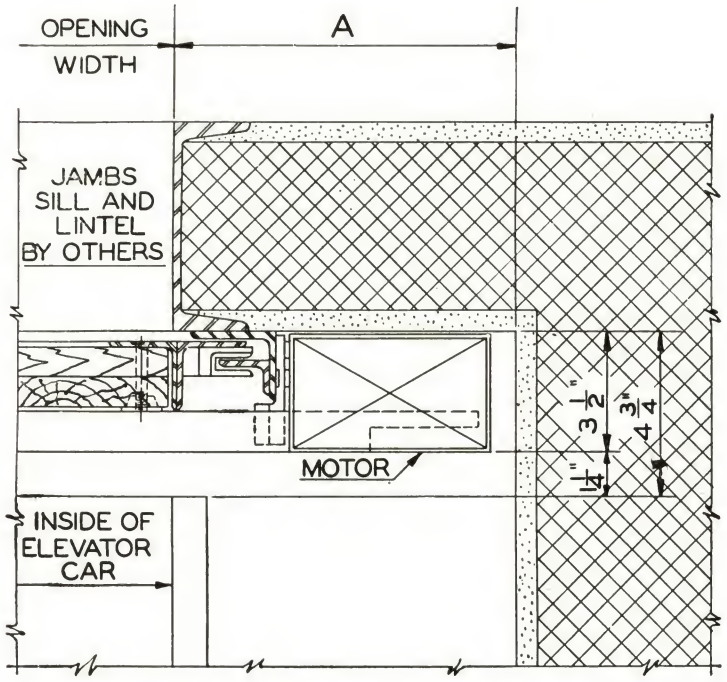
PLAN SECTION



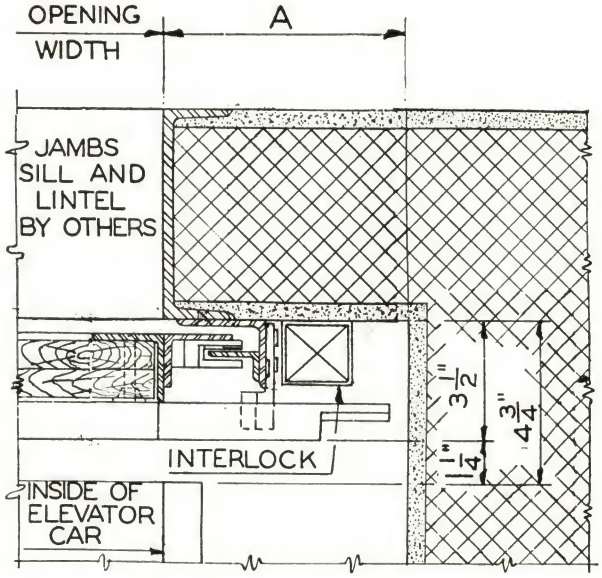
VERTICAL SECTION

PEELLE FREIGHT ELEVATOR DOORS

REGULAR TYPE
Large Scale Details



HORIZONTAL SECTION THRU PEELLE
REGULAR METAL CLAD DOOR
MOTOR OPERATED



HORIZONTAL SECTION THRU PEELLE
REGULAR METAL CLAD DOOR
MANUALLY OPERATED

Schedule of "A" Dimensions
("A" Is Reversible)

Motorized Doors

Any width of opening, car switch elevator, 10 and 11 ins.
Exception—State of California, 10 and 11½ ins.

Any width of opening, push button elevator, 10 and 12 ins.

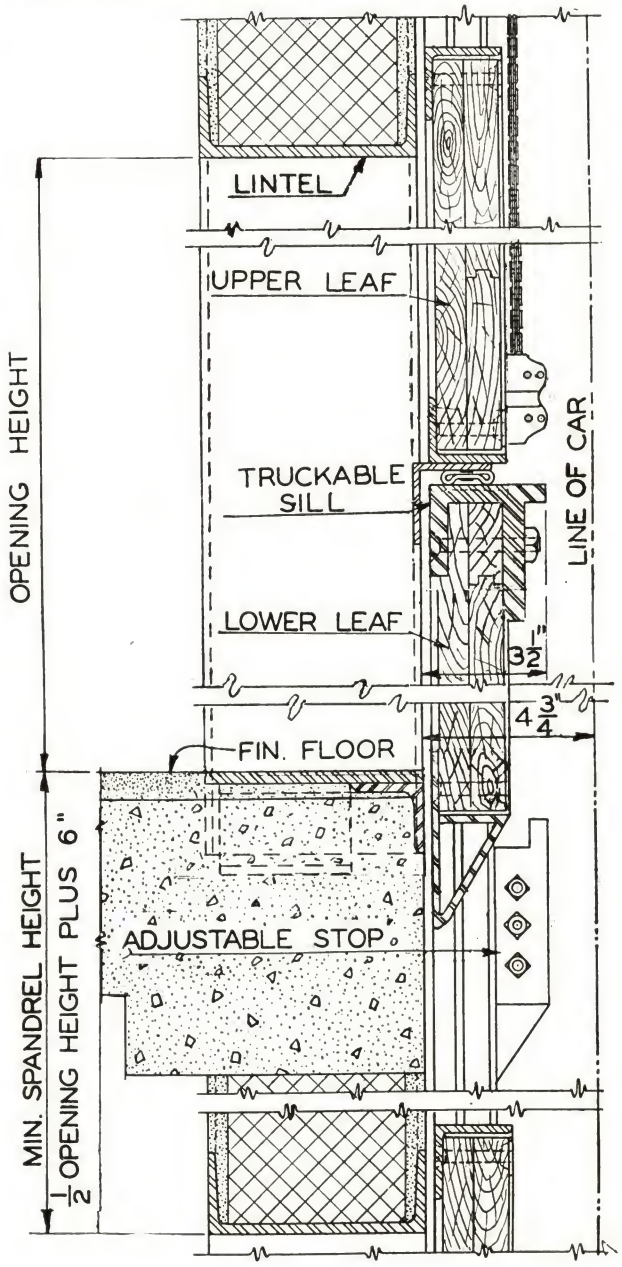
Exception—State of California, 11 and 13 ins.

Manual Doors

Openings up to 8 ft. 0 ins. wide, any elevator, 7 ins each side.

Openings over 8 ft. 0 ins. wide, any elevator, 9 ins. each side.

Exception—"A" may be 7 ins. for openings up to 10 ft. 0 in. wide where 9 ins. is not available.



VERTICAL SECTION THRU PEELLE
REGULAR METAL CLAD DOOR

PEELLE FREIGHT ELEVATOR DOORS

PASS TYPE

Construction Details

The details shown on this and the following page are for the purpose of showing the construction of the doors and the spaces required in the elevator shaft for the installation of Peelle Pass Type Doors.

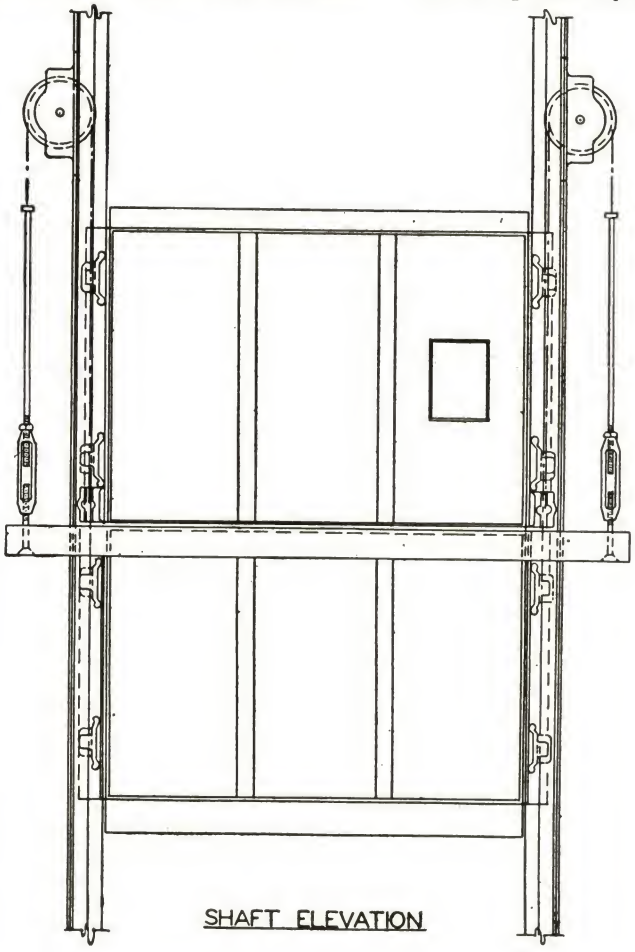
Spandrel Heights—The minimum spandrel height is 10 ins. Pass Type Doors may be used where the spandrel heights are not sufficient for Regular Type Doors. The minimum spandrel heights are the same for motorized, or manually operated doors. Where the variation in the spandrel heights for the same line of shaft doors requires Pass Type Doors at some floors, and Regular Type Doors at other floors, the regular door truckable sills are extended to take up the same space in the shaft as Pass Type Doors. The shaft walls in all cases should be flush the full height of the shaft. Regular Type Doors with extended sills are shown in the vertical section on the opposite page.

Jamb Return—The minimum jamb return is measured horizontally on the inside of the shaft, from the jamb of the opening to the side wall of the shaft or nearest obstruction. The minimum return space for manually operated Pass Type Doors varies from 8 to 10 ins., and for Motorized Doors it varies from 10 to 12 ins. In special cases where these return spaces are not available, consult THE PEELLE COMPANY. See "Schedule of 'A' Dimensions" on opposite page for standard minimum return spaces.

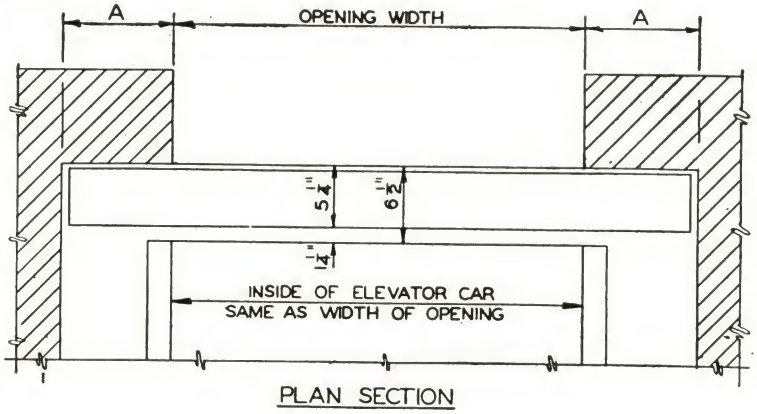
Car Clearance—Is the distance from the flush shaft wall to the edge of the elevator platform. This clearance is 6½ ins. total for Pass Type Doors, 5¼ ins. for the truckable sill of the door, plus 1¼ ins. running clearance for the elevator. The running clearance for the elevator, may, in cases of emergency, be reduced to ¾ in., in which case the total clearance would be 6 ins. To allow for normal tolerances in shaft construction, 6½ ins. total car clearance should be allowed in all cases wherever possible.

Pit Depth—The minimum pit depth is one half the opening height of the bottom landing shaft opening, plus 3 ins.

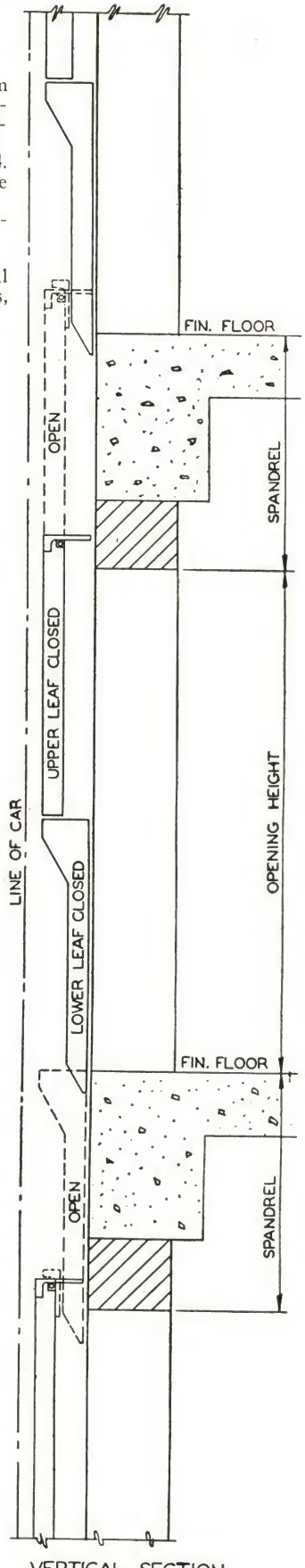
For specifications see page 14.
For designs of doors see page 13.
For shaft opening frame details, see page 10.
For interlocks see page 1.
For description of electrical apparatus for motorized doors, see page 11.
For car gates see page 12.



SHAFT ELEVATION



PLAN SECTION

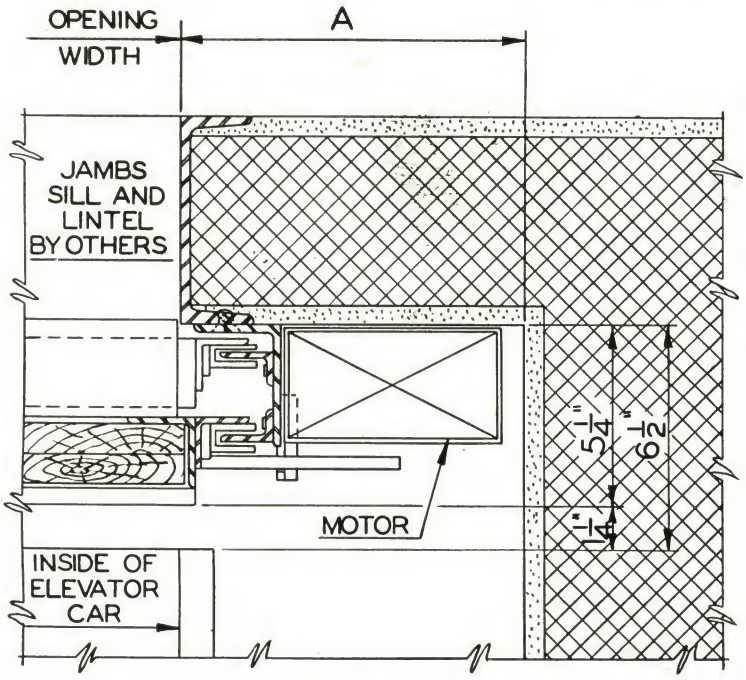


VERTICAL SECTION

PEELLE FREIGHT ELEVATOR DOORS

PASS TYPE

Large Scale Details



HORIZONTAL SECTION THRU PEELLE METAL CLAD PASS TYPE DOOR MOTOR OPERATED

Schedule of "A" Dimensions
("A" Is Reversible)

Motorized Doors

Any width of opening, car switch elevator, 10 and 11 ins.

Exception—State of California, 10 and 11½ ins.

Any width of opening, push button elevator, 10 and 12 ins.

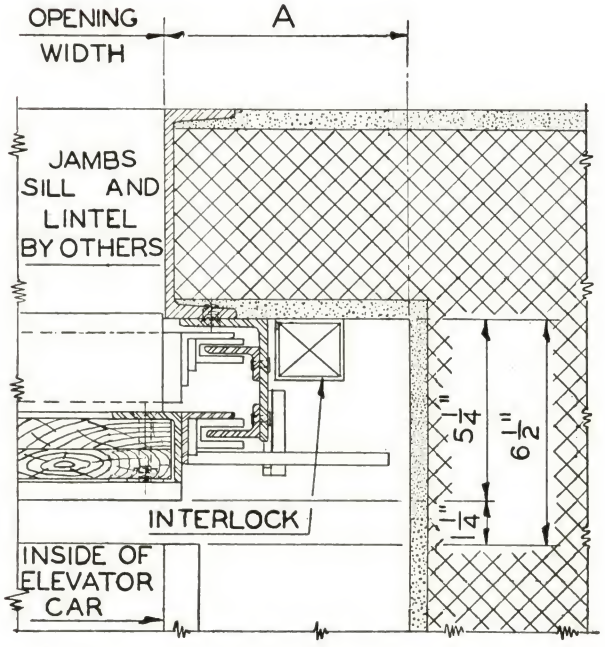
Exception—State of California, 11 and 13 ins.

Manual Doors

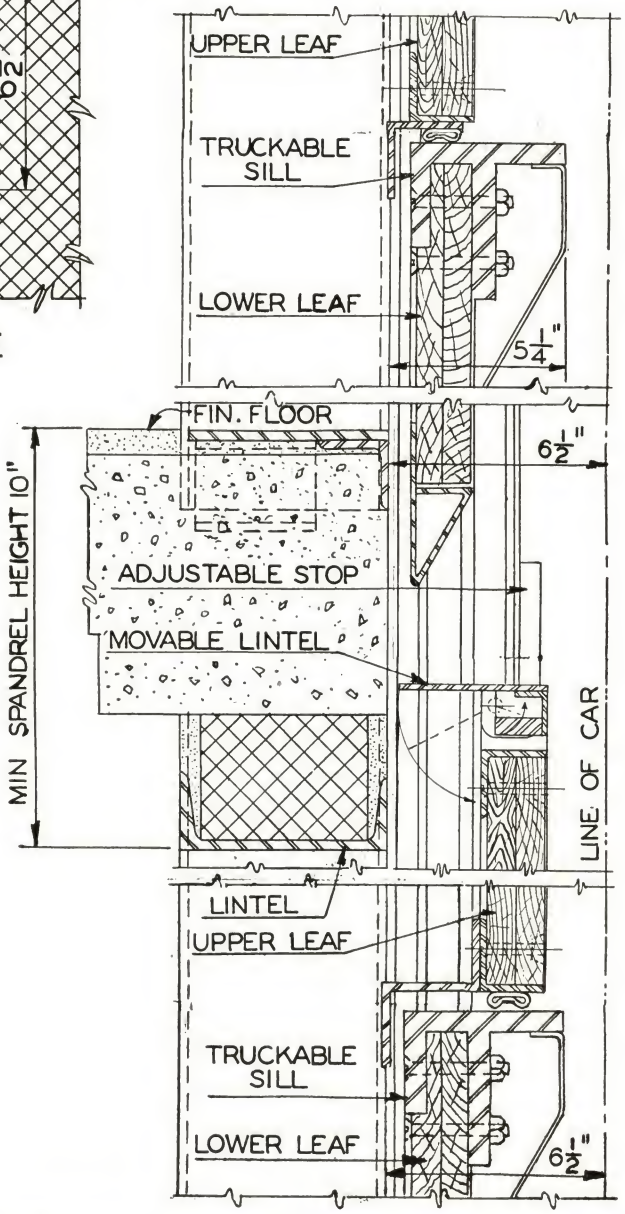
Openings up to 8 ft. 0 ins. wide, all elevators, 8 ins. each side.

Openings over 8 ft. 0 ins. wide, all elevators, 9 ins. each side.

Exception—"A" may be 8 ins. for openings up to 10 ft. 0 in. wide where 9 ins. is not available.



HORIZONTAL SECTION THRU PEELLE METAL CLAD PASS TYPE DOOR MANUALLY OPERATED



VERTICAL SECTION THRU PEELLE METAL CLAD PASS TYPE DOOR SHOWING EXTENSION SILL ON REGULAR DOOR ABOVE

PEELLE FREIGHT ELEVATOR DOORS

SELF-SEALING TYPE
Construction Details

The details shown on this and the following page are for the purpose of showing the construction details and the spaces required in the shaft for the installation of Peelle Self-Sealing Doors.

Spandrel Heights—The minimum spandrel height is 18 ins. for either mortorized or manually operated doors.

Jamb Return—The minimum jamb return is measured horizontally on the inside of the shaft, from the jamb of the opening, to the side wall, or nearest obstruction. The minimum jamb return for manually operated Self-Sealing Doors is 8 ins. at each jamb, and for Motorized Doors varies from 10 to 12 ins. In special cases where these return spaces are not available, consult THE PEELLE COMPANY. See "Schedule of 'A' Dimensions" on opposite page for standard minimum return spaces.

Car Clearance—Is the distance from the flush shaft wall, in which the openings occur, to the edge of the elevator platform. This clearance is 6½ ins. total for Self-Sealing Doors, 5¼ ins. for the truckable sill of the door plus 1¼ ins. running clearance for the elevator. The running clearance for the elevator, may, in case of emergency, be reduced to ¾ in. in which case the total clearance would be 6 ins. To allow for normal tolerances in shaft construction, 6½ ins. total clearance should be allowed in all cases wherever possible.

Pit Depth—The minimum pit depth is one-half of the bottom landing shaft opening height plus 3 ins.

For specification see page 14.

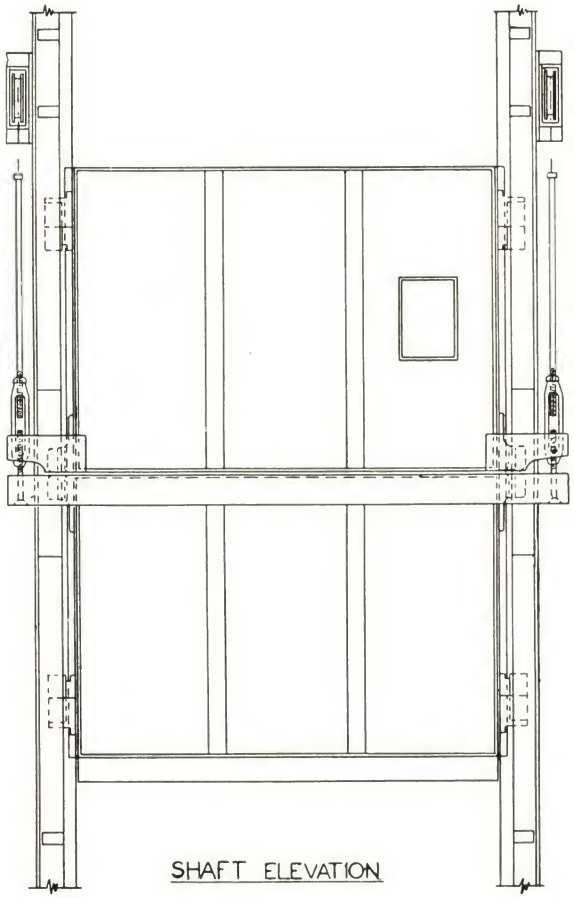
For design of doors see page 13.

For shaft opening frame details, see page 10.

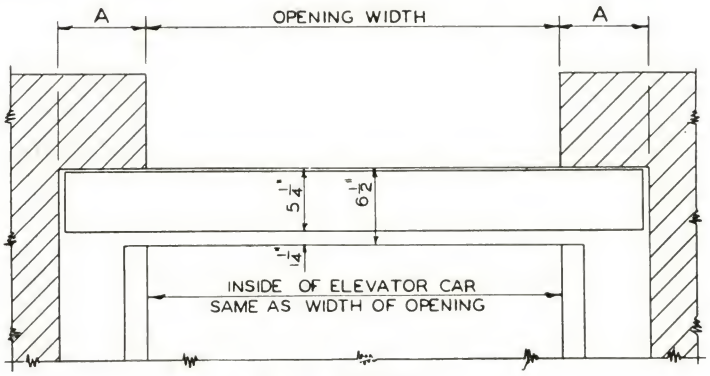
For interlocks see page 1.

For description of electrical apparatus for Motorized Doors, see page 11.

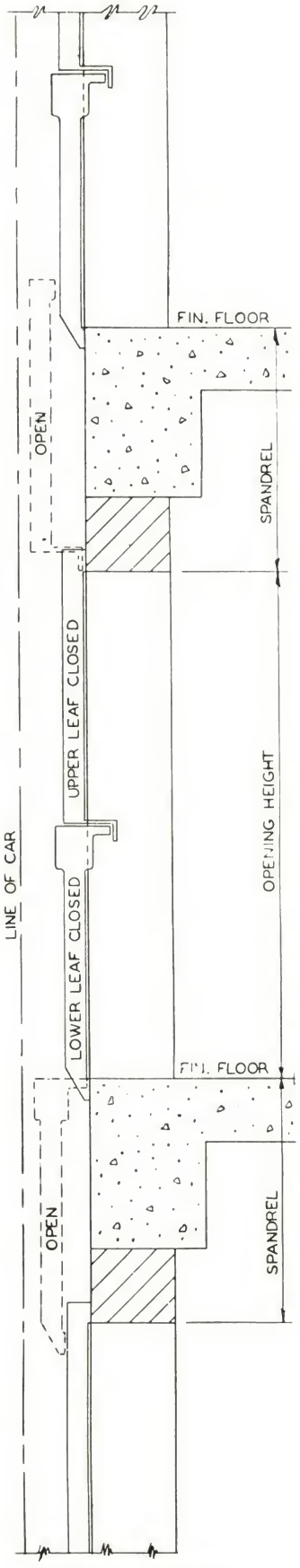
For car gates see page 12.



SHAFT ELEVATION



PLAN SECTION

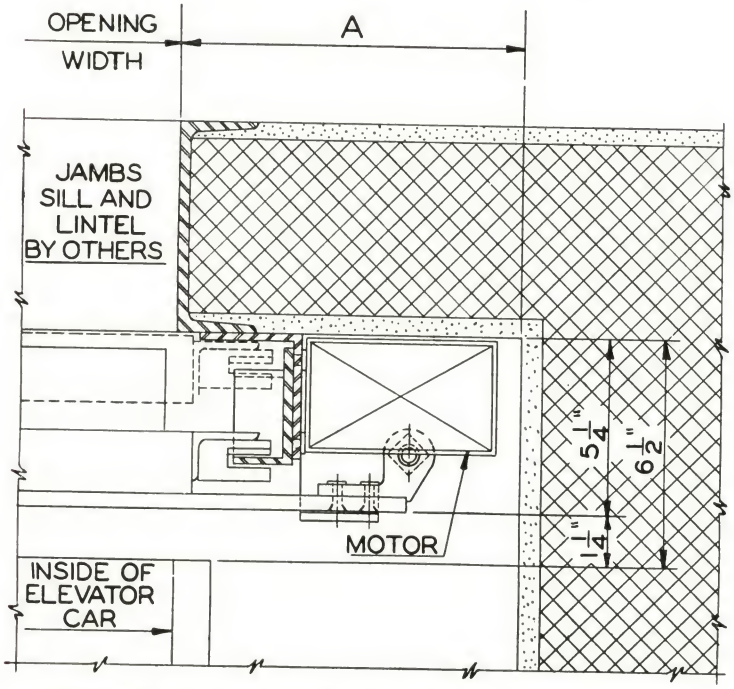


VERTICAL SECTION

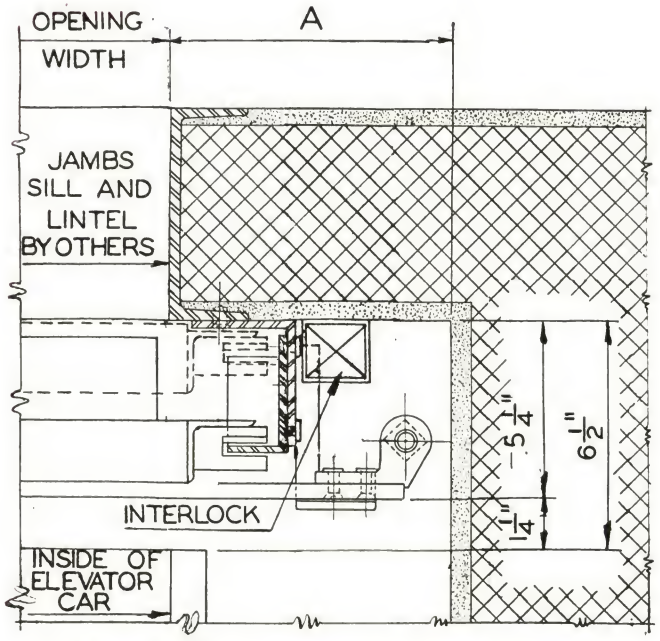
PEELLE FREIGHT ELEVATOR DOORS

SELF-SEALING TYPE

Large Scale Details



HORIZONTAL SECTION THRU PEELLE
SELF SEALING DOOR
MOTOR OPERATED



HORIZONTAL SECTION THRU PEELLE
SELF SEALING DOOR
MANUALLY OPERATED

Schedule of "A" Dimensions
("A" Is Reversible)

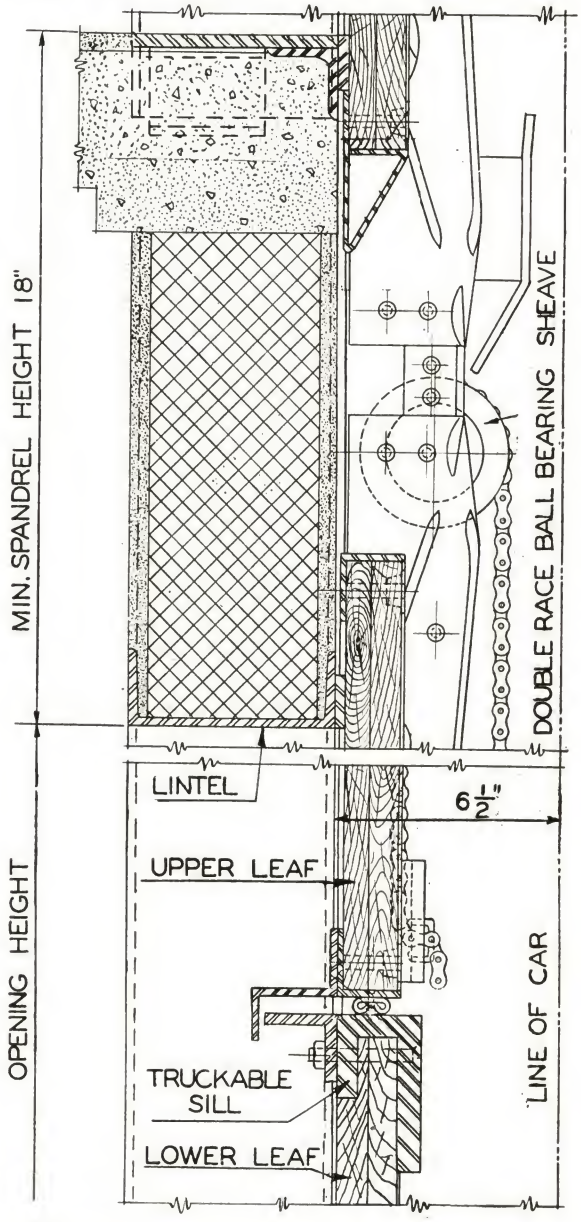
Motorized Doors

Any width of opening, car switch elevator, 10 and 11 ins. Exception—State of California, 10 and 11½ ins.

Any width of opening, push button elevator, 10 and 12 ins. Exception—State of California, 11 and 13 ins.

Manual Doors

Openings up to 8 ft. 0 in. wide, all elevators, 8 ins. each side. Openings over 8 ft. 0 in. wide, all elevators, 9 ins. each side. Exception—"A" may be 8 ins. for openings up to 10 ft. 0 in. wide where 9 ins. is not available.



VERTICAL SECTION THRU PEELLE
SELF SEALING DOOR SHOWING
DOOR IN CLOSED POSITION

PEELLE FREIGHT ELEVATOR DOORS

SHAFT OPENING FRAMES

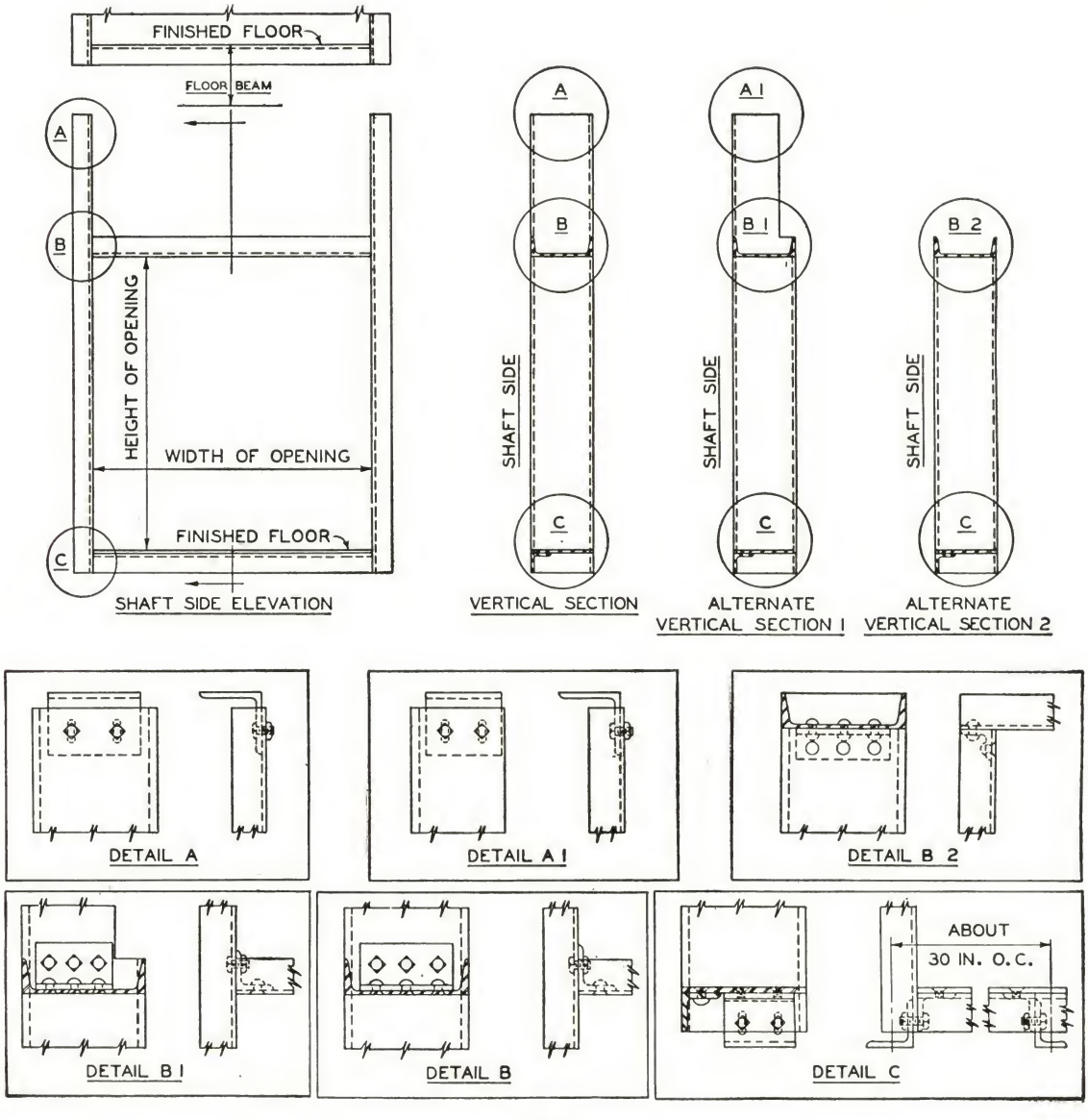
Although the shaft opening frames for Peelle Doors are usually furnished by the miscellaneous iron contractor, this sheet of details is submitted to help the architect design the shaft openings to obtain the best practical results. Steel frames in the shaft openings not only provide a substantial fastening for the door guides, but also provide an accurate base, or datum from which the door manufacturer may work. Steel frames also protect the masonry from damage by heavily loaded trucks.

The upper left hand corner "shaft side elevation" shows a typical frame. Shaft opening frames are usually constructed of channels 1 in. deeper than the thickness of the masonry wall. This allows for plastering if required. Freight elevator shafts are seldom plastered on the shaft side, and only occasionally on the room side. Where the outside of the shaft wall is not plastered, it should be specified that the masonry contractor should point up between the leg of the channel and the wall around the opening. Frames may, if desired, be exactly the same depth as the masonry, but this construction requires considerable labor to cut the masonry to fit the channels. Whether the frames are constructed of channels 1 in. deeper than the masonry wall, or the same depth, the finished shaft is measured from the shaft side face of the channel leg.

"Vertical Section" shows a frame where it is not intended to plaster the room side of the shaft.

"Alternate Vertical Section 1" shows a frame where it is intended to plaster the room side of the shaft. Note the room side leg of the channel is cut out above the lintel. This construction reveals the frame only around the opening on the room side. The "Alternate Vertical Section 2" at the upper right hand corner shows a frame where the vertical, or jamb members extend to the lintel only. This construction is permissible where the shaft is constructed of at least 8-in. brick, or 8-in. concrete.

The details at the lower left of the page suggest methods of construction. These details may be modified to suit the standard practice of the fabricator.



PEELLE FREIGHT ELEVATOR DOORS

MOTORIZED DOORS

Description

PEELLE MOTORIZED DOORS

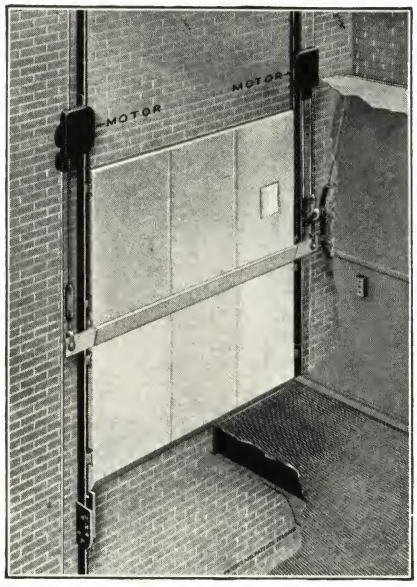
The Peelle Motorized Freight Elevator Door is an electrically operated freight elevator door that has the driving mechanism built into each sheave housing, and is an integral part of the door.

A pair of motorized sheaves exert the power for opening and closing each door. The power is applied directly to the chains which connect the two halves of the door. All rods, arms, and auxiliary devices are eliminated. There are no unnecessary moving parts, therefore all of the power consumed is applied to the door.

The Peelle Motorized Door eliminates dividing the responsibilty between a door manufacturer and a door operator manufacturer.

The Peele Motorized Door may be operated manually at will. In cases of emergency, when manual operation is essential, elevator traffic continues without interruption. It is not necessary to disconnect any of the mechanical or electrical parts. During manual operation, the same automatic electro-mechanical locking features are retained.

The equipment is fully protected electrically, which eliminates the possibility of injuring the motors.



Shaft Side View of Peelle Motorized Door

Construction

The Peelle Motorized Sheaves have a large factor of safety and are assembled in heavy malleable iron housings. The motors are completely enclosed and protected from dust, dirt, and all foreign matter. All bearings have ground rollers with inner and outer ground races. All bearings are sealed at the factory after being packed with a semi-fluid lubricant. Provision is made for gun lubrication.

Standardization

Peelle Motorized Sheaves are standardized, produced in quantities, and carried in stock at all Peelle Branch Offices. The same Peelle Motorized Sheaves are used for either alternating or direct primary current. When available, 220-volt 3-phase 60-cycles a-c. is preferred.

Control

The doors may be controlled in any manner that the elevator control or other conditions demand. The doors are usually opened automatically as the elevator is leveling, or with a momentary push button, when independent of the elevator control. The doors are usually closed with a constant pressure push button. The closing operation may also be controlled by the elevator car switch. A stop button is always provided to stop the doors in any position of opening or closing. Suitable automatic electro-mechanical interlocks, and cams are provided to meet state or municipal codes having jurisdiction. The interlocks require all doors to be closed before the elevator can operate, and that, only the door at which the elevator is at rest, or leveling, will open.

Cost of Operation

The cost of operating Peelle Motorized Doors is extremely economical. Each door consumes ½ kv-a. The current is across the line approximately 3 seconds per operation for an 8-ft. high opening.

Maintenance

The cost of maintenance will not go beyond the periodical greasing that is customarily given to elevator equipment.

Space Requirements

To install Peelle Motorized Doors, no provision for extra space is required. The space between the elevator and the shaft wall is the same as for manual doors. In the penthouse, no equipment is required that interferes with the elevator machine and controller layout. Service power lines, a cutout switch having 15 amp. fuses, for each line of doors is all that need be provided by others.

When to Use Peelle Motorized Doors

Peelle Motorized Doors may profitably be used where any of the following conditions exist:

All freight elevators having a speed of 150 ft. per minute or greater. The advantage of high elevator speed is lost unless the Peelle Doors are motorized.

On all self leveling elevators. Peelle Motorized Doors open while the elevator is leveling, thereby gaining considerable time over manual operation.

On all freight elevators having continuous traffic. Peelle Motorized Doors open immediately upon the arrival of the elevator at its destination. The opening and closing of the doors is not dependent upon the physical endurance of the elevator operator. As the fatigue of the elevator operator increases, the speed of the elevator traffic decreases when manually operated doors are used.

On all automatic push button controlled freight elevators. The cost of automatic elevators is justified only when used in conjunction with Peelle Motorized Doors.

On all elevators having doors at both ends of the shaft. Saves the time of the elevator operator walking to the door opposite the elevator car control.

On all elevators used for carrying freight that completely fills the elevator platform, which would make the latch of a manually operated door inaccessible to the elevator operator. Elevators may be loaded to capacity when the doors are motorized.

See pages 4 to 9 for space requirements.

See page 12 for car gates.

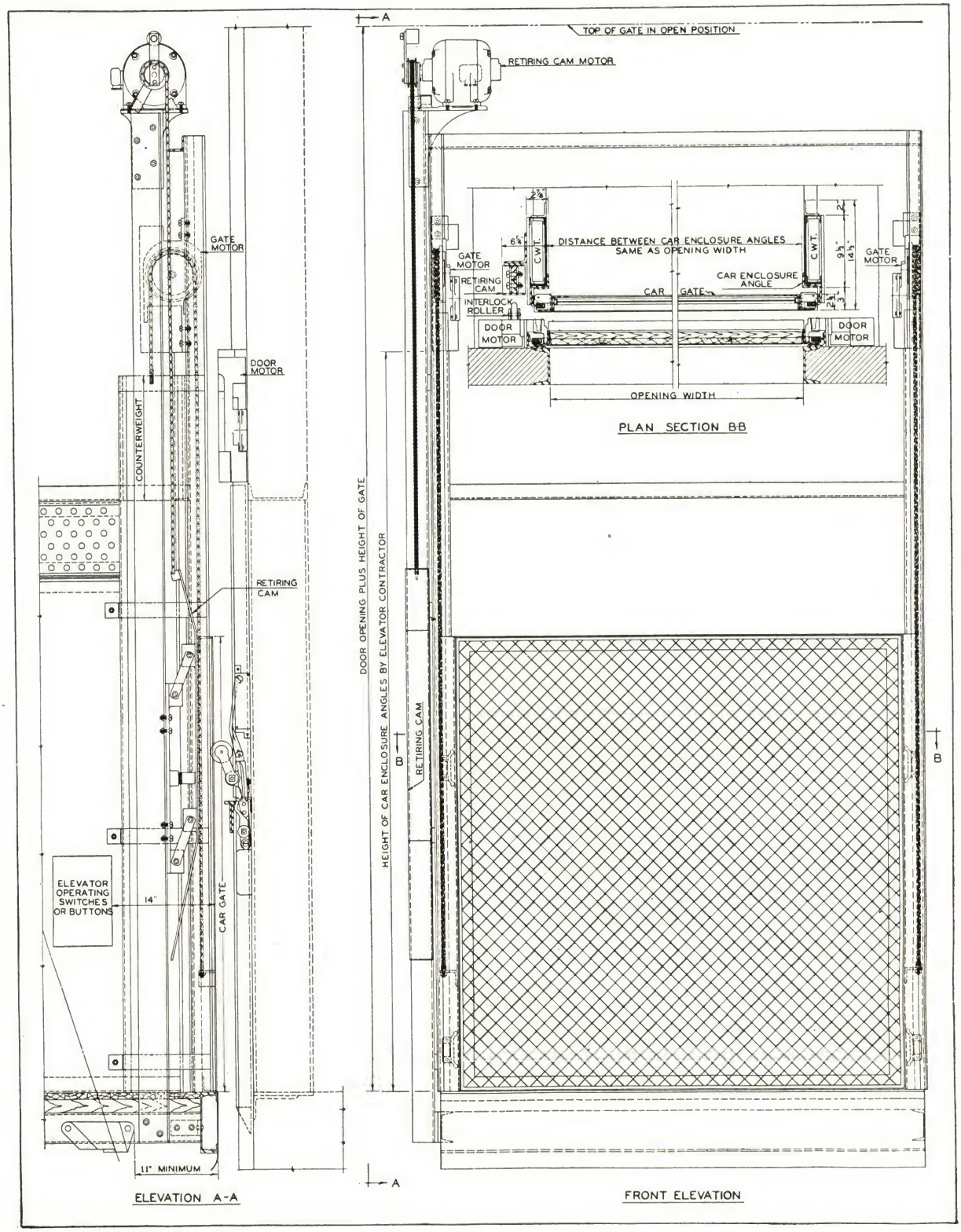
PEELLE FREIGHT ELEVATOR DOORS

ELEVATOR CAR GATES

The drawings on this page are for the purpose of showing the construction details and spaces required for the installation of a Peelle Motorized Car Gate. Manual car gates require the same space. The drawings show a Peelle Motorized Car Gate installed on the elevator car. The vertical section at the left, and the plan section above, also show a Motorized Door, interlocks, and retiring cam. Peelle Motorized Car Gates require a minimum amount of weight on the elevator car, thereby reducing the sheave shaft load of the elevator machine.

For specifications see page 14, pars. nos. 7, 11 and 13.

For door space requirements see pages 4 to 9.



PEELLE FREIGHT ELEVATOR DOORS

DOOR DESIGNS

Peelle Freight Elevator Doors Can Be Made to Any Desired Architectural Design

Door Designs

Peelle Freight Elevator Doors can be made to any desired architectural design.

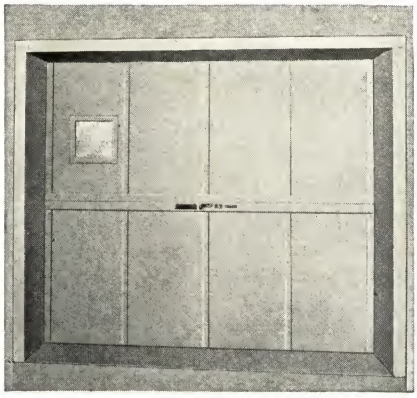
Standard Designs

Four standard designs are shown on this page which have been found to be very generally useful.

Designs R-9, or R-10, are standard for use in industrial buildings, where fine finish is not a consideration. The other designs show panelled doors which are suitable in the large majority of cases.

All standard designs apply equally to all types of Peelle Freight Elevator Doors.

Peelle Doors for service and freight elevators in office buildings, hotels, department stores, hospitals, sanitariums, etc., are frequently built to architectural designs harmonizing with the surrounding decorations.



R-10 Galvanized Metal Covered Door, with Flush Panels

R-9 without observation light
R-11 with two observation lights

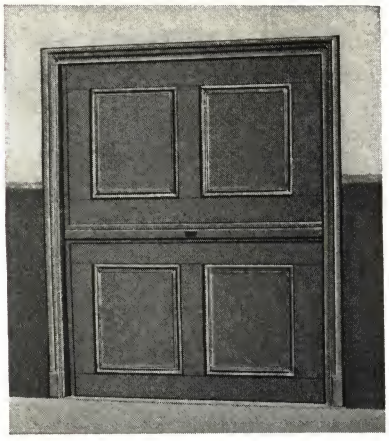
General Features

Glass—The legal maximum glass surface in any one door panel is 144 sq. in. except for exterior doors which may have larger glass area.

All doors having observation lights are furnished including the glass. Doors having glass of a larger area than observation light are not furnished with the glass.

Underwriters' Label—The label of the Underwriters' Laboratories can be furnished on all Peelle Freight Elevator Doors. In such doors one 8 in. x 10 in. clear wire glass panel is standard, or two glass panels, the total area not exceeding 144 square inches.

Painting—All standard metal doors and hardware, except the galvanized covering, receive one shop coat of metallic primer. Special painting, enamel or grained finish will be done when so specified.



K-1 Kalamein Panelled Door, Two Solid Panels in Each Half

K-3 Kalamein Panelled Door, Three Solid Panels in Each Half

O-9 Kalamein Panelled Door, With Standard Size Steel Sash in the Upper Half

Special Designs

We desire to emphasize that there is no need for the architect, because of any esthetic reason, to hesitate using Peelle Freight Elevator Doors. We are prepared to execute designs in bronze, rust resisting steel alloys or any other metal, plain or ornamental, in accordance with the best standards of craftsmanship in use in the metal covered, hollow metal or ornamental metal trades.

Any desired finish whether to specifications or to sample may be obtained, including any kind of paint, enamel, baked enamel, imitation wood grained or special metal finish.

PEELLE FREIGHT ELEVATOR DOORS

SPECIFICATIONS

1. Furnish, deliver, and erect in complete working order, counterbalanced freight elevator doors and appurtenances, as manufactured by THE PEELLE COMPANY, 47 Stewart Avenue, Brooklyn, New York, where indicated on the drawings, and in accordance with the following specifications.

2. Steel frames and sills for the freight elevator door openings are specified elsewhere.

3. Finish painting for the freight elevator doors is specified elsewhere.

4. Electric service supply of 220-volts (or specify if otherwise), 3 phase, 60 cycle, in the penthouse, for the use of the freight elevator door contractor is specified elsewhere.

5. The doors shall be constructed of two-ply selected white pine, nailed, and covered with 24 gauge stretcher leveled, copper bearing steel, galvanized sheets (specify), design. The doors shall be bolted into steel angle frames, with special bulge head bolts, and malleable iron, flush type combination, one piece nuts and washers. Each upper door shall have an astragal to cover the meeting rail the full width of the opening. The doors shall have angle shoe bars, and malleable iron, milled groove shoes. The doors shall have movable lintels where pass type doors are required. The upper edge of each lower door shall have a T-bar Truckable Sill capable of supporting a trucking load equal to the capacity of the elevator. When the door is open, the Truckable Sill shall rest on malleable iron adjustable stops, which shall be entirely within the shaft, and securely riveted to the guides. The doors shall run in steel guides, and each pair connected with ⅝-in. adjustable turnbuckle rods, and No. 6 rust proof flexible cable chain, running over malleable iron turned groove double race ball bearing sheaves, mounted on the guides in malleable housings.

6. The doors shall be of the Self-Sealing Type, so designed that both leaves of each door when closed make contact with the shaft opening frame at both jambs, lintel, and sill.

NOTE: If Self-Sealing Doors are not required, omit Par. 6.

If car gates are not required, omit Pars. 7 and 11.

If Motorized Doors are not required, omit Pars. 4, 10, 12 and 13.

7. (Optional)—Vertical sliding steel gates shall be installed at the open end of each elevator car. The car gates shall be constructed of 10 gauge, 1½-in. diamond wire mesh, having channel and angle iron frames, and equipped with malleable iron milled groove shoes.

The gates shall be of regulation height, and shall run in steel guides, connected to counterweights with No. 6 rust proof cable chain, running over malleable iron turned groove sheaves. The counterweights shall run in steel guides, fully enclosed.

8. The doors shall be of the manufacturer's (specify) design.

9. The doors shall be equipped with a complete interlocking system which will prevent the operation of the elevator unless all of the doors are closed and locked. The interlocking system shall be designed to suit a (specify type) controlled elevator, and shall conform to the regulations of all state and municipal authorities having jurisdiction, and the requirements of the Underwriters.

10. Each door shall be equipped with electric operation, having individual motors for each door. The operators shall drive both sheaves of each door, and shall be installed entirely within the elevator shaft. The operators shall be designed to provide manual operation without disconnecting any of the electrical or mechanical parts, and provide emergency exit from the shaft, accessible from the elevator. The operators shall be rigidly supported to the steel framing or masonry, and shall have no projections, or moving arms, within the area of the doorway, either on the inside or outside of the shaft. All parts requiring lubrication shall be fully enclosed to prevent grease drippings. All moving parts and sprockets shall be fully enclosed with safety guards.

11. The car gates shall be equipped with individual electric operators similar in design and construction as specified for the freight elevator doors.

12. A push button station for each line of doors marked "open", "close", and "stop", shall be placed on the elevator within easy reach of the elevator operator. The doors shall be arranged to open automatically as the elevator arrives at a landing. Momentary pressure of the "open" button shall open a door that has been closed without the elevator having been moved. Momentary pressure of the "stop" button shall stop the doors in any position. Constant pressure of the "close" button shall close the doors. Limit switches shall terminate the open operation of the doors. Provision shall be made for opening and closing the doors from the room side of the bottom terminal landing.

13. The car gates shall operate simultaneously with the doors, and shall be controlled automatically from the door control stations.

14. This specification includes all of the wiring to make a complete installation.

15. All material, except the metal covering on the doors, shall have one shop coat of approved metallic primer.

16. The freight elevator door contractor shall cooperate with other trades to obtain the most practical working conditions.

17. Complete shop drawings shall be submitted for approval before manufacturing.

18. The entire installation shall conform to the regulations of all state, and municipal authorities, having jurisdiction, and the requirements of the Underwriters.

19. The entire installation shall be guaranteed by the manufacturer for a period of two years against defects in workmanship and materials.

PEELLE DUMBWAITER DOORS

Description

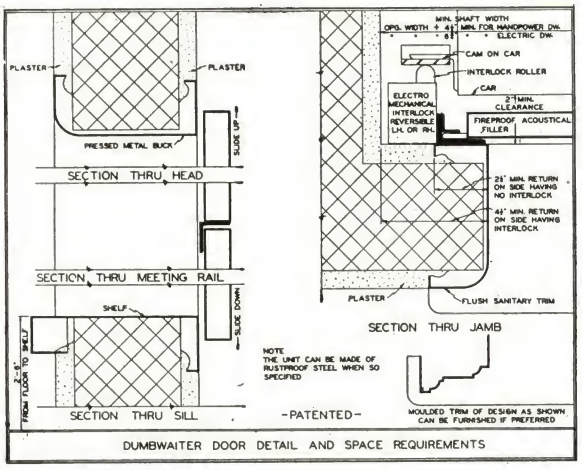
The Peelle Dumbwaiter Door unit is a counterbalanced door, mounted in steel guides with a combination pressed metal frame trim, and shelf. The entire unit is assembled in the factory, ready for setting into the masonry wall during construction.

Convenience

The door operates on the inside of the shaft, and takes up no floor space in opening or closing. It is adaptable to any plan arrangement. Each door has a 6-in. observation light so that the dumbwaiter is visible with the door closed.

Durability

The unit is built of steel throughout. There are no parts to wear out, or weights to drop off. A heavy flat link chain connects the two door sections. The sheaves are double duty ball bearing type.



Operation

The two halves of each door are perfectly balanced, and have malleable shoes to eliminate friction. This construction, in conjunction with the ball bearing sheaves, provides easy and swift opening and closing.

Safety

Each unit, for electric dumbwaiters, is provided with an electric interlock to prevent the operation of the dumbwaiter except when all doors in the shaft are closed. Each door is also equipped with an automatic lock that prevents the door being opened except when the dumbwaiter is at the landing.

Erection

The doors, frames, guides and hardware are assembled in the factory to make a complete working unit. No field erection is required. The unit is built into the masonry wall like a window frame.

Economy

The first cost is the last cost. This unit saves maintenance and upkeep, saves floor space, saves time in opening and closing, and saves field erection.

Appearance

The frame is of pressed metal, with a neat trim, mitered and welded at the corners. The unit as a whole is designed to present a pleasing architectural appearance.

Room Side View

SPECIFICATIONS

Dumbwaiter Doors

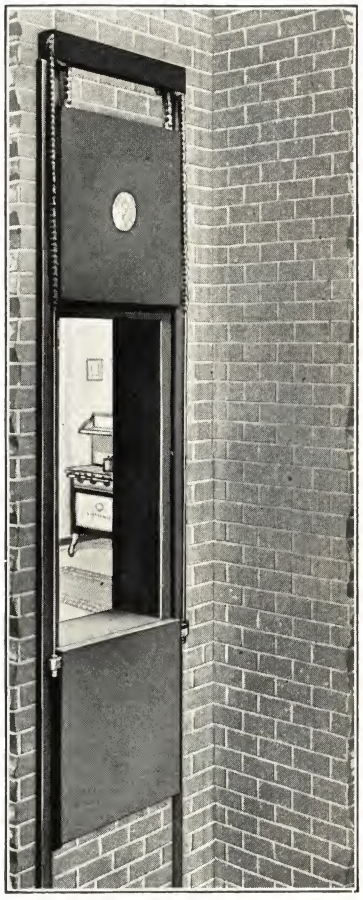
The openings to the dumbwaiter shall be provided with Peelle Standard Dumbwaiter Door Units as manufactured by THE PEELLE COMPANY, 47 Stewart Avenue, Brooklyn, N. Y.

The doors shall be of the counterbalanced type, with pressed steel panels, a 6-in. observation light and combination frame and trim to fit a 4, 5 or 6-in. wall with allowance for plaster on (one or both sides) all assembled with steel guides, sheaves and hardware ready for setting into the masonry wall. The material shall have a shop coat of paint before shipping. The Units shall be set plumb and in vertical alignment by the General Contractor.

The doors shall be guaranteed for two years against defects in workmanship and materials by the manufacturer.

Dumbwaiter Door Locks (For Electric Dumbwaiter)

Each of the Peelle Dumbwaiter Door Units shall be equipped with the Peelle combination interlock and automatic lock. The wiring of the interlock and installation of the cam for operating the automatic locks shall be done by the dumbwaiter manufacturer.

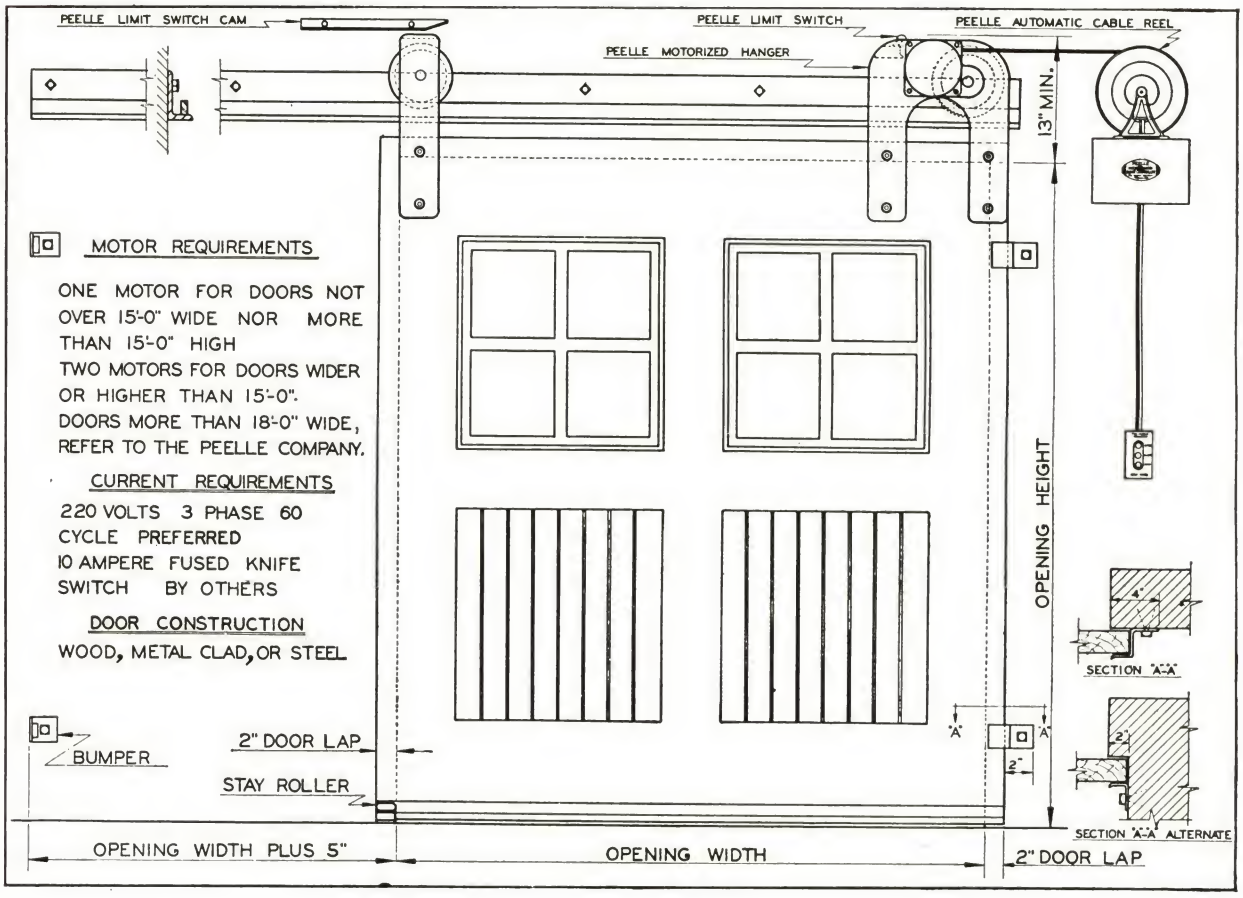


Shaft Side View

PEELLE INDUSTRIAL ENTRANCE DOORS

Motorized Door

SINGLE HORIZONTAL SLIDE



GENERAL DATA

Current

Where primary current supply is other than 208 to 230 volt 3 phase 60 cycle, refer to The Peele Company, giving size, number of openings, and characteristics of available current.

Door Construction

Wood construction is preferred due to its lightness and its ease of repair in case of damage.

Doors of special designs can be executed in wood, metal clad, steel, bronze, or aluminum. Doors can be built to meet special rust resisting and insulating requirements.

Control

Push button stations for each door may be located at one or more places as required.

Locks

Manual or automatic electro magnetic locks may be used.

For doors that may remain unlocked during the day, the manual lock is recommended. This door is unlocked manually, and remains unlocked until it is locked manually.

For doors that must be locked at all times when closed, the automatic electro-magnetic lock is recommended. The door is unlocked magnetically each time the "Open" push button is operated.

SPECIFICATIONS

Furnish, deliver and erect in complete working order, Peelle Single Horizontal Slide Motorized Doors where indicated on the drawings in accordance with the following specifications:

The doors shall be (constructed of 2½-in. thick white pine stiles and rails with ⅞-in. panels, and provision for glass as shown on the plans) (constructed of 2½-in. thick metal clad as shown on the drawings) (constructed of ⅛-in. steel plates and 2-in. steel angle frames as shown on the drawings) (constructed as shown on the drawings).

Each door shall be equipped with bumpers, stay rollers, and chafing strips. The doors shall be hung on double race, ball bearing, Motorized Hangers. The hangers shall have turned groove wheels running on steel angle and bar tracks.

The Motorized Hangers shall be wired with flexible wire cable connected to automatic cable reels.

The doors shall be controlled from momentary "Open," "Stop," and constant pressure "Close" buttons. Push button stations shall be located where indicated on the plans. Provision for emergency manual operation shall be made.

Suitable automatic reversing controllers, and limit switches shall be provided.

All of the material shall receive one shop coat of paint. Workmanship and material shall be guaranteed for a period of two years.

Work not included under this heading, but specified elsewhere: Glazing, Wiring, 208 volt, 3 phase 60 cycle primary power supply near each door, and field painting.

PEELLE INDUSTRIAL ENTRANCE DOORS

TELCO TYPE

Motorized

GENERAL DATA

Use

For use at exterior entrances to industrial and commercial buildings.

Door Construction

Wood construction is recommended on account of its light weight and low replacement cost in case of damage. These doors can be executed in wood, metal clad, steel, bronze, or aluminum. They can also be built to meet special rust resisting, insulating, and architectural requirements.

Control

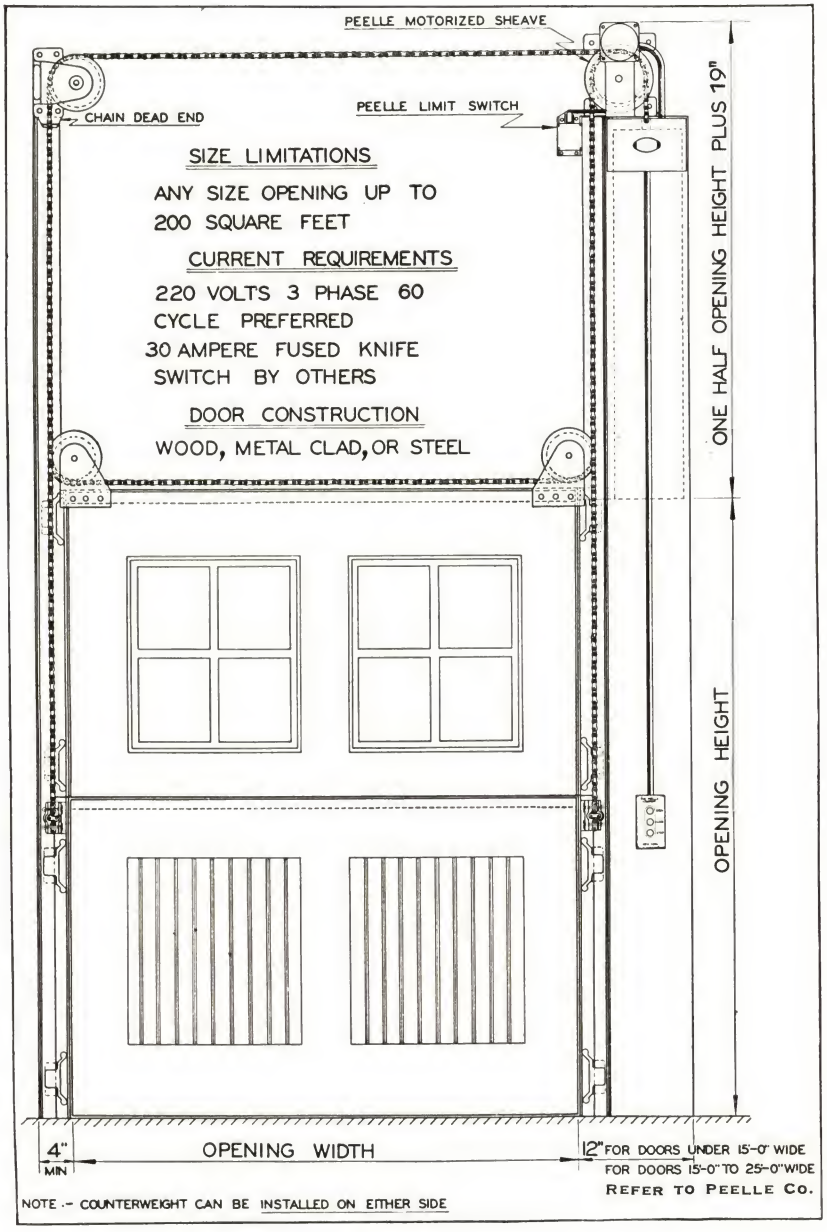
Push button stations may be placed at one or more points to provide remote control.

Locks

Manual or automatic (electro- magnetic) locks can be furnished.

For doors that may remain unlocked during the day, the manual lock is recommended. The manual lock operates like a dead lock, and remains unlocked until it is locked manually.

For doors that must be locked at all times when closed, the automatic (electromagnetic) lock is recommended. With this lock, the door is unlocked magnetically each time the "open" push button is operated, and locks the door automatically when fully closed.



SPECIFICATIONS

Furnish, deliver, and erect, in complete working order, Peelle Motorized Telco Doors where indicated on the drawings in accordance with the following specifications:

The doors shall be constructed of (2½-in. thick white pine stiles and rails, with ⅞ in. panels, and provision for glass as shown on the drawings) (constructed of 2½-in. thick metal clad as shown on the drawings) (constructed of ⅛-in. steel plates and 2-in. steel angle frames as shown on the drawings) (constructed as shown on the drawings).

The doors shall be two speed, vertical sliding, electrically operated. The doors shall be equipped with malleable iron, milled groove shoes, running in steel guides. The doors shall be connected to counterweights with flat link cable chain, running over double race ball bearing sheaves, mounted in malleable iron housings. The counterweights shall run in steel guides, completely enclosed with a removable sheet steel cover.

The motors shall be so arranged that the doors may be manually operated in case of power failure without disconnecting any of the mechanical or electrical parts.

The door shall be controlled from a push button station having a momentary "open" and "stop" button, and a constant pressure "close" button. Push button stations shall be located where indicated on the plans. Suitable automatic reversing controllers and limit switches shall be provided.

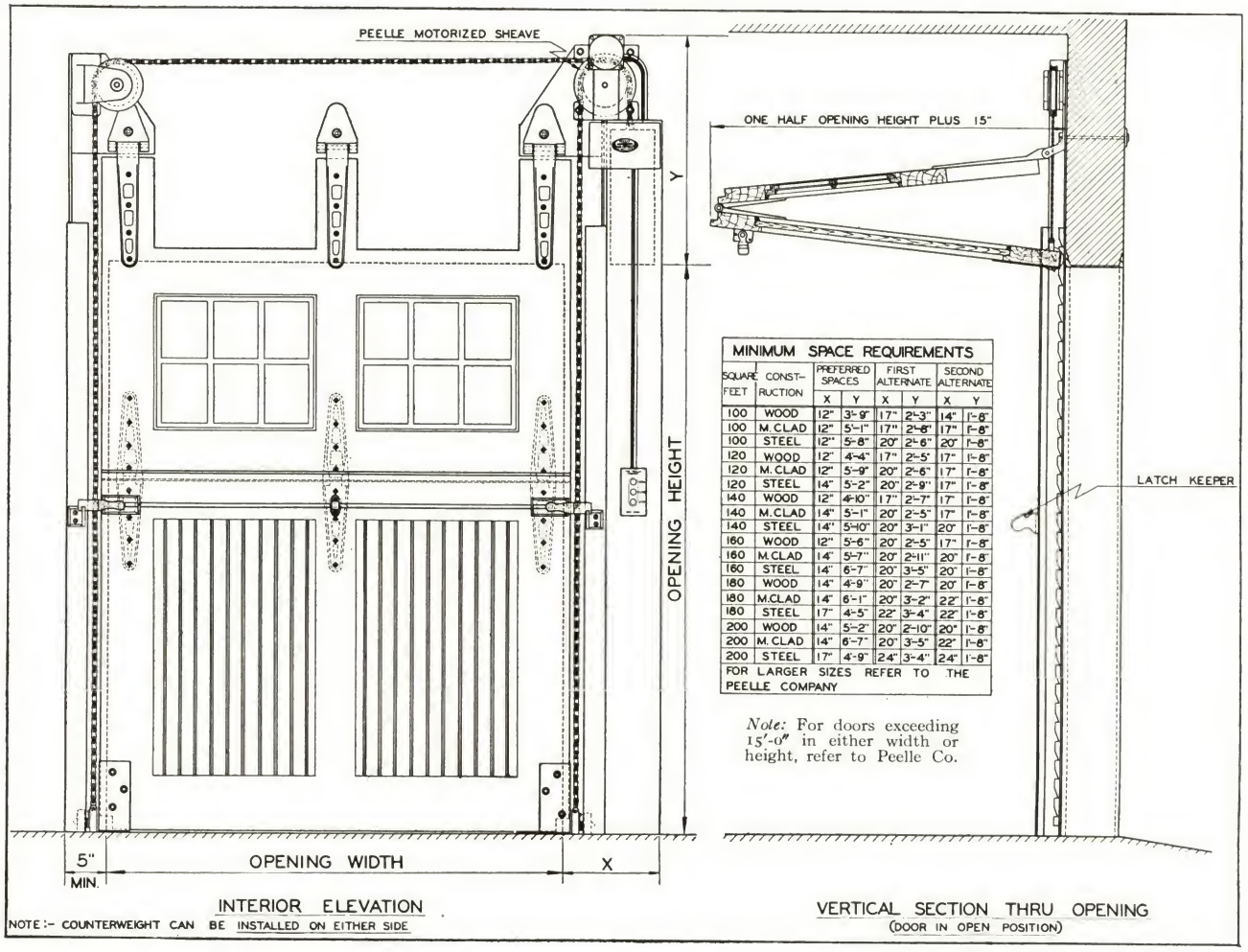
All of the material shall receive one shop coat of approved paint. Workmanship and material shall be guaranteed for a period of two years.

Work not included under this heading, but specified elsewhere: Glazing, primary power supply near each door, wiring, and finish painting on job.

PEELLE INDUSTRIAL ENTRANCE DOORS

ADJACENT CONTROLLED BIFOLD TYPE

Motorized Door



MINIMUM SPACE REQUIREMENTS

SQUARE FEET	CONSTRUCTION	PREFERRED SPACES X	PREFERRED SPACES Y	FIRST ALTERNATE X	FIRST ALTERNATE Y	SECOND ALTERNATE X	SECOND ALTERNATE Y
100	WOOD	12"	3'-9"	17"	2'-3"	14"	1'-8"
100	M. CLAD	12"	5'-1"	17"	2'-8"	17"	1'-8"
100	STEEL	12"	5'-8"	20"	2'-6"	20"	1'-8"
120	WOOD	12"	4'-4"	17"	2'-5"	17"	1'-8"
120	M. CLAD	12"	5'-9"	20"	2'-6"	17"	1'-8"
120	STEEL	14"	5'-2"	20"	2'-9"	17"	1'-8"
140	WOOD	12"	4'-10"	17"	2'-7"	17"	1'-8"
140	M. CLAD	14"	5'-1"	20"	2'-5"	17"	1'-8"
140	STEEL	14"	5'-10"	20"	3'-1"	20"	1'-8"
160	WOOD	12"	5'-6"	20"	2'-5"	17"	1'-8"
160	M. CLAD	14"	5'-7"	20"	2'-11"	20"	1'-8"
160	STEEL	14"	6'-7"	20"	3'-5"	20"	1'-8"
180	WOOD	14"	4'-9"	20"	2'-7"	20"	1'-8"
180	M. CLAD	14"	6'-1"	20"	3'-2"	22"	1'-8"
180	STEEL	17"	4'-5"	22"	3'-4"	22"	1'-8"
200	WOOD	14"	5'-2"	20"	2'-10"	20"	1'-8"
200	M. CLAD	14"	6'-7"	20"	3'-5"	22"	1'-8"
200	STEEL	17"	4'-9"	24"	3'-4"	24"	1'-8"
FOR LARGER SIZES REFER TO THE PEELLE COMPANY							

Note: For doors exceeding 15'-0" in either width or height, refer to Peelle Co.

GENERAL DATA

Use

For use at exterior entrances to industrial and commercial buildings.

Current

Where primary current supply is other than 208 to 230 volt 3 phase 60 cycles, refer to The Peelle Company, giving size, number of openings, and characteristics of available current.

Door Construction

Wood construction is recommended on account of its light weight and low replacement cost in case of damage. These doors can be executed in wood, metal clad, steel, bronze, or aluminum. They can also be built to meet special rust resisting, insulating, and architectural requirements.

Control

Push button stations must be placed on weight box.

Locks

Manual lock is furnished which operates like a dead lock and must be unlocked manually.

SPECIFICATIONS

Furnish, deliver, and erect in complete working order, Peelle Adjacent Controlled Bifold Motorized Doors where indicated on the drawings, in accordance with the following specifications:

The doors shall be (constructed of 2½-in. thick white pine stiles and rails, with ⅞-in. panels, and provision for glass as shown on the drawings) (constructed of 2½-in. thick metal clad as shown on the drawings) (constructed of ⅛-in. steel plates and 2-in. steel angle frames as shown on the drawings) (constructed as shown on drawings).

The doors shall be horizontal folding, electrically operated. The doors shall be equipped with malleable iron, ball bearing rollers, running in steel guides. The doors shall be connected to counterweights with flat link cable chain, running over double race ball bearing sheaves mounted in malleable iron housings. The counterweight shall run in steel guides, completely enclosed with a removable sheet steel cover.

The motors shall be so arranged that the doors may be manually operated in case of power failure without disconnecting any of the mechanical or electrical parts.

The door shall be controlled from a push button station having a constant pressure "open" and "close" button. Suitable automatic reversing controllers shall be provided.

All of the material shall receive one shop coat of approved paint. Workmanship and material shall be guaranteed for a period of two years.

Work not included under this heading, but specified elsewhere: Glazing, primary power supply near each door with 30-amp. fused knife switch, wiring, and finish painting on job.

CERTIFIED PERFORMANCE OF PEELLE DOORS

The A. C. Nielsen Company, neutral engineers, have compiled many surveys of Peelle Door Performances and costs. These surveys have been made for a wide variety of installations. A few excerpts are given below. Copies of complete surveys will be gladly sent upon request to THE PEELLE COMPANY.

Excerpts from Survey made by A. C. Nielsen Company.

"The superiority of PEELLE *Doors under hard service has been sufficiently demonstrated to warrant repeat orders."*

✦

"The management of the plant considers the safety features of PEELLE *Doors a vital necessity to safe operation."*

Excerpts from Survey made by A. C. Nielsen Company.

*"*PEELLE *Doors have reduced repair costs and delivery delays, and have practically eliminated the chance for accident always present before. Maintenance cost has been negligible!"*

✦

"Detailed cost data clearly indicates the substantial savings PEELLE *equipment is effecting."*

Excerpts from Survey made by A. C. Nielsen Company.

*"*PEELLE *Doors show an average annual saving of* $36.04 *per door or* $396.44 *for* 11 PEELLE *Units."*

✦

"No maintenance or repair costs have been incurred on PEELLE *Doors since installation. Alignment is perfect and all operate quietly."*

Excerpts from Survey made by A. C. Nielsen Company.

*"*PEELLE *equipment in this building saved* $17.66 *per year per door—a reduction of* 36%."

✦

"Nineteen PEELLE *Doors cost only* $20 *in* 4 *to* 5 *years of service."*

✦

"Returning 22½% *on added first cost."*

Excerpts from Survey made by A. C. Nielsen Company.

"Thirty PEELLE *Doors installed since* 1922 *following experience with other makes."*

✦

"The selection of PEELLE *Doors was the result of an investigation of their operating record at another installation."*

Excerpts from Survey made by A. C. Nielsen Company.

"Total saving on 34 PEELLE *Doors is* $600.44. *The additional cost of* PEELLE *equipment is being returned at the rate of* 18.5% *a year by saving on repair costs alone. This does not include saving of elevator time which is of greatest importance."*

PEELLE FREIGHT ELEVATOR DUMBWAITER INDUSTRIAL ENTRANCE DOORS

THE PEELLE COMPANY
BROOKLYN, N.Y.

RICHARDS-WILCOX MANUFACTURING CO.

INCORPORATED

Fire Doors and Hardware

AURORA, ILL.

BRANCHES IN ALL PRINCIPAL CITIES

For Other R-W Products, see Manufacturers' Index

CABLE ADDRESS
"Richwilco, Aurora"

CANADIAN FACTORY
LONDON, ONTARIO

R-W Fire Door Hardware and Fire Doors

The R-W line of Fire Door Hardware is one of the most complete and extensive manufactured and is doubly certain of being perfect because inspected and labeled by the Underwriters' Laboratories, Inc.

Fire Insurance Companies offer a premium for the installation of R-W Automatic Fire Doors.

The complete line is not shown in this catalogue but the following is a list of types. Complete details and prices on application.

Two Link, Flat and Round Track, Fixtures for Single Sliding Doors with Incline Track
Single Link, Flat and Round Track Fixtures for Single Sliding Doors with Incline Track
Single Link Flat and Round Track Fixtures for Sliding Doors in Pairs, with Incline Track
Single Link Flat and Round Track Fixtures for Single Sliding Doors with Level Track
Single Link Flat Track Fixtures for Single Sliding Doors with Drop Bracket Level Track
Single Link Flat Track Fixtures for Pairs of Sliding Doors with Level Track
Single Link Flat Track for Pairs of Sliding Doors, with Level Track, Drop Bracket Type

Views of R-W No. 97 Fusible Link from Unretouched Photo

Shows sides of finished link and edge of semi-finished link (also, both sides of half-link phosphor-bronze blanks, before any soldering has been done on them)

Horizontal Turnover Fire Door Hardware
Two Section Vertical Fire Door Fixtures
Two Link Flat and Round Track Vertical Fire Door Fixtures for Single Vertical Doors
Fixtures for Single Swinging Fire Doors
Fixtures for Swinging Doors in Pairs
Fire Shutter Fixtures
Fixtures for Single Trap Doors
R-W Tin-Clad and Corrugated Sheet Metal Fire Doors
Angle Iron Door Frames for Face of the Wall
Angle Iron Door Frame, Rabbetted Type
Channel Frames
R-W Angle Iron Sills

Automatic Fire Door Equipment, Made Sensitive for Fires and Strong for Daily Service

It is vitally important that the fusible links of fire door equipment be so painstakingly fabricated and constructed that there is not the slightest element of imperfection in them. They must be so perfect that they will function instantly, in spite of having been subjected for years after installation to the deteriorating effect of natural influences; in spite of the fact that they may have become coated with grime, dust and other deleterious matter, as well as being subjected to heat, cold, dryness, dampness and other conditions inclined to reduce their sensitiveness to fire.

With these considerations vividly in mind, the Richards-Wilcox fusible link was developed, and its effective action in stopping many fires, saving millions of dollars in property values (in some cases years having passed since installation) gives irrefutable evidence of its perfection.

R-W No. 447 "FyeR-Wall" Sheet Metal Doors

Inspected by the Underwriters' Laboratories, Inc., under direction of the National Board of Fire Underwriters. Doors bear the Underwriters' label.

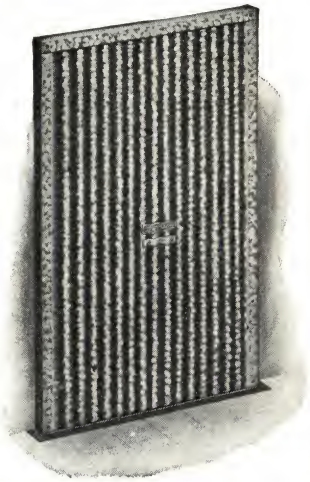
The vertical outside frame members of the door consist of a heavy angle and a light angle. The edge of the corrugated sheet on the exposed side of the door is flattened out and bent around the heavy angle of the frame which presents a neat finished appearance without exposed raw edges of steel. The light angle covers the end of the horizontal corrugated sheets on the wall side of the door. The top and bottom horizontal frame members are heavy bars of steel which are completely covered with galvanized sheet metal.

Allowances are made in the construction of the door so that when exposed to heat, all parts can expand freely without distorting the shape of the door. Therefore, in case of fire, the door will retain its normal position close to the wall, successfully preventing the passage of flames.

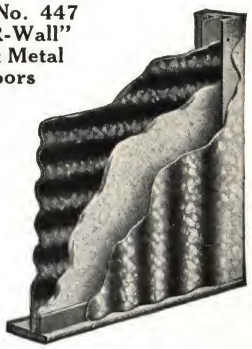
Built in either square top or incline top and can be mounted with sliding door hardware or with lap or flush types of swinging door hardware or vertical door hardware.

The construction of the door is exceptionally rigid so that it will maintain its shape under all conditions. The door is especially good in places where subjected to rough usage and where tin-clad doors would easily be damaged.

Thickness of door 2⅝-in.; weight about 5 lb. per sq. ft.



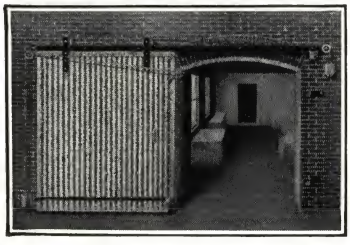
R-W No. 447 "FyeR-Wall" Sheet Metal Doors



R-W Monarch Two Link Flat Track Fire Door Fixtures

We recommend these fixtures where headroom exceeds 3 ft.

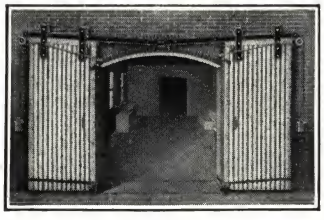
This arrangement of automatic device provides two fusible links—one constantly in opening and exposed from both sides and one link near ceiling. If either link fuses, door is released and closes by gravity



R-W Single Link Flat Track Fire Door Fixtures

This fixture is used for openings where there is not enough headroom to place track on an incline of ¾ in. to the foot. Two sets of weights are used to balance the door. The back weights are held in position by a fusible link. In case of fire, this link fuses and allows back weights to drop, and the front weights then pull the door shut.

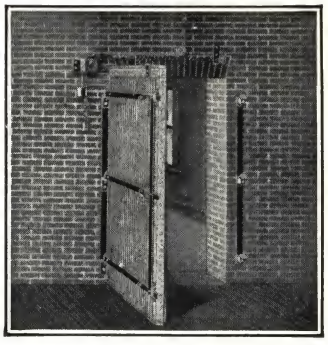
Same style as No. 201 except that it operates on level track. Has one fusible link which is exposed in the opening



R-W Single Link Flat Track Fire Door Fixtures

This fixture is the same as No. 201 except that it is applied to pairs of doors. Designed to meet special conditions, such as not sufficient space on one side to slide a large door, or if an overhead carrier system track passes through the opening.

This type has one fusible link on each door, and both are exposed in the opening



R-W Automatic Fire Door Fixtures

The automatic link and cord arrangement on this fixture extends above the opening of ceiling, and when used with doors on both sides of wall same extends through, so that the fusing of link on either side will cause the doors to close. No. 643 Door Closer and Check may be substituted for weight closing device if desired. Fixtures furnished for either flush or lap doors

ESTABLISHED 1891

THE RICHMOND FIREPROOF DOOR CO.

RICHMOND, IND.

Branch Offices and Agents with Sales, Erection and Service Facilities in 70 Principal Cities Throughout the United States, including

ATLANTA, GA.	COLUMBUS, OHIO	HARRISBURG, PA.	MINNEAPOLIS, MINN.	PITTSBURGH, PA.
BALTIMORE, MD.	DALLAS, TEX.	HOUSTON, TEX.	NASHVILLE, TENN.	RICHMOND, VA.
BOSTON, MASS.	DAVENPORT, IOWA	INDIANAPOLIS, IND.	NEWARK, N. J.	ST. LOUIS, MO.
BUFFALO, N. Y.	DENVER, COLO.	KANSAS CITY, MO.	NEW ORLEANS, LA.	SALT LAKE CITY, UTAH
CHICAGO, ILL.	DETROIT, MICH.	LOS ANGELES, CAL.	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
CINCINNATI, OHIO	GRAND RAPIDS, MICH.	LOUISVILLE, KY.	OMAHA, NEB.	SEATTLE, WASH.
CLEVELAND, OHIO	GREENSBORO, N. C.	MILWAUKEE, WIS.	PHILADELPHIA, PA.	SYRACUSE, N. Y.
TAMPA, FLA.	TOLEDO, OHIO	WASHINGTON, D. C.	WICHITA, KAN.	

Products

KALAMEIN DOORS, FRAME and TRIM.

KALAMEIN ENTRANCE UNITS (Aluminum, Copper or Bronze).

TINCLAD DOORS and HARDWARE.

CORRUGATED STEEL DOORS and HARDWARE.

COUNTERBALANCED ELEVATOR DOORS.

VERTICAL TELESCOPING ELEVATOR DOORS.

INDUSTRIAL DOORS (all types) and HARDWARE.

DUMBWAITER DOORS.

STEEL PLATE STORAGE ROOM DOORS.

STRUCTURAL SECTION DOOR FRAMES.

FORMED and ROLLED STEEL FRAMES.

(Underwriters' label service where requested.)

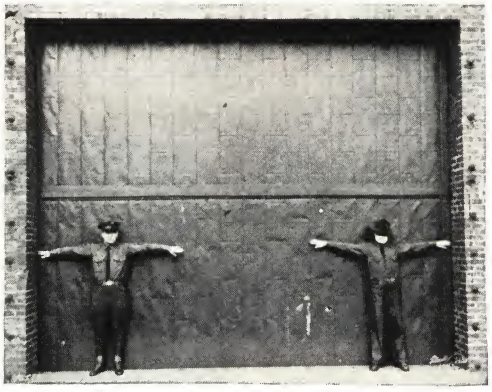
Plant and Facilities

Richmond "Fyrgard" products are used in America's foremost structures. They have fully met the needs of architects, contractors and owners, for design, superservice, permanence and beauty for over forty years.

Strictly modern manufacturing facilities—an organization of "door-minded" men long experienced in design and production guarantees our permanently maintaining the present high standard of quality, uppermost promptness of deliveries and the early anticipation of future architectural requirements.

Special Conditions and Problems—We have a thoroughly competent and experienced Engineering Department which is always at the service of those who meet with unusual and difficult problems in our line.

Obtain complete catalogues from the nearest field office or from the Home Office.



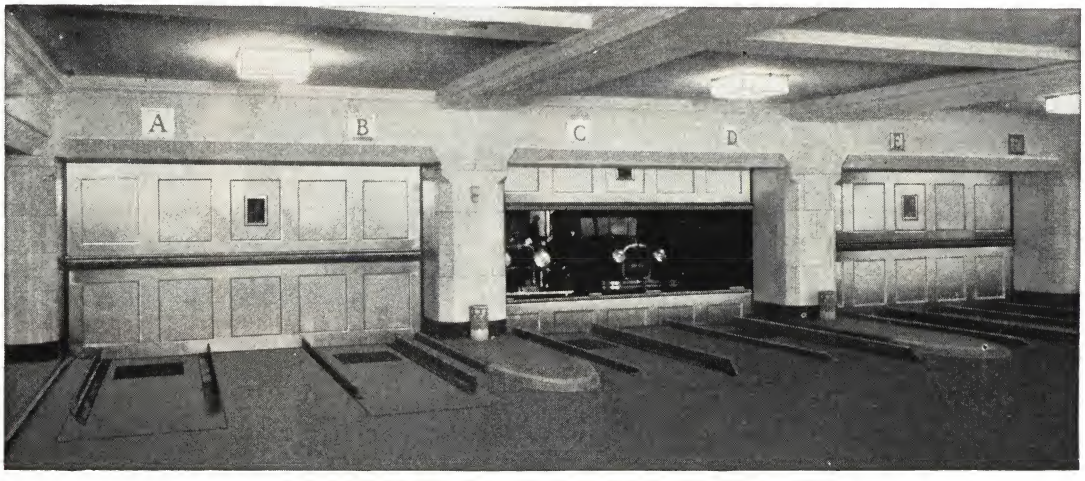
From an Unretouched Photo Taken Spring 1931—Indiana State Armory, Indianapolis, Ind.

Door is 16 ft. wide by 13 ft. 6 ins. high. Trucking sill reinforced to carry army trucks, armored cars and tractors. Note lack of sag. Erected in 1925

Counterbalanced Elevator Doors

Richmond counterbalanced doors were selected for the National Parking Garages at Chicago, primarily because of their rugged construction and the substantial trucking sills which are so well adapted to wide openings shown below.

Two hundred eighty-three of these large doors were furnished, each door approximately 14 ft. 6 ins. wide by 8 ft. high. Each section weighed approximately 900 lbs. Despite their massive construction, the balance is per-



Typical First Floor View in a National Parking Garage

Richmond Doors illustrated have bronze covered panels

fect, a result of proficient workmanship in manufacture and installation. These doors quietly operate to extreme points in less than four seconds:

Doors on the ground floor are finished with bronze kalamein panels, thus retaining their inherent serviceableness, yet blending perfectly with the architectural scheme.

Counterbalanced elevator doors are now universally preferred for freight elevator shafts because they are installed entirely on the inside of the shaft and do not encroach either on floor space or car platform. They provide maximum clear opening.

The door is divided into two equal sections, one half sliding up and the other half sliding down. The guides are bolted to the wall or opening frame.

Vertical telescoping doors are similar in design except that both halves slide upwards, the lower section traveling twice as fast as the upper.

For these types regular installation requires a distance from floor to floor of one and one-half times the opening height, plus 9 ins. for counterbalanced, and 24 ins. for vertical telescoping doors, respectively. For limited floor heights the counterbalanced door may be furnished in pass type construction.

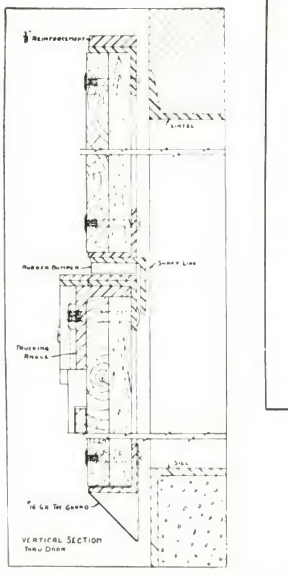
Corrugated iron vertical telescoping and counterbalanced doors of the tinclad, kalamein or corrugated iron construction may be labeled by the Underwriters. Operation may be manual (with Richmond interlocks) or electrical.

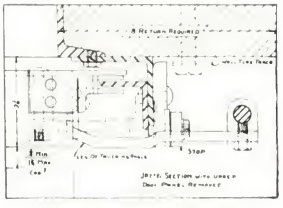
Both types require approximately 8 ins. side room each side, but the telescoping door, being counterweighted, needs in addition space at both sides for 8x8-in. weight box.

Richmond counterbalanced doors are furnished with heavy double race ball bearing sheaves, vision panels of labeled construction, if specified, and all modern improvements.

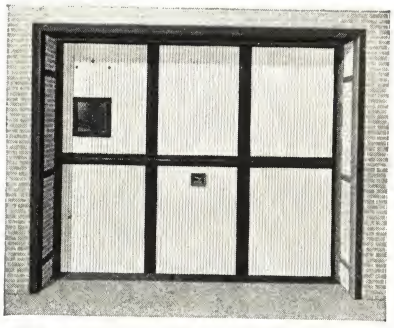
The upper rail of the lower section of the door is so reinforced and constructed that when the door is open a "bridge" is formed between the car and the building sill and the span is supported at each end by substantial parts of the door assembly. This "bridge" provides a smooth trucking surface over the door.

Our catalogue gives all details of construction including shaft space requirements. Let us place a copy in your files.

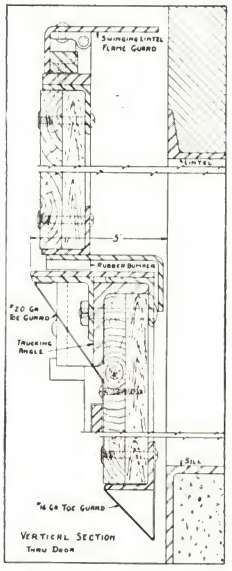


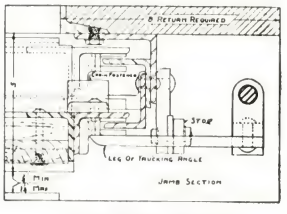


Regular Type Section

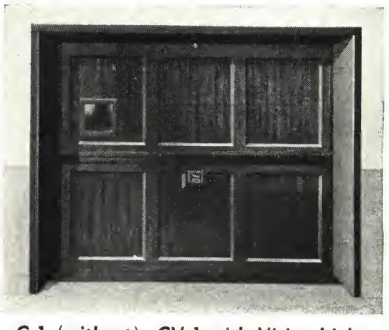


C-4 (without), CV-4 with Vision Light
Corrugated steel panels

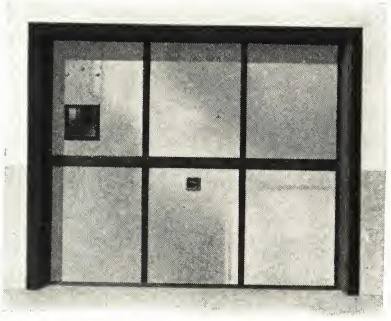




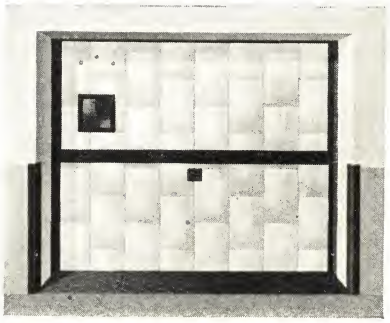
Pass Type Section



C-1 (without), CV-1 with Vision Light
Kalamein paneled



C-2 (without), CV-2 with Vision Light
Flush panel kalamein



C-3 (without), CV-3 with Vision Light
Panels covered with terne plate

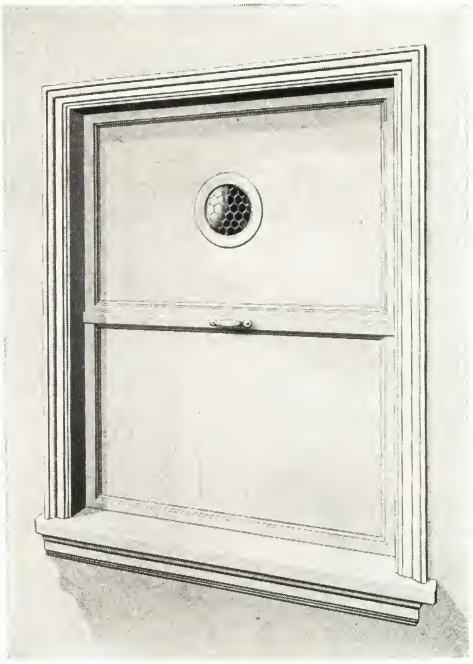
Standard Types of Counterbalanced Elevator Doors

Richmond Aluminum Counterbalanced Dumbwaiter Door

TRADE Fyrgard MARK
RICHMOND FIREPROOF DOOR CO.
RICHMOND, IND.

Here is a door in keeping with the modern trend of building. It is inexpensive, has clean, sharp lines, is neat in appearance, quiet in operation, and very light in weight.

This door is ideal for openings in hospital kitchens,



or any room that is subject to dampness, for it will not corrode and does not require painting.

An aluminum unit as shown for an opening 3 ft. in width by 4 ft. in height, including steel struts and aluminum rolled frame and trim will weigh approximately 130 lbs. as compared with 190 lbs. for a steel door of similar size.

Many different types of aluminum wall frames are available with this door.

These doors with struts from floor to ceiling can be set by the contractor and left standing until the tile setters build the wall.

It is recommended that the door, frame, shelf and struts be bought as a unit for immediate installation.

All necessary bolt and anchors are furnished by Richmond.

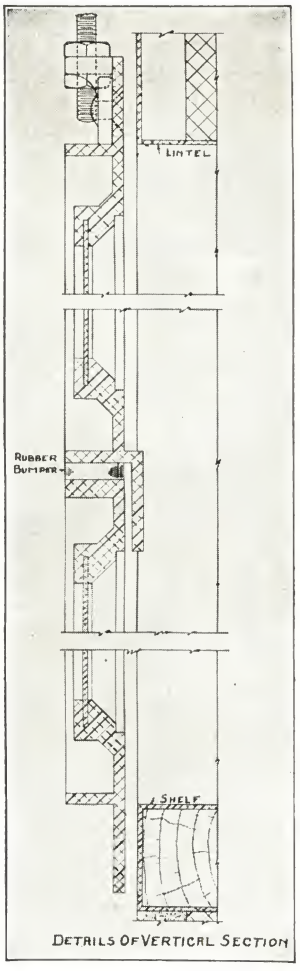
Richmond Aluminum Counterbalanced Dumbwaiter Doors are permanently adjusted at the factory.

Sprocket chains and ball bearing sprockets assure easy, uniform operation.

All door panel frames and track are exclusive extruded aluminum shapes.

Note: Richmond also manufactures kalamein, terne plate and steel plate dumbwaiter doors.

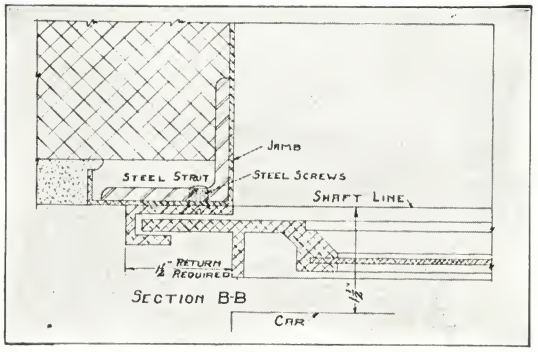
Ask for our catalogue for additional details and specifications.



DETAILS OF VERTICAL SECTION

Electro mechanical interlocks can be furnished when desired. Richmond interlocks prevent car from moving when any door in shaft is open.

Richmond will furnish, when specified, removable panels for access to dumbwaiter machinery. Units are also made so the car can be taken out of shaft for each access in making repairs.



Note the Simple Track Construction and Assembly Details

Kalamein Doors, Frames and Trim

TRADE Fyrgard MARK
RICHMOND FIREPROOF DOOR CO.
RICHMOND, IND.

Doors, frames, or trim may be furnished in any design illustrated, and to any dimension. Doors of design other than shown can be supplied upon request, and the same holds true in regard to frames and trim. All types illustrated are of standard construction and thickness.

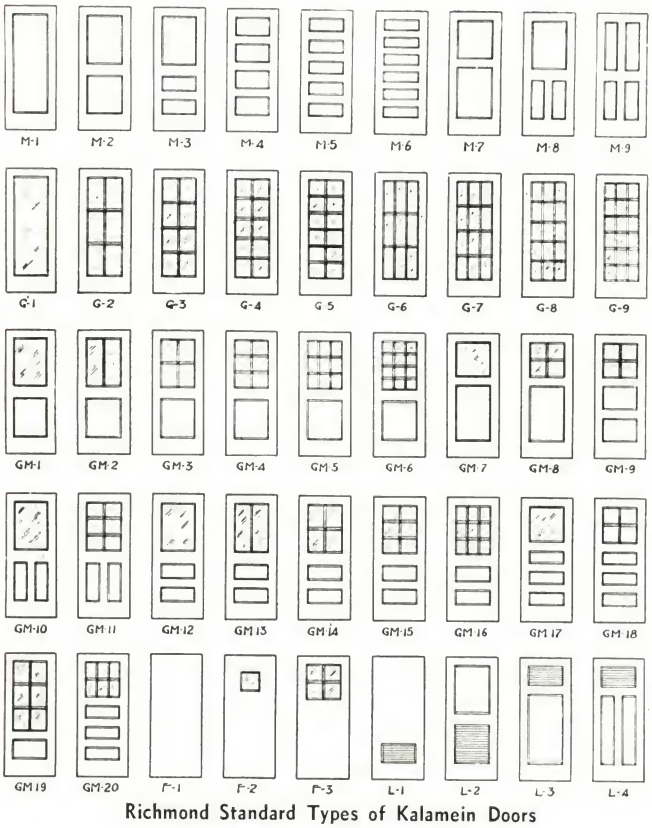
Those other than standard may be had upon request, with additional charge for special work involved in their fabrication.

Kalamein swing doors may be furnished with or without Underwriters' label. The cores are constructed of the best solid white pine or spruce covered with 24-gauge patent leveled copper bearing steel. This rust-resisting metal, coated to Richmond specifications, will not flake in forming.

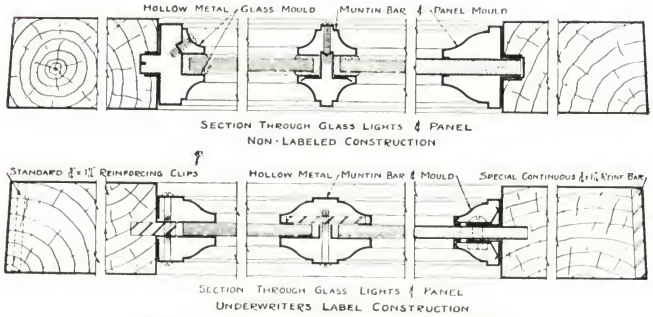
The hollow metal panel moulding is attached to the doors by concealed clips and greatly improves the appearance of the door, as unsightly nailheads required for fastening panel moulding of Kalamein construction are eliminated.

Kalamein frames are likewise covered with 24-gauge metal. Their surface is smooth, waveless, and without blemish. Metal covered plinth blocks of any design can be furnished when necessary.

Kalamein frames are of non-labeled construction. If labeled frames are required, refer to our all-metal frame details.



Richmond Standard Types of Kalamein Doors



Richmond Standard Construction Details

Kalamein Smoke Screen (Partition) Unit
Furnished in all Kalamein or with rolled steel skeleton

We have dies for an unusually large variety of casings and mouldings. Kalamein frames and trim, or combination pressed steel bucks, can be provided with doors.

Our catalogue contains illustrations of paneling types, moulding shapes, standard specifications, details of construction and other valuable information.

Richmond kalamein frames are formed upon cores rabetted from one solid piece of wood, and casings, mouldings, etc., are of solid wood lengths up to standard sizes. No piecing or patching is permitted.

For elevator enclosures, our doors are specially reinforced at the head to receive hardware when appropriate.

Durable baked enamel, plain color or wood grained, is applied in our own ovens, when desired.

The Richmond Fireproof Door Co. is prepared to furnish, when desired, special Underwriters' labeled finished hardware completely installed in doors.

Write for Richmond details of their 20-gauge aluminum kalamein doors (any design), frames, trim, or entrance units.

Many architects are specifying aluminum due to its beauty, rustproof qualities and modernistic appearance. Economically priced.

Note: In so far as possible, Richmond Kalamein Door Standards are made to conform to the Simplified Practice Recommendation R83-28, issued by the Department of Commerce, Bureau of Standards, effective April 1, 1928.

Metal Frames, Formed and Rolled

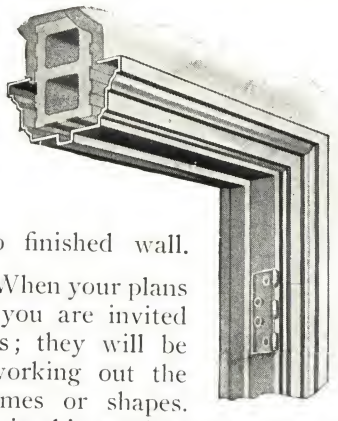
Richmond metal frames are distinguished by a new beauty and sharpness of line, made possible through the use of our specially designed machinery.

The standard types shown on this page provide integral buck and trim for all interior door openings. Combinations of Types B and C frames are readily utilized for sliding elevator door openings.

Richmond Construction Features—At all hinge and striker plate locations steel reinforcements are spot-welded to the inner surfaces of the jambs. Holes are accurately drilled and tapped with templates through these reinforcing plates at the factory, providing for the rapid attachment of the hardware.

Plaster guards of 24-gauge galvanized steel are welded inside of the reinforcing plates to protect the screwholes from mortar and plaster. This saves time in the attachment of the hardware.

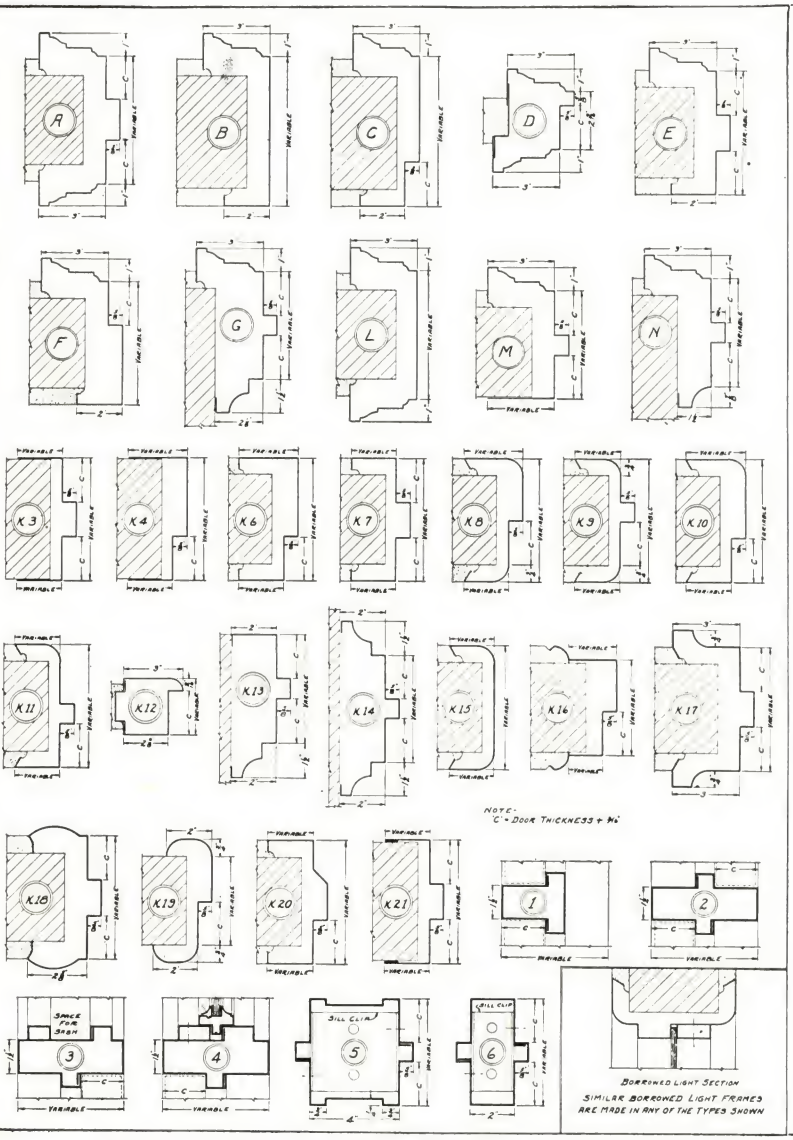
Adjustable anchors, made of 16-gauge stock, are furnished with Richmond steel frames. These anchors can be set wherever desired between courses of a masonry wall as the wall is built. The anchors require no adaptation of plan, yet bond frames solidly to finished wall.



Richmond Service—When your plans call for special frames you are invited to consult our engineers; they will be glad to co-operate in working out the designs for special frames or shapes. Our years of experience in this special field will be of value to you.

With our very latest type of rolling and forming machinery we can easily handle large contracts very efficiently.

Call in our nearest representative or write the home office for additional data and specifications.



RICHMOND STANDARD TYPES OF METAL FRAMES, TRANSOM BARS, MUNTIN BARS AND BORROWED LIGHTS

Standard Equipment

Adjustable anchors
Plaster guards
Hardware reinforcements
Drilling and tapping
Sill clips
Spreaders (when specified)

Richmond Construction

"K" type frames are formed and can be furnished in 12, 14 or 16-gauge steel. All other types shown are rolled and can be furnished only in 16-gauge.

Underwriters' Limitations

16-Gauge—
3 ft. 6 in. x 7 ft. 6 in. (single doors)
5 ft. 0 in. x 7 ft. 6 in. (door pairs)

14-Gauge or Over—
4 ft. x 10 ft. (single doors)
8 ft. x 10 ft. (door pairs)

Frames—Frames having transom bars cannot be labeled.

Painting

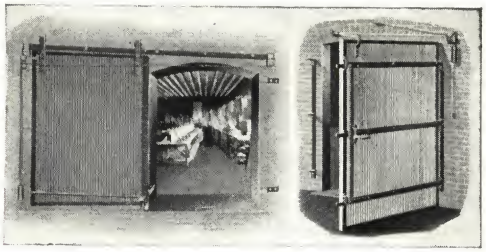
All concealed and exposed surfaces are given a good prime coat of rust-resisting gray paint at factory prior to shipment.

Miscellaneous Products

These illustrations will give you an idea of Richmond's many products.

From our spacious plant ten carloads of fire-retardant doors were shipped to Chicago for the Merchandise Mart on scheduled time without interruption of other orders then in process.

Write for our complete catalogue file.

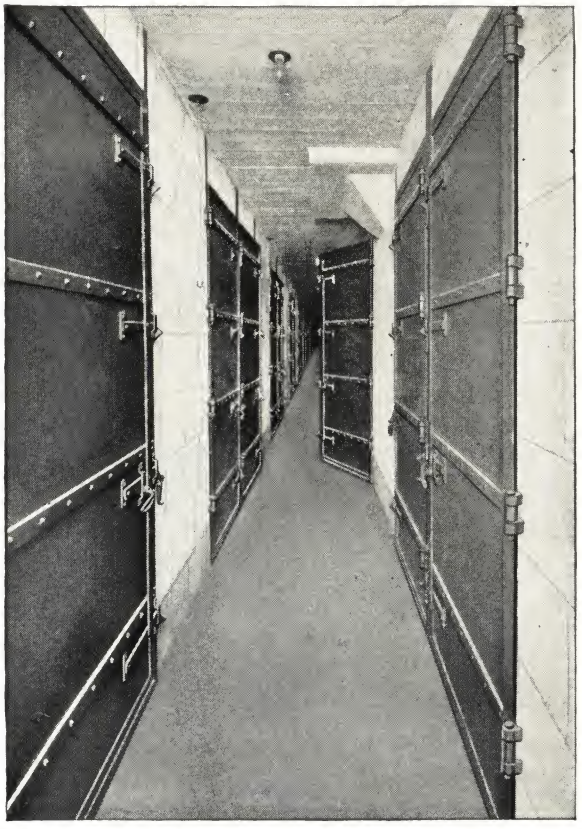


Typical Richmond Fire Resisting Doors

Corrugated steel shown. Tinclad may be substituted. We make our own hardware

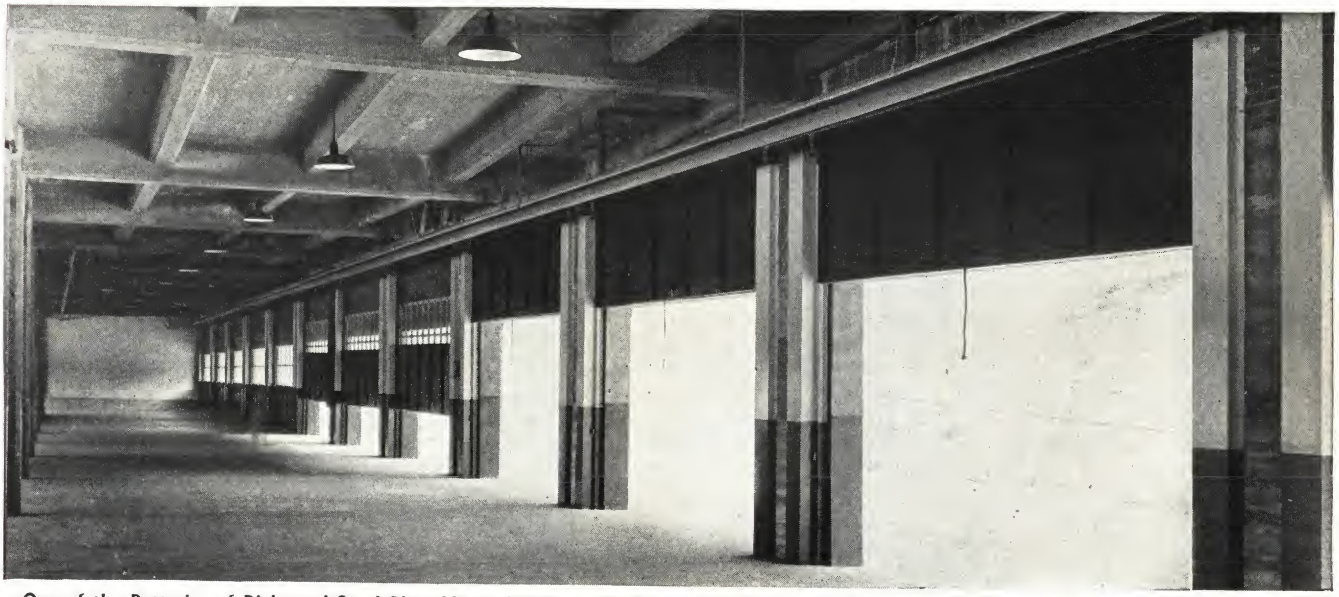
Sturdy Bifolding Doors (2½ Inches Thick) with Richmond Hardware

Panels can be of wood, metal clad or steel



Richmond Labeled 14-gauge Steel Plate Doors for Storage Warehouses

Note the length of our heavy strap hinges which act as additional panel reinforcements



One of the Batteries of Richmond Steel Plate Vertical Telescoping Doors Furnished for the Pennsylvania Terminal Warehouse at Baltimore, Md.

These doors and hardware were specially built for heavy duty

SECURITY FIRE DOOR CO.

Counterbalanced Truckable and Other Fireproof Freight Elevator Doors

3036-3048 Lambdin Avenue, ST. LOUIS, MO.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Products

"Seco" Metal Clad, Corrugated, Kalamein and Steel Plate Counterbalanced Freight Elevator Door.

"Sec-Tel" Metal Clad, Corrugated, and Kalamein Two-section Slide-up Freight Elevator Door.

"Horifold" Warehouse, Freight House Shipping Platform and Garage Door.

"Vertel" Corrugated Warehouse, Freight House and Shipping Platform Two-section Slide-up Door.

"Uni-Motor" Electric Operators for Freight Elevator Doors and Car Gates.

"Seco" Electric Interlocks.

For our page on Dumbwaiter Doors, see Manufacturers' Index.

Underwriters' Approval

All "Seco" and "Sec-Tel" freight elevator doors are inspected and labeled by the Underwriters' Laboratories, Inc., and the Factory Mutuals, when so desired, provided they are within the size limits that permit labeling: viz., 8x10 ft.

The services of our Engineering Department, as well as those of our representatives in all the leading cities of the United States are at your disposal in solving door problems.

Write for Catalogue "D-2" covering our "Seco," "Sec-Tel" and Dumbwaiter Doors, or for Catalogue "C," giving complete information about our "Horifold" and "Vertel" Doors.

"Seco" Counterbalanced Freight Elevator Doors

"Seco" doors are of the *truckable* counterbalanced type, being made in two sections, which slide in opposite directions on the shaft face of the wall. The sections are of equal weight, evenly counterbalancing each other, eliminating all counterweights.

"Seco" doors can be furnished with metal clad, kalamein, corrugated steel or steel plate panels.

"Seco" doors are provided with heavy steel *angle trucking bars*. The *trucking bars* form the top edge of the lower section and are supported in *perfect alignment* with the opening or floor sill when the door is in the open position by means of heavy *angle trucking bar supports* at each end of the trucking bar.

These sill or trucking bar supports rest on the solid opening sill and when once set, remain in the same permanent position. The supports are designed to act as gusset plates in the upper corners of the lower section, reinforcing it and securely joining the section frame to the trucking bar.

"Seco" doors are hung with heavy adjustable chain rods and cable chain operating over large double race ball bearing sheaves. No safety gates required when "Seco" doors are used.

Metal Clad Panels—These doors are constructed of two thicknesses of cypress, and covered on both sides with flat galvanized steel sheets, and securely bolted into heavy angle frames.

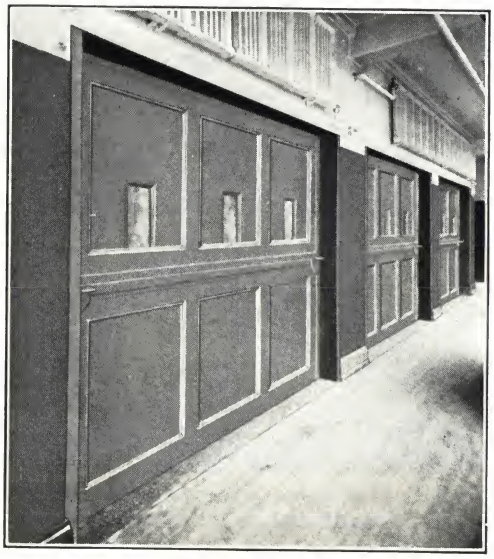
Kalamein Panels—These doors are constructed of cypress cores, paneled on the room side, flush on the shaft side. Room side of panels is covered with smooth kalamein iron, glued to the core, and has drawn steel mouldings around panels fastened in place so that no nail or screw heads show.

The shaft side of doors is covered with flat galvanized steel sheets. All seams between stiles and rails are clipped, filled with solder and ground smooth.

Corrugated Steel Panels—These doors are made of corrugated steel sheets riveted into angle frames forming door sections, and are stiffened vertically with flat steel reinforcing bars.

Adjustable Shoes (Patented)—"Seco" doors are equipped with patented adjustable shoes. These eliminate friction and permit adjustment to reduce side play between the doors and guides caused by wear and spreading of guides.

Room Side of Type M-6 "Seco" Door
Arranged for room side operation in connection with double button elevator



Kalamein "Seco" Door Installation

"Seco" Door Interlocks (Patented)

"Seco" doors when equipped with Security patented electric interlocks provide maximum protection against fire and accident.

Security electric interlocks are especially designed for vertically sliding doors and have been approved by the Underwriters and various State and municipal departments, assuring low casualty insurance rates.

Specify Type "C" or Type "D" interlocks for car switch controlled elevators, Type "DL" interlocks for push button or double button operated elevators.

Send for a copy of Catalogue "D2."

"Seco Uni-Motor" Electric Operators

A single unit applies power positively and equally at both sides of the door, making canting impossible. A motor of ample size is assembled compactly with its gears.

Should the door meet an obstruction while opening or closing, the motor will stall without injury to the apparatus. It is guaranteed to withstand stalling, at full voltage, for ½ hour without injury but an overload device trips out after 1½ to 3 minutes. The overload can be reset in a few seconds after tripping.

The doors and gates can be operated manually as easily as if the power drive were not attached. Car gates may be equipped with similar operators so the gate will be raised as quickly as the door is opened.

The cross-drive is covered to protect it against dirt. All gears are enclosed in an oiltight and dusttight housing. Ball bearings are arranged for pressure gun lubrication.

Failure of one unit will not shut down the others. A motor can be removed for inspection or replacement by removing three nuts, without blocking up the door.

Only normal shaft space is needed, see drawing below. Operators can be applied to old elevator doors. If space is limited, the cross-drive, and even the drive unit, can be placed on the roomside, being entirely enclosed and not interfering with the space around the opening.

The motor has capacity to operate all sizes of doors at less than ½ second per foot of opening height. A patented electric check retards the doors at the end of travel, to prevent excessive slamming.

Specially designed zone switches, with electro-mechanical interlocks, actuated by a cam on the car, prevent operation of the elevator unless all the doors are closed and latched.

Security designed, rugged, door operating buttons are placed near the car control. The "open" button requires momentary pressure; the "close" button requires constant pressure. A toggle type, emergency "stop" button will stop all door movement. With leveling type elevators, the doors may be opened automatically as the car stops at the floors. The doors may be closed by the car switch if desired. Doors and the car gate, when used, are operated by the same buttons.

Motors are available for 208 or 220 volts, 2 or 3-phase, alternating or 230 volts direct current, power. No motor-generator set is required.

"Seco" Door and "Uni-Motor" Specifications

For all openings to freight elevator shaft, except as noted, furnish and install metal clad "Seco" Doors as manufactured by the SECURITY FIRE DOOR CO., St. Louis, Mo. Door panels to be Type M-6, covered with flat galvanized steel sheets [or kalamein paneled] as shown on plans.

Furnish trucking bars to sustain a load of .... pounds and designed to transfer trucking load to opening sill.

Doors to be provided with adjustable shoes and are to be hung on ⅝-in. adjustable rods and heavy Security steel chains operating over 5-in. double race ball bearing sheaves. Doors to work in heavy angle guides securely fastened to opening frames and walls.

Doors shall be provided with web straps for manual opening and closing. Doors shall be equipped with electro-mechanical interlocks, with the necessary wiring for same. In lower corner of upper door provide 8x10-in. glass vision panel.

Where indicated on the plans, furnish and install "Seco Uni-Motor" electric door and car gate operators, complete with all necessary wiring, limit switches, operating buttons and master control.

The door movement shall be electrically retarded near the end of travel, in both directions, to prevent slam or jar.

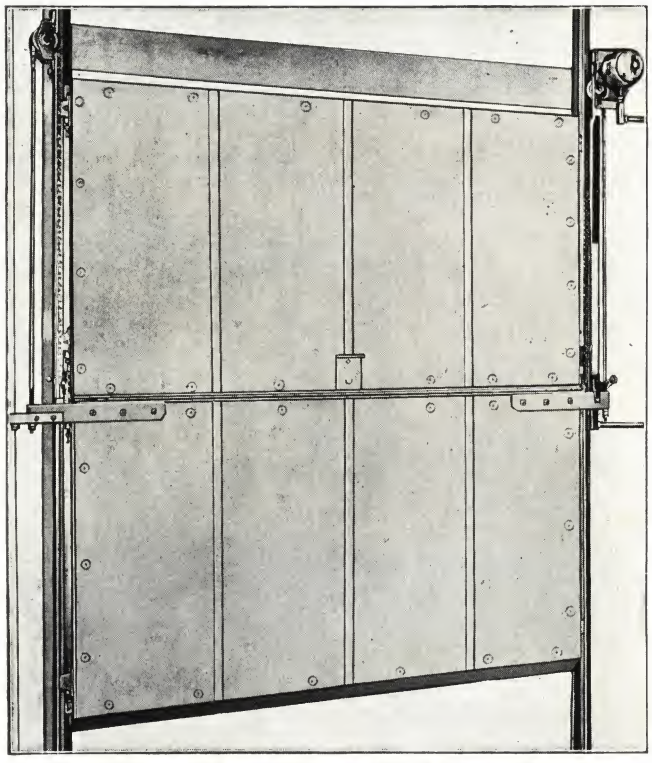
The operating equipment shall permit easy manual operation of doors and car gates in case of power failure without the use of any clutch or special releasing mechanism.

All to receive priming coat of paint at shop.

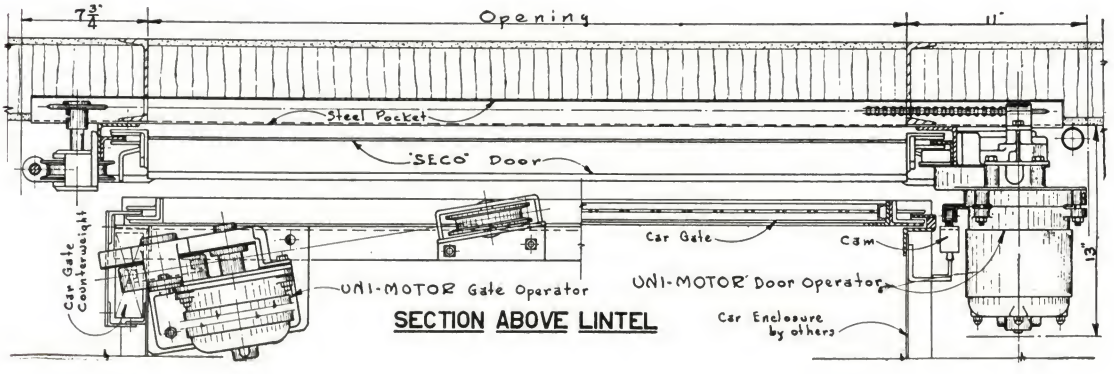
Door contractor to have the free and uninterrupted use of the running elevator when installing the doors.

All to be guaranteed against defects in material and workmanship for two years.

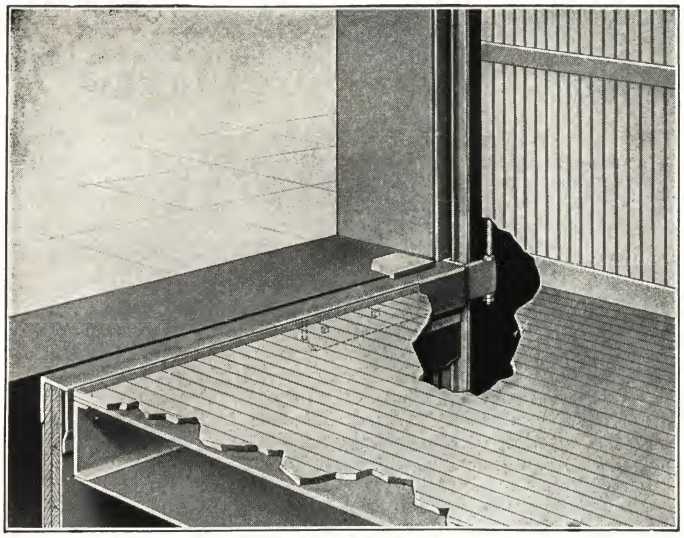
Steel frames and sill to be furnished under Miscellaneous Iron Work. Power line to penthouse with fused switch, by others.



Shaft View of Seco Door and Uni-Motor Operator Shown Above



Plan View Giving Space Requirements for Uni-Motor Installation Shown at Left



"Seco" Door with "Stay-set" Trucking Bar Support
Note that trucking load is supported by opening sill

Space Requirements for "Seco" Doors

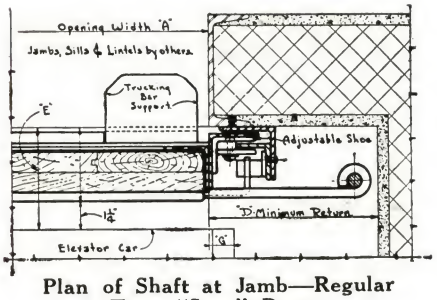
Schedule below should be consulted in order to determine highest opening obtainable in certain story heights for Regular and Pass Type "Seco" doors.

Also note other space requirements to insure a perfect installation.

SCHEDULE OF MAXIMUM OPENING HEIGHTS "SECO" DOORS
For Various Floor Heights

Opening height "B" ft.	in.	Minimum "C" for regular type ft.	in.	Minimum "C" for pass type ft.	in.
6	0	9	9	7	6
6	6	10	6	8	0
6	8	10	9	8	2
6	10	11	0	8	4
7	0	11	3	8	6
7	6	12	0	9	0
8	0	12	9	9	6
8	6	13	6	10	0
9	0	14	3	10	6
9	6	15	0	11	0
10	0	15	9	11	6

Note: Minimum "C" for Regular Type doors can be slightly decreased in special cases. Consult factory.

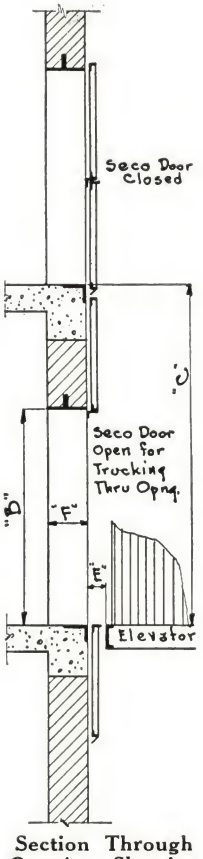


Plan of Shaft at Jamb—Regular Type "Seco" Door

CLEARANCE REQUIRED FOR "SECO" DOORS

Type	D, in.	E, in.
Regular type	7½	*4½
Pass type	8	6½

*Minimum.
Note: For wide openings or for heavy trucking loads, Regular type doors, both metal clad and corrugated, may require 5 or 5½ in. for clearance E.

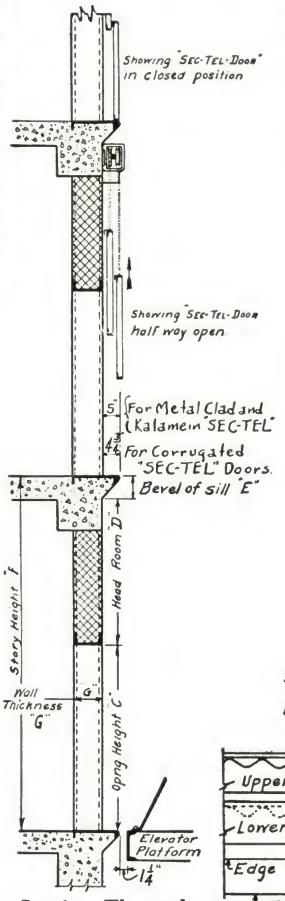


Section Through Opening Showing Regular Type "Seco" Door

When story heights are such that Regular Type "Seco" doors can not be used for opening heights desired, Pass Type "Seco" doors should be used.

"Sec-Tel" Door

"Sec-Tel" door is a two-section slide-up or vertical telescoping elevator door with corrugated steel, metal clad or kalamein panels. It permits the use of the permanent building sill for trucking over on to the elevator car. It operates in double guides, the lower half traveling twice as fast as the upper, so that as the lower section is raised, both sections are simultaneously set in motion and reach the lintel of the opening at the same time, giving a perfectly clear opening. The use of double race ball bearing sheaves and antifriction door guides assures ease of operation.

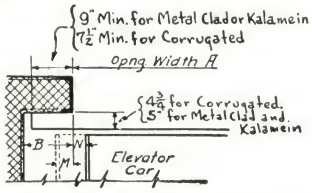


Section Through Opening Showing "Sec-Tel" Door Space Requirements

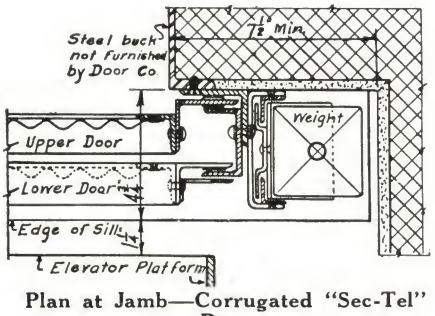
SCHEDULE OF OPENING HEIGHTS "SEC-TEL" DOORS
For Various Floor Heights Allowing 4 in. for Bevel "E" of Sill

Opening height "C" ft.	in.	Minimum headroom "D" ft.	in.	Story height "F" ft.	in.
6	0	3	5	9	9
6	6	3	8	10	6
6	8	3	9	10	9
6	10	3	10	11	0
7	0	3	11	11	3
7	6	4	2	12	0
8	0	4	5	12	9
8	6	4	8	13	6
9	0	4	11	14	3
9	6	5	2	15	0
10	0	5	5	15	9

Note: Space "D" for metal clad or kalamein "Sec-Tel" doors should be increased 6 in. if possible.



Plan of Shaft at Jamb—"Sec-Tel" Door



Plan at Jamb—Corrugated "Sec-Tel" Door

Kalamein and metal clad doors require 9-in. space at sides and 5-in. projecting sills

Corrugated "Sec-Tel" Door

Detroit Produce Terminal, Detroit, Mich.
UNITED ENGINEERS AND CONSTRUCTORS, INC., Engineers and Contractors
171 Wood "Horifold" Doors installed in this building. Doors are 14x8 ft.

"Horifold" Door

The "Horifold" door is a horizontal folding-up door, and can be made of wood, corrugated steel, tin clad or paneled wood metal covered sections.

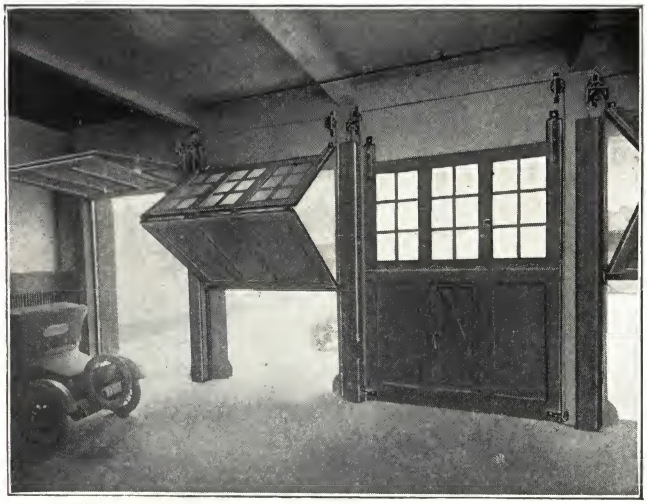
"Horifold" doors are suited for shipping platforms of warehouses, factory buildings, freight houses and garages.

"Horifold" doors are of rigid construction, operate with ease, and are unexcelled for withstanding severe weather conditions.

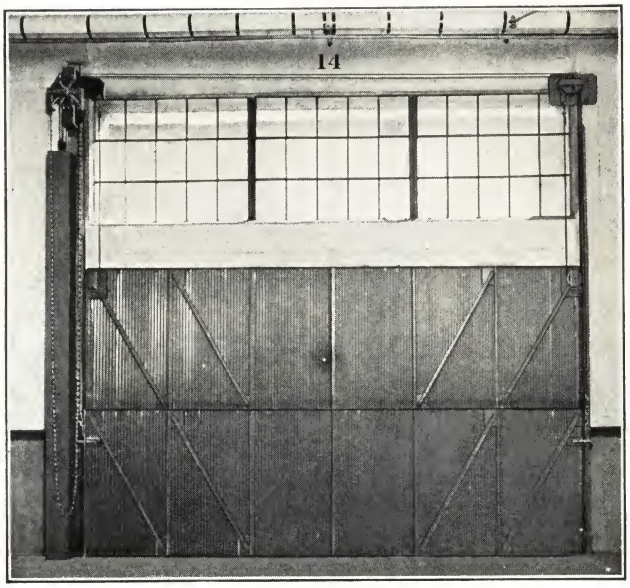
"Vertel" Door

"Vertel" doors are made of corrugated steel sheets riveted into angle frames. They can be arranged for glass in upper half to admit light, and with a wicket door in lower section. They are made in two sections, both of which travel upwards; the lower section traveling twice as fast as the upper section, reaching the lintel of the opening at the same time.

"Vertel" doors permit storage of material within a few inches of the door without affecting its operation.



"Horifold" Doors to Shipping or Garage Space



Security "Vertel" Door (Interior View)
Used for shipping platform and freight house openings. Above door is used on opening 16x9 ft. showing both door sections solid

TRUSCON STEEL COMPANY

Manufacturers of a Complete Line of Steel Doors

YOUNGSTOWN, OHIO

Offices and Warehouses in Principal Cities—For List see our pages on Steel Windows

Products

STEEL DOORS.

For other Truscon Products, see pages in this edition on Steel Windows, Steeldeck Roofs, Steel Joists, Channelplate and Tee-grid Floors, Safety-Tread Steel, Ferroclad Insulation, Reinforcing Steel, Complete Buildings and Metal Lath Products, as listed in Manufacturers' Index.

General

Truscon Steel Doors provide permanent, fireproof protection for industrial, commercial and other buildings. The complete line includes all types and sizes so as to meet efficiently the exact requirements of each installation.

Truscon Steel Doors are designed and built for maximum strength, enduring service, and easy operation. The highest grade commercial steel is used throughout. The frame is of tubular construction with corners mitered, welded and internally reinforced. The hardware conforms to the high quality of the doors and aids their easy operation. Truscon Steel Doors resist fire, withstand hard usage, are long-lived, never warp or stick, and require little maintenance.

Services

Truscon specialists co-operate fully with architects in developing steel doors which will promote the efficiency of buildings. Recommendations are made from a wide experience in door installations and an intimate knowledge of manufacturing possibilities.

Truscon will gladly study building conditions and offer suggestions for the type of door which will give the greatest satisfaction at economical cost.

Truscon supplements its large manufacturing facilities by stocking Standard Steel Doors for immediate delivery from Truscon warehouses in principal distributing centers throughout the country. Doors which are made to order are shipped promptly from our factories.

Catalog

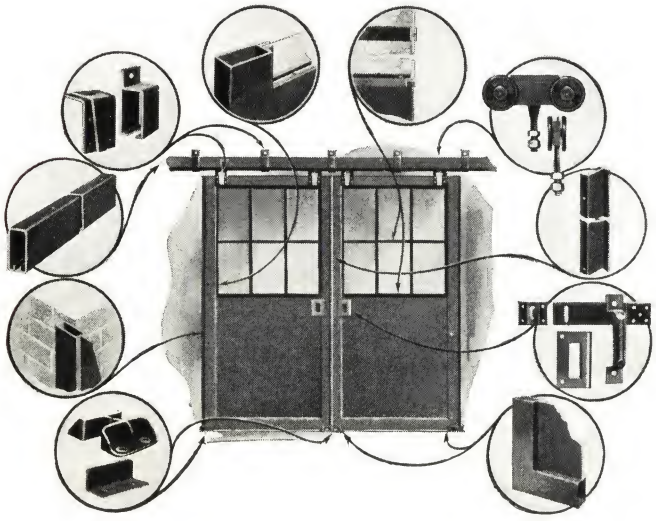
Complete catalog, 8½x11 in., 60 pages, containing full information about all types of Truscon Steel Doors, with details of their application, will be furnished to architects on request.

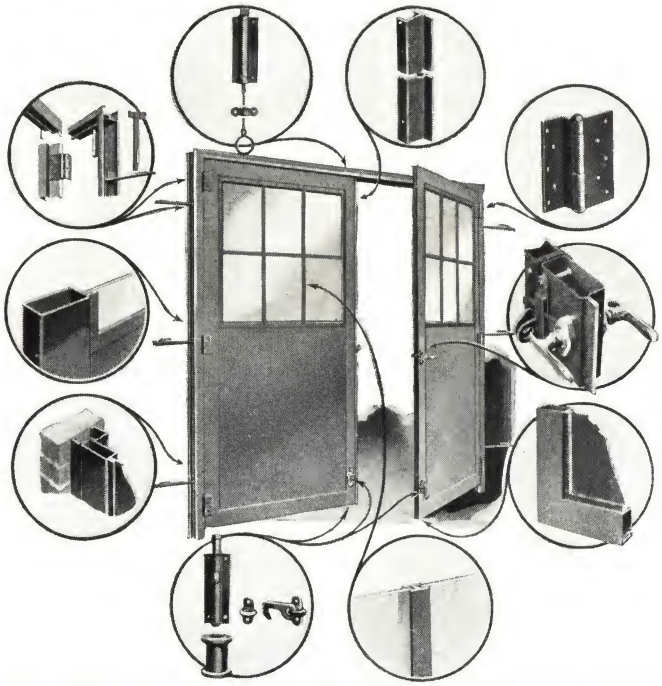
TRUSCON STANDARD STEEL DOORS

Truscon Standard Steel Doors, stocked in Truscon Warehouses throughout the country, are ideal for service entrances, furnace rooms, fire exits, pent houses, garages, service and filling stations, freight and power houses, and industrial and commercial buildings. Stiles and rails are of heavy tubular construction, corners are mitered and welded to provide strength where strength is needed. They are furnished in swing or slide types in sizes from 3x7 ft. to 5x10 ft. for single doors and from 6x7 ft. to 10x10 ft. for double doors.

Slide Type

Truscon Stock Type Standard Steel Doors, Slide Units, are mounted on four-wheel trolleys equipped with extra heavy duty roller bearing hangers and run on a sag-proof heavy duty channel track. Trolley brackets are attached to the door leaves where reinforcing occurs, thus insuring against local stresses in the steel of the door leaves. They are equipped with center stop and bottom guides to prevent prying the doors open when locked. Handles for opening and closing are of rigid construction. Hasp and staple are attached with through bolts to prevent burglary.





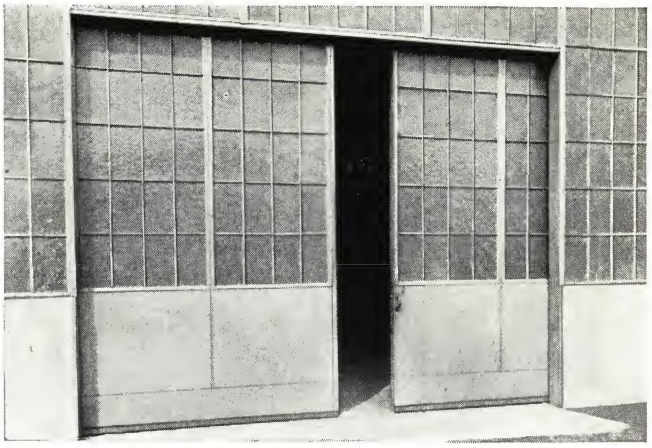
Swing Type

The door frames for Truscon Stock Type Standard Steel Doors, Swing Units, are of heavy pressed steel construction with door stop pressed into the frame. Mitering and welding at corners gives great strength. Double doors are equipped with lock bolt and socket for locking one leaf of double doors as well as a hook back and ring for holding doors open. A chain bolt for inside locking at the top is supplied for other leaf. Extra heavy duty hinges are always attached to door leaves where corner reinforcing occurs.

TRUSCON INDUSTRIAL STEEL DOORS FOR LARGE OPENINGS

Swing Type—Slide Type

Swing Type Industrial Door



Slide Type Industrial Door

Fireproof, durable, permanent and serviceable, Truscon Industrial Steel Doors for large openings are furnished in practically any size and arrangement, to meet every requirement where swing and slide doors are practical.

These Truscon Industrial Steel Doors are suitable for openings more than 10 ft. high and 10 ft. wide, and their durable efficiency has been tested through extensive use in industrial buildings of every description.

Truscon Steel Doors are made of best grade commercial steel. Stiles and rails are of tubular steel, mitered, internally reinforced and solidly welded at all corners, giving maximum strength. Size of tube and gauge of steel depend upon type, size and weight of door.

Harmonizing with the design of the building with which they are used, Truscon Industrial Steel Doors allow maximum daylight to enter the plant without sacrificing their sturdiness or rigidity.

TRUSCON CANOPY TYPE STEEL DOORS

A new Truscon product, designed and developed for installations in private and public garages, shop buildings, freight houses and all other kinds of buildings where a sturdy door can be raised to a position above the opening is desired.

Canopy Door in Private Garage

Standardization of design and sizes makes it inexpensive and maintenance is practically nothing. It is composed of a single leaf, which operates from a vertical position, when closed, to a nearly horizontal position above the door opening when fully opened, one half of the leaf extending into the building and the other half extending out to form a canopy over the door entrance. Door is counterbalanced so that it will remain in any desired position.

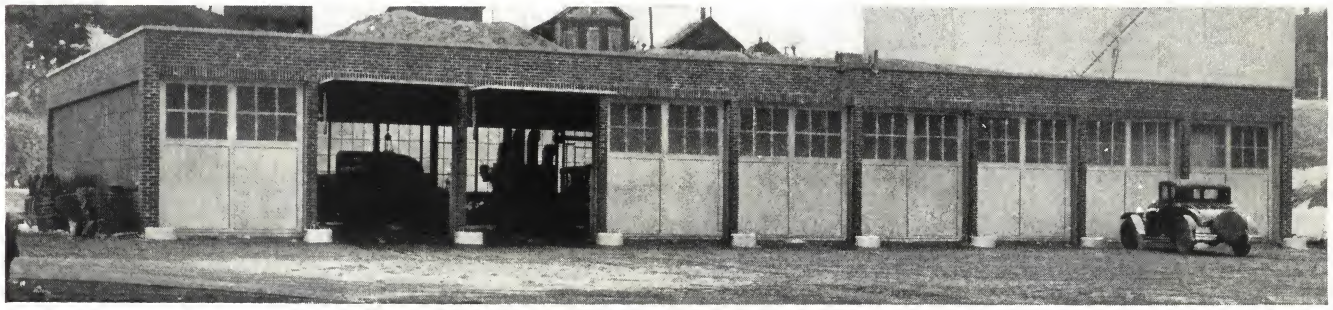
Stiles and rails are constructed of 14-gauge pressed steel tubes, mitred and internally reinforced at the corners. The mitred joints are welded and ground smooth. Steel panels in the lower portion of the leaf are spot-welded to stiles and rails.

The upper portion of the door is lighted with Truscon Standard Steel Windows of heavy section, spot-welded in place.

Operation is simple and easy—a pull of 15 to 25 pounds only being required to open the door fully.

Stock sizes are 8 ft. by 8 ft., and 8 ft. 6 in. by 8 ft. 6 in., but others up to 25 ft. by 25 ft. can be supplied. The larger sizes are built with structural shapes and are power operated.

Hardware includes: a cylinder lock; a lifting handle; roller guides at the jambs; two heavy swing arms to support the leaf and hold it true to line while opening and closing; heavy coil chain connecting leaf and counterweight and travelling over ball-bearing sheave wheels; a swinging handle, attached inside surface of the door at one edge, for use in closing.

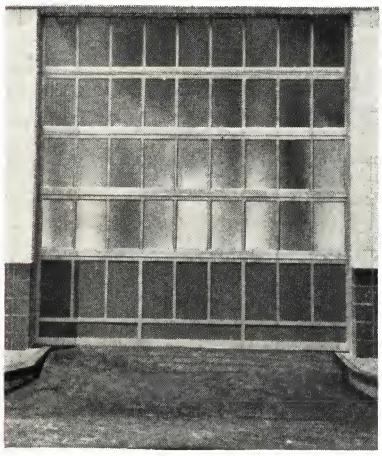


Canopy Door Installation in Sun Oil Bulk Plant, Cleveland, Ohio

TRUSCON ROL-UP STEEL DOORS

These doors are designed for use in garages, service stations, fire stations, warehouses, freight and express stations and wherever a sturdy, easily operated door is required. Being made of steel, the Rol-up Door has great strength, is firesafe and cannot warp, swell, rot, bind or shrink. Also, the sections are smaller, so that more daylighting is possible and a much neater appearance is presented.

Rol-up Doors possess all the inherent qualities of Truscon Steel Doors that insure long, satisfactory and economical service. The sections are hinged together to raise up and lie above and back of the opening in a horizontal plane, so as to be completely out of the way when opened. Rol-up Steel Doors may be placed in any opening that will receive any door of any other type. This feature makes it universally adaptable for buildings requiring doors ranging in size from small garage doors to doors 20 ft. wide. Weathering is provided at head, jambs and between sections.



Doors up to and including 9 ft. square are counterbalanced by means of springs. All doors larger than 9 ft. square employ counterweights suspended from spiral drums designed to counterbalance the door perfectly in any position. Handles and pull-down chains are furnished to operate the smaller doors, and on the larger doors a geared hand chain operator is supplied to provide means of fast, easy operation. In operating any Rol-up Steel Door, only sufficient energy is required to overcome inertia and friction.

Friction is reduced to an absolute minimum through the use of ball-bearing guide rollers and ball-bearings at every point where the door load is supported.

The smaller Rol-up Doors are built of heavy steel window sections, while the larger sizes are built of steel tubes or channels, as desired. Panels are steel plates and steel windows — the amount of solid and daylighting sections depending upon individual requirements.

Truscon Rol-up Steel Doors may be equipped for motor operation, which may include, in addition to a push-button control, a time switch to close the door at a pre-determined time after it is opened.

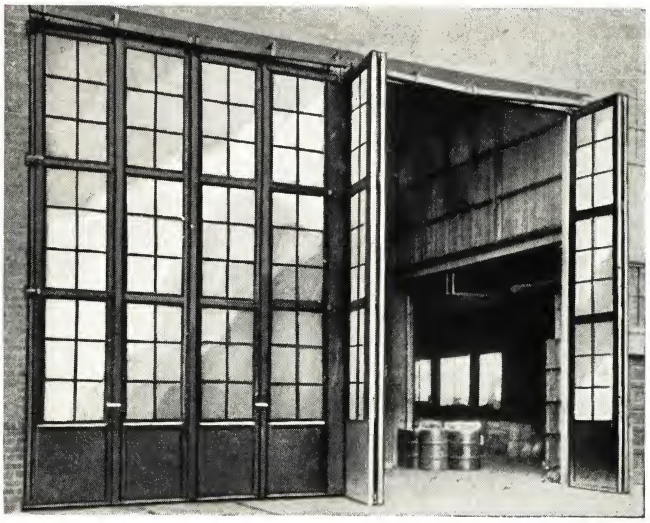
TRUSCON VERTICAL FOLDING STEEL DOORS

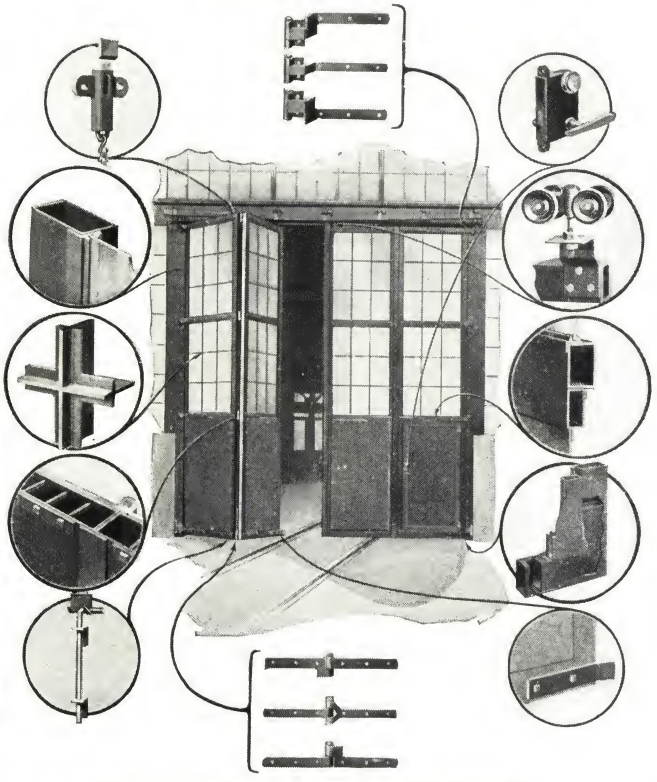
Truscon Vertical Folding Steel Doors are suitable for car and engine shops, warehouse buildings and other steam and electric railroad buildings requiring maximum height of door opening with minimum obstruction.

In operation the leaves fold like a jack-knife against each other and lie flat against the jamb when fully open. They are hung from Truscon Standard Roller Bearing Double Trolleys running on a heavy channel track and are equipped with flange guides, back stops, binders and complete hardware.

Stiles and rails are of heavy tubing with internal reinforcing at the corners to make sagging or twisting impossible. In operation they do not jamb or bind and one person can operate them with ease and speed.

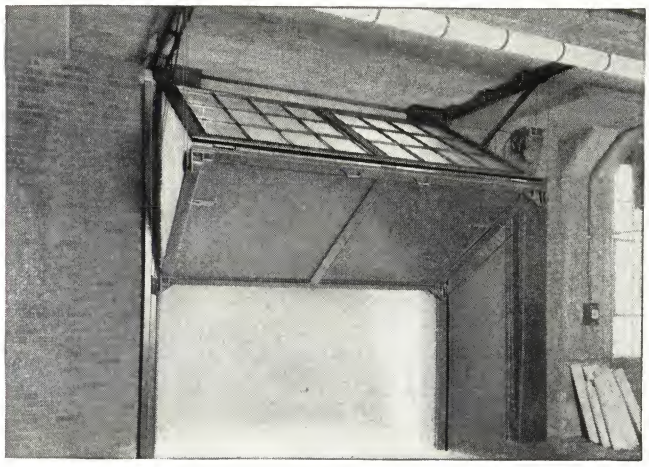
Standardized steel windows are incorporated into the upper portion of these doors for daylighting the interior of the building.





Construction Details, Vertical Folding Steel Door

TRUSCON BIFOLD STEEL DOORS



Truscon Bifold Steel Doors are designed for freight houses, warehouses, shipping and loading platforms where the distance between the lintel and the roof or ceiling is too scanty for Truscon Vertical Lift Type Doors. The hardware used for these doors has been designed to insure permanent efficient operation of the doors. The upper leaf is attached to the lintel by means of specially designed wrought forged steel hinges. Similar hinges attach the lower leaf to the upper and the lower corners of the bottom leaf are equipped with rollers to which a chain is attached.

These doors are counterweighted to balance in any position between complete opening and closing. They operate easily by means of hand chains, using a mechanical unit which will give years of carefree service. Individual doors or batteries of doors may also be equipped with electrical operating units, if desired, permitting fast, easy opening and closing.

When closed and locked Truscon Bifold Steel Doors make excellent protection against weather, and their uniform, neat design adds to the appearance of the building where they are used.

Each upper leaf may carry a Truscon Standard Steel Sash for daylighting the interior of the building or both panels may be of solid steel, as desired. Lighted sections, however, are especially desirable when a continuous line of doors is installed.

Bottom panels are heavy gauge steel plates, rigidly attached to the tubular frame with drive screws. Guides are constructed to allow free movement of the doors.

TRUSCON VERTICAL LIFT STEEL DOORS FOR HEAVY DUTY

On the shipping platforms of warehouses, at freight houses, wholesale and storage buildings, garages, etc., where it is desirable to have the full width of the door opening without any obstruction from the doors, Truscon Vertical Lift Steel Doors are recommended.

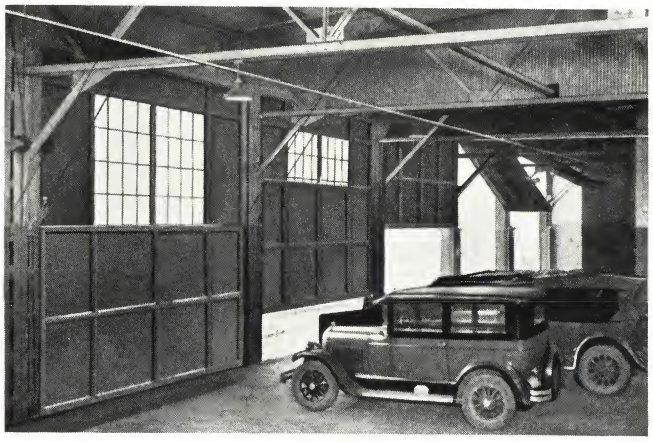
The Truscon Vertical Lift Door consists of two leaves which slide against each other when raised and which clear the door opening when fully open. In providing clearance, the distance from the top of the door frame to the ceiling or roof must be one-half the height of the door opening plus 1 ft. 8 in., which is the space necessary for housing the operating mechanism.

The upper leaf of the Truscon Vertical Lift Door is fitted with Truscon Steel Sash, allowing adequate daylight to penetrate to the interior of the building. The lower leaf has heavy 12-gauge steel panels.

The doors can be easily raised and lowered by hand, but they may be fitted for electric power operation if desired.

Their rugged construction and the heavy plate used on the lower leaf of the door makes these doors an effective barrier against trespassers.

TRUSCON VERTICAL LIFT-SWING STEEL DOORS



Truscon Vertical Lift-Swing Steel Doors meet the conditions in pier buildings and warehouses where the door opening must have maximum clear height and unobstructed width. These doors are built to stand much punishment, daylight the interior, open and close easily and protect the warehouse against thievery.

Truscon Vertical Lift-Swing Doors are built of rectangular tubing reinforced at all corners and intersections and welded together with welds ground smooth. This makes a solid, crackless unit of great strength that keeps out water. Their high grade steel construction retards the corrosive influence of the salt air. The panels are a combination of 12-gauge steel plates and Truscon Standard Steel Windows glazed with wire glass.

Each Truscon Vertical Lift-Swing Door is divided horizontally into two equal sections. The upper section contains the glass and provides daylighting for the interior. The lower solid section slides vertically in guides on the door jamb into guides on the upper section, which is hinged at the top. The nested sections can then be swung inward to any angle up to a horizontal position, so the door is completely out of the way.

The raising and swinging movements are accomplished by operators with hand or power control. If desired, pilot doors can be provided in the lower leaf of the door.

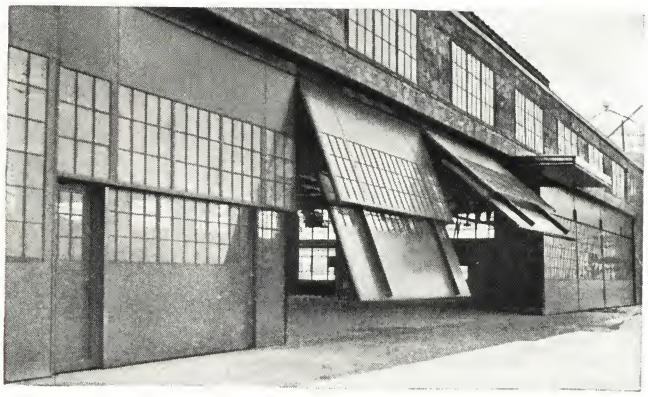
TRUSCON TELESCOPING CANOPY STEEL HANGAR DOORS

Designed to meet the ever increasing demand of airways operators for an electrically operated hangar door that offers fast operation with a resultant saving of heat and increased efficiency in a highly paid mechanical personnel freed from the burdensome task of moving a multiple leaf slide door by hand.

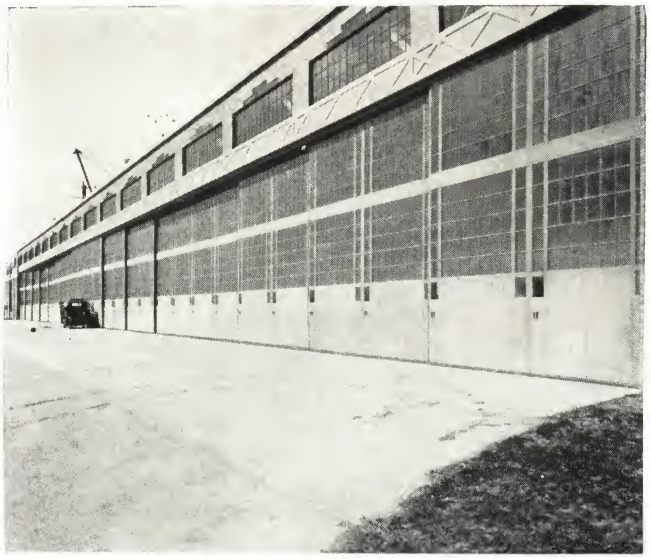
Truscon Telescoping Canopy Hangar Doors in their movement require no space inside the hangar and consume a minimum of apron space. Each door is divided horizontally into two equal sections. The upper section is pivoted at the front truss and swings outward and upward. The lower section raises and swings simultaneously with the swing of the upper section. The canopy formed when the leaves are in this position is equal to one-half the opening height. The door does not project inside the building to interfere with the lighting or sprinkler systems. The opening may be divided vertically into any number of doors, varying from 20 to 100 ft. to suit individual operating conditions.

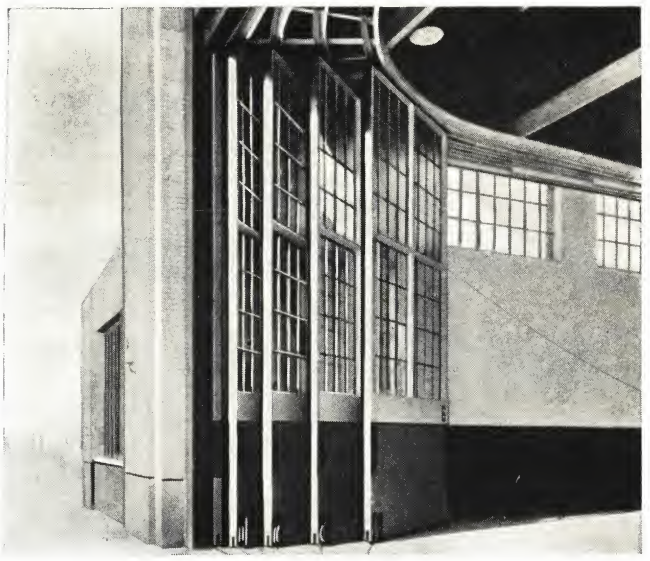
The doors are built of hot-rolled structural steel shapes of sizes and weights to suit the dimensions and operating conditions of particular hangar openings. The door panels are a combination of 13-gauge steel plates and Truscon Standard Steel Windows. The electric operator is a mechanical perfection developed by Truscon engineers to provide fast, quiet, positive operation. Fast emergency hand operation is provided to open the door in case of power failure.

The basic design of the Truscon Telescoping Canopy Hangar Door locks the door securely in any position. These same basic principles keep the loads imposed on the front truss at a minimum with the result that the truss supporting the door will be approximately the same weight as a typical truss.



TRUSCON HANGAR DOORS—STRAIGHT SLIDE AND CURVED TRACK TYPES





Truscon Airplane Hangar Steel Doors meet the specialized requirements of the aviation industry and they have repeatedly demonstrated their practical service qualities in all kinds of large and small hangars. They permit the unobstructed entrance and exit of airplanes and provide ample daylighting by means of any desired window area in the upper section of the door. Special operating devices for large doors insure easy and quick opening and closing, either by hand or mechanical power. The perfect adjustment and balance of the doors permit manual operation when mechanical operation is deemed not expedient. The doors are comparatively light in weight, but, due to their design, have great strength and durability.

Cold-rolled, high grade welded steel tubing is used in the stiles and rails of doors up to 22 ft. in height, although the doors may be designed with structural steel channels. Above 22 ft. the standard construction is with structural channels and I-beams. All standard doors are designed for 15 lb. per sq. ft. wind pressure, but strength for higher pressures may be provided for. The door units run on tracks which are embedded in the floor so as to relieve the overhead construction from supporting their weight.

Straight Slide Type

This type of door operates by sliding along a straight track, telescoping into a minimum space at the ends of the hangar building. The malleable iron wheels have ball and thrust bearings so that operation is easy, each door unit being equipped with a concealed door wheel lock. The head of the door has steel rollers attached to it which run along overhead guide tracks with minimum friction. Being made of steel and properly weathered, the doors are weather-tight at all points.

Curved Track Type

This type of door was developed to meet the requirements for a door to close the entire side of large hangars. In operation, the doors roll along curved tracks so that when open they lie flat against the inside wall of the hangar to allow maximum opening. Each door is mounted on heavy malleable iron wheels encased within the door, these wheels being equipped with roller swivels and ball bearings. Bronze bushed rollers at the door head act as guides when the door moves on the track. Operation may be manual or motor, one motor handling as many doors as move in one direction from the center of the opening.

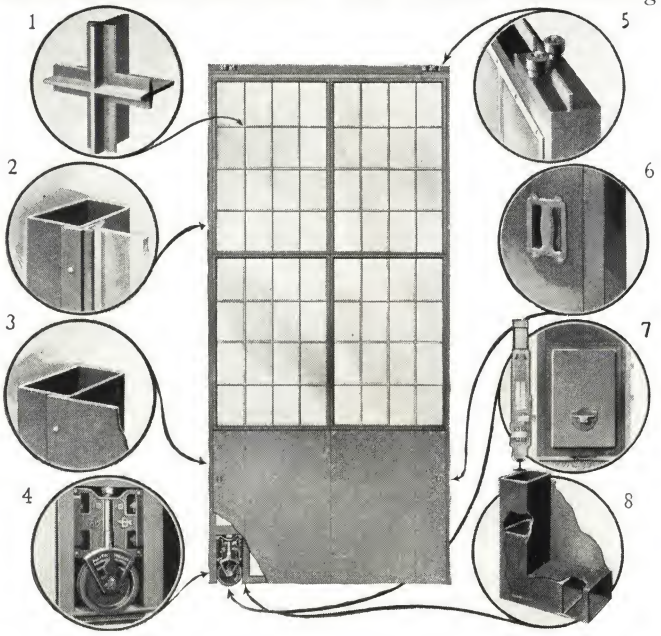
Construction Details—Tubular Hangar Doors

(1) **Dovetail Mitre Joints**—Give added rigidity and small muntin bars offer minimum obstruction to light.

(2) **Glazing Angles**—Hold glass firmly in sash.

(3) **Steel Panels**—Give a plane, smooth surface without any openings or recesses.

(4) **Malleable Iron Wheels**—For curved track type, mounted in malleable iron housing with roller swivel and Timken roller bearing on vertical shaft. Equipped for Zerk system of lubrication. Wheels for straight slide type are similar, except for swivel.



(5) **Steel Rollers**—Attached to head of doors to run along overhead guide tracks.

(6) **Flush Type Handle**—In door panel.

(7) **Lock Type Bottom Roller**—Each door unit may be equipped with an Allith-Prouty lock type bottom roller or with a heavy wrought iron double-acting cane bolt for locking door to floor when in closed position.

(8) **Stiles and Rails**—Are mitred and internally reinforced 12 in. in each direction at the corners.

VULCAN RAIL & CONSTRUCTION COMPANY

Manufacturers of Underwriters' Fire Doors

MAIN OFFICE AND WORKS

Grand Street and Garrison Avenue, MASPETH, N. Y.

BRANCH OFFICE AND SHOPS: 39th Street and A. V. R. R., PITTSBURGH, PA.

Products

VULCAN "ALL-STEEL" FIRE DOORS.

For our pages on Pipe, Stair and Bridge Railings, Pipe Bends, etc., see Manufacturers' Index.

Underwriters' Approval

The steel fire doors and frames manufactured by this company are made in accordance with the specifications of Underwriters' Laboratories, Inc., are inspected by them and carry their Class "C" label.

TRADE-MARK

Vulcan "All-Steel" Fire Doors

Use—These doors are designed for the protection of corridor and partition openings. They are especially suitable for installation in compartment openings in furniture storage warehouses.

Equipment—This type door is furnished with buck and hardware complete, except padlock.

Construction—The entire door, frame and hardware is of steel construction, and all material is painted one shop coat before shipping.

The door sheet is made of blue annealed steel, securely fastened to an angle iron frame, suitable provision being made for expansion in case of fire. This angle frame is braced at intervals of not over 20 in. by cross angles riveted to the door sheet.

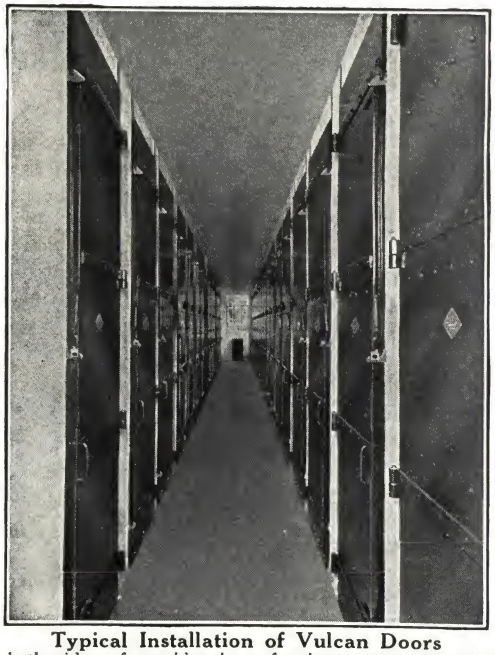
Hardware consists of four strap hinges and a three-point latch with spring to hold latches in their keepers. Latch handles extend through the door to permit opening from both sides.

Buck is made of standard rolled steel channel and is furnished 1 in. wider than partition. It runs from the finished floor to the ceiling and is securely fastened to both. Hinge pintles and latch keepers are riveted to channel jambs in the shop. Doors are usually made 3 ft. x 8 ft. 4 in. or 3 ft. 4 in. x 8 ft. 4 in. but can be furnished any size up to 4 ft. x 10 ft.

Further Information

Complete detailed drawings, together with further information and prices will be gladly sent on request.

Two Standard Vulcan Doors
One closed and the other partly open



Typical Installation of Vulcan Doors
On both sides of corridor in a furniture storage warehouse

Some Typical Installations

Metropolitan Fireproof Warehouse, New York, N. Y.
Knickerbocker Storage Warehouse Co., New York, N. Y.
Manhattan Storage & Warehouse Co., New York, N. Y.
Job De Camp, Inc., Newark, N. J.
Security Storage Co., Washington, D. C.
Thomas F. Healey & Son, Inc., Brooklyn, N. Y.
Neal Fireproof Storage Co., Cleveland, Ohio
Long Island Storage Warehouse, Brooklyn, N. Y.
Lansing Storage Co., Lansing, Mich.
George B. Holman & Co., Inc., Hackensack, N. J.
W. H. Strang Storage Warehouse, Brooklyn, N. Y.
Flushing Storage Warehouse Co., Flushing, L. I., N. Y.
Neptune Storage Warehouse Co., New Rochelle, N. Y.
O'Brien Express Co., New Rochelle, N. Y.
Eldredge Express & Storage Warehouse Co., Atlantic City, N. J.
Rochester Carting Co., Rochester, N. Y.
Estate of Orrin E. Jones, Providence, R. I.
King-Parker, Inc., New York, N. Y.
Interstate Warehouse Co., Philadelphia, Pa.
Hempstead Storage Corporation, Hempstead, N. Y.
Santini Warehouse, New York, N. Y.
Wm. H. Schaefer & Son, Inc., Stamford, Conn.
J. Kindermann & Sons, Inc., New York, N. Y.
Federal Storage Company, Washington, D. C.
Lehigh & New England Terminal Warehouse, Bethlehem, Pa.
Lincoln Safe Deposit Company, New York, N. Y.
Allport Storage Warehouse Company, Asheville, N. C.
Morgan & Brother Warehouse, New York, N. Y.

THE NEWMAN MANUFACTURING CO.

FOUNDED IN 1882

PLANT

CINCINNATI, OHIO

SALES OFFICES IN ALL PRINCIPAL CITIES OF THE UNITED STATES

For our pages on Ornamental Metal Work and Lighting Fixtures, see Manufacturers' Index

BRONZE, ALUMINUM, NICKEL AND MONEL DOORS, FRAMES, TRIM AND ENCLOSURES

Revolving Doors

Hollow bronze, aluminum, nickel silver, monel and steel revolving doors.

Kalamein bronze and steel revolving doors.

Wood revolving doors.

Ask for our Revolving Door Portfolio, containing details of a radical departure in panicproof revolving door construction.

Metal Doors

Solid cast bronze, aluminum and *nickel doors.*

Hollow bronze, aluminum, nickel silver, Benedict Nickel, and *Monel Metal doors* and *trim.*

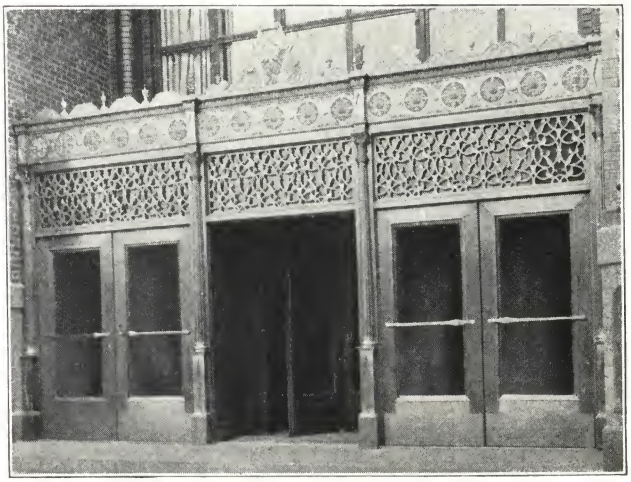
Extruded bronze, nickel and *aluminum doors.*

Write for standard details, suggested specifications and complete information on metal doors.

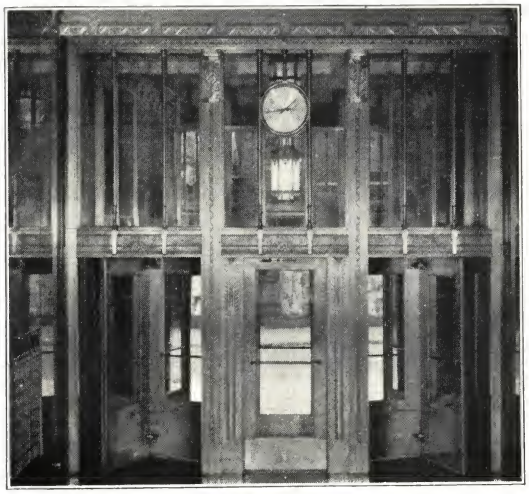
Hazel-Atlas Building, Wheeling, W. Va.
EDWARD FRANZHEIM, Architect

Carew Tower, Cincinnati, Ohio
WALTER W. AHLSCHLAGER, INC. and DELANO & ALDRICH, Associate Architects
(7 sets of doors)

Cranlyn Apartments, Brooklyn, N. Y.
H. I. FELDMAN, Architect



R. E. Olds Building, Lansing, Mich.
HOPKINS & DENTZ, Architects



19 Rector Street Building, New York, N. Y.
LAFAYETTE A. GOLDSTONE, Architect

THE ATCHISON REVOLVING DOOR CO.

MAIN OFFICE AND FACTORY

INDEPENDENCE, KAN.

AGENCIES IN 70 OF THE PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

Consult City or Telephone Directory for Name of Nearest Representative or Write the Main Office

AN IMPORTANT STATEMENT

ADDRESSED TO ARCHITECTS, SPECIFICATION WRITERS AND CONTRACTORS

The following comments and suggestions are addressed to the men who are responsible for the actual specifications and those who do the buying and erecting of revolving doors.

The comments are made by a company which has been in business for 60 years and which has been through many of the ups and downs in this industry. Through it all, the aim and ideal of the Company has been the production of the best possible product at a reasonable price, including a profit. We have kept to the policy of making one price, a fair one, and as low as the quality of work for a particular job would permit.

We believe that both architects and contractors desire workmanship and materials to be of such a quality that they will stand up and give satisfaction to the owner for years. This being the case, it is absolutely necessary to use good materials of a weight, strength and quality which will give the expected service and at a fair price. If a contractor is forced to cut his price he has to do one of two things, either cut on the quality of his materials and workmanship, or lose money on his contract. If a manufacturer loses money on his jobs he cannot remain in business very long.

An Appeal to Architects to Insist on Quality as Specified

In all Federal, and in most State practice, the enforced and ideal practice is carried out in regard to bids. The contractor and sub-contractor are confined to one bid and that to plans and specifications. The other practice of taking jobs at cost and below and then cutting down on the quality is one which should be condemned.

This Company refuses to do business in that manner. We propose to give the architect the quality of material and workmanship he specifies and will require—at one price. On this policy we will stand or fall and we ask that all bids be considered on this basis of the best price first, and that a sub-bid used by a winning contractor be considered an order placed.

There Should Be a Specific Specification Heading for Metal Revolving Doors

Much trouble would be avoided during the progress of the work and better prices could be obtained if the Metal Revolving Doors are given a special heading or trade classification rather than being specified with general ornamental metal work or with the metal door contract.

Metal Revolving Doors are a highly specialized product, and should be made with the proper facilities and machinery by the revolving door manufacturers. This work should not have to go through a middle man, who generally does not want the responsibility of handling them, anyway. When the middle man handles the contract, he has to include his profit and overhead. This adds to the cost of the door.

We have made a canvas among the ornamental iron and bronze concerns in the United States and a large majority stated that they would greatly prefer that such a specialty, as that of metal revolving doors, be taken out of their work and bought direct by the general contractor.

Co-operation Between Ornamental Iron and Bronze Concerns and Ourselves

The co-operation between the drafting department of the ornamental iron and bronze industry and our own is as easy under direct buying as under the sub-contract of the metal contractor.

Proper Placing of Responsibility

Responsibility for the proper operation and the conformance to the specifications is properly that of the door maker. No useful purpose is therefore served in passing this highly specialized item through the hands of any middle man, thereby dividing this responsibility.

Metal Revolving Doors Should Be Made by Specialists

The metal revolving door business is not a large one but it does require special equipment and knowledge of requirements to make them. The mechanism is intricate and, in order to produce it at a profit as well as at a low price, it requires concentration by a company on this specialty of door construction and equipment. There is always a clean, sharp cut line between revolving doors and adjacent metal work. Therefore, there is no reason for specifying the door under metal work or with the other metal doors of the building.

An Appeal for Properly Classified Specification

This Company appeals to the Architects and their Specification Writers to see that the Revolving Doors are placed under a heading which will allow them to be handled direct with the general contractor in the same manner that mail chutes and other specialties of like nature are handled.

In Conclusion

The Atchison Revolving Door Co. has had pleasure in producing doors for many buildings, a few of which are illustrated on the following page. We are proud of the work we have done. We are equally proud of the confidence which many members of the Profession, as well as general contractors, have in us and our work.

1. Hotel Harrisburger, Harrisburg, Pa.
2. Park Plaza Hotel, St. Louis, Mo. (2 Doors)
3. New York Life Building, New York, N. Y. (14 Doors)
4. Terminal Tower and Medical Arts, Cleveland, Ohio (13 Doors)
5. Trustees System Building, Chicago, Ill. (3 Doors)
6. Lincoln Building, New York, N. Y. (7 Doors)
7. Allis Hotel, Wichita, Kan. (2 Doors)
8. Merchandise Mart, Chicago, Ill. (7 Doors)
9. Rand Tower, Minneapolis, Minn.
10. First National Bank & Trust Co., Freeport, N. Y.
11. State National Bank, Fort Worth, Tex.
12. Hotel Adolphus, Dallas, Tex. (2 Doors)
13. Webster Hall, Detroit, Mich.
14. Prairie Oil & Gas Building, Independence, Kan. (2 Doors)
15. First National Bank, Portland, Ore. (3 Doors)
16. Northwestern National Bank, Minneapolis, Minn. (3 Doors)
17. City Hall, Oakland, Cal.
18. Mellon National Bank, Pittsburgh, Pa. (6 Doors)
19. State Capitol, Oklahoma City, Okla.
20. New York Times Brooklyn Plant (2 Doors)
21. Canal National Bank, Portland, Me.
22. California Automobile Association Building, Oakland, Cal.
23. World's Fair Administration Building, Chicago, Ill.
24. Union Trust Building, Cleveland, Ohio (13 Doors)
25. Hotel Statler, Boston, Mass. (8 Doors)

Products

REVOLVING DOORS, complete with wings, enclosures, cornices, pilasters, ornament (or without all trimming, where these duplicate adjacent similar work). ADJOINING SWING DOORS, TRIM and ACCESSORIES.

In bronze, all white metals, and cabinet woods.

Wings alone furnished only for marble enclosures, not for wood or metal enclosures by others.

Revolving Doors

Conserve Health—Through preventing drafts, controlling ventilation and keeping out dust.

Save Floor Space—By automatically dividing in-and-out traffic, by steady, constant traffic flow, and by perfect air-lock.

Increase Capacity—Passing 3,000 to 6,000 persons per door per hour, each direction. (Higher than swing doors.)

Help Control Air Conditioning—By being "Always Open" to traffic and "Always Closed" to air. Summer cooling costs double winter heating. Revolving air-locked doors are indispensable for cooling systems.

Pay Dividends—By returning up to 20% of cost annually in fuel or power savings, by greatly reducing dust damage to merchandise, by increasing rentable area, and by making usable areas close to entrances.

General Data

Wood—Wings and enclosures of all cabinet woods veneered with 5-ply laminated waterproof construction, making one-piece or slab wall sections or wings with correspondingly greater strength. All are veneered, so soft woods are no cheaper than oak or gumwood.

Painters' finish regularly supplied in two grades, 3-coat gloss, or 4-coat hand rubbed, to approved samples.

Metal Covered—Bronze, nickel silver or other white metals in 16-gauge-overlay (recommended) or 20-gauge kalamein, applied with special metal holding adhesives, in an 11-ft. power press, to hardwood faced laminated waterproof cores. Hairline joints are re-inforced with riveted sweated strips. This construction is recommended in preference to hollow metal for all except welded tubular aluminum wings, because of (1) greater stiffness to resist unusual twisting strains in wings, (2) less weight for necessary stiffness, reducing undesirable momentum and inertia effects, (3) lower cost, and (4) greater fire resistance.

Finishes to match adjacent work. Fine-lined natural or medium oxidized recommended, not lacquered. Samples on request.

Hollow Metal—Enclosures in 10 to 14 B&S gauge on steel frames, wings in 12 to 16-gauge on steel channel frames especially designed for stiffness.

Hollow Aluminum Wings—Developed in collaboration with Aluminum Co. of America, are one-third to one-half the weight of any other wings, very strong and stiff, easy to revolve and quick to stop. They are considered one of the biggest improvements since the "Curved Wing."

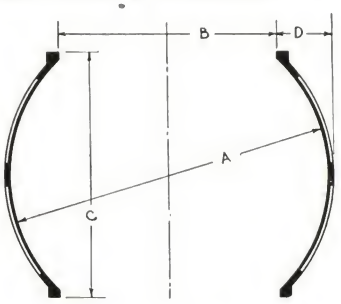
Hardware—Of heavy, plain beveled design, solid cast bronze, nickel silver, aluminum or chromium plate. No other plating recommended or furnished.

Cylinder locks, standard or master-keyed, operant from inside and outside, are standard equipment with all full-folding types, optional with side-rolling types.

Marble Enclosures—Atchison full-folding Type PB, NLE or NLD wings are ideal for use with marble enclosures, as no ceiling slot is needed, only a 1¾-in. center hole, and ceiling slabs can be supported from the bearing channel which lies directly above them, at any angle, with ends resting over marble walls. Always provide relief bevel at ends of walls. (See wall-end E, our page 10.)

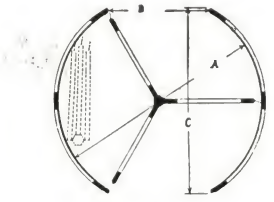
Size—See dimension tables and cuts above. 4-wing doors *should not be less* than 6 ft. diameter. A near-standard has come to be 6 ft. 6 in. which will pass traffic comfortably. Hotels find large doors useful for handling luggage, up to 7 ft. 6 in., or even 8 ft. diameter. Elsewhere, doors should not be larger than 7 ft. diameter, reducing the temptation for two persons to crowd into one pocket. Inside height should be 6 ft. 10 in. to 8 ft., the near-standard being 7 ft.

3-wing doors are good only for limited traffic since in-and-out-traffic interferes (except in the case of type HC 3-wing doors, see our page 5), and are used where space will not permit a 4-wing door, or for inside air-lock passages and toilet room entrances in schools.



4-Wing Door

A	B	C	D
6 ft.	4 ft. 2 in.	4 ft. 7 in.	1 ft. ⅜ in.
6 ft. 6 in.	4 ft. 6 in.	4 ft. 11½ in.	1 ft. 1⅜ in.
7 ft.	4 ft. 10 in.	5 ft. 4 in.	1 ft. 1 in.
7 ft. 6 in.	5 ft. 2 in.	5 ft. 8½ in.	1 ft. 2 in.
8 ft.	5 ft. 6 in.	6 ft. 1 in.	1 ft. 3 in.



3-Wing Door

A	B	C
4 ft. 6 in.	2 ft. 2½ in.	4 ft. 2 in.
5 ft.	2 ft. 5½ in.	4 ft. 7 in.
5 ft. 6 in.	2 ft. 8½ in.	4 ft. 2 in.

Glass—Furnished in polished or drawn plate. Avoid internal angles which cause breakage, or beveling which interferes with sight in revolving doors. Bottom rail heights—allow 24 in. from floor where possible, with minimum of 18 in. to permit bracing point not too far below push-plate and give room for drop-braces where they occur. Door wings get far greater twisting strains than swing doors.

Access to Bearing—Space over door *should* be accessible for oiling and adjusting main bearing. Ceiling access panels can be had, but are undesirable.

Base-plates—Of bronze, nickel, monel, or stainless steel, are quoted separately for wood doors and should be used to prevent water damage to walls, or finish. Standard on all metal doors.

Motor Drive—May be had; the full-folding type wings are especially adapted to it because the center bearing is stationary. All mechanism mounted on main bearing channel. Three speeds. Continuous operation, push-button or floor mat control. ¼ hp. needed. Drives through friction clutch which allows stopping door or motor without damage, and provides best known brake against over-speeding.

Air-lock Strips—Consist of wide bottom rubber for flexibility, thick woven felt top strips, and tapered molded side rubbers of anti-aging composition with piano-felt edges, all especially selected and designed for maintaining the air-lock with proper amount of friction.

Curved Wings—An exclusive basic feature, and the only improvement ever made affecting the *revolving value*. They increase "usable" space by 6 in. in front of the body and allow a natural, easy, upright step without leaning forward or stubbing toes and make it "more than a fourth" easier to pass through. "Curved Wings" are furnished at actual extra cost under a policy of many years standing. Experience has shown that bent glass breakage is rare. A replacement light can be carried, or furnished by us from stock.

Provide for the Future—Even if revolving doors be not used, by arranging the entrances so they may be installed with least alterations. Very many new buildings find after a year or two of use that they must have this positive air-lock entrance. *Ask Atchison for suggestions.*

Facilities—Atchison doors are made in a modern type saw-tooth daylighted one-story plant, with woodworking, metal-working, hardware, foundry and finishing departments, with all necessary dry-kilns, motor driven machines, bending equipment, presses, etc., in a landscaped setting.

Location—A small town location means low living and labor costs. With good shipping facilities, and new "over-all" rates, costs are kept comparatively low to any part of the country.

Patents—Patents have been taken out on the "Curved Wing" and other features as developed, and while not relied upon to force higher prices, infringement will be vigorously resisted.

Quotations and Ordering—Agents can usually quote on stock designs. Due to the many variable factors of design, material, type, finish and equipment, special doors must be quoted by the home office.

Sketch plans and suggestions furnished promptly. Send rough sketch of present entrance on old buildings.

We urge the placing of orders in spring and summer to avoid seasonal demand peaks in fall and early winter.

Specifications—Can be readily drawn from the data herein, or several forms of both open and closed specification are available on request, stating what features are favored.

CLASSES AND TYPES OF DOOR WINGS

Atchison door wings are made in two general classes; "Full-folding" in which wings fold a pair to each side, and "Side-rolling," in which they fold into one plane and roll aside on an overhead carriage.

In each class, the wings may be safety-exit or panic-proof type, folding in one pack outwardly under panic conditions, or they may be standard collapsing or non-panic proof.

The wings of either class or type may be straight or "Curved."

1 2 3 4 5

Full-Folding Types NLE and NLD Wings

Types NLE and NLD

These types take the positions shown above and are safety-exit or panic-proof and also full-folding in either straight or "Curved Wing." The wings are hung with the "link hinge" to a square split center-post which parts for folding a pair of wings to each side (Drawing 4), on powerful pivot mechanisms of the Cremorne type. Revolving, the wings hang from a central headed stem and an overhead cup-and-cone ball bearing, all stationary and requiring no ceiling slot. Locking is inherent by regular cylinders applied to control the pivot operators, and wings fasten at four points, top and bottom and both sides of opening, (Drawing 2), secure from racking or twisting as when locked at ceiling only, and operant from inside and outside.

Type NLE has large cored section cast bar braces to hold wings in normal radial position, (Drawing 1), one end universally hinged, the other releasable with an adjustable non-corroding ball-and-socket catch. The braces push or pull out under excessive pressure and allow wings to swing outwardly into one pack (Drawing 5) and give exit on both sides without revolving.

Type NLD has cable braces of heavy monel tiller rope, automatically releasable by pressure against the inner ends of the push-bars, where pressure develops in a panic rush, same as Von Duprin or Russwin exit bar-locks. But NLD cable braces will *not* let go under excessive wing pressure, as in high winds or crowded sale rushes. They can be released for ordinary handling by a thumb piece at the latch. Due to their positive holding power, there is included in one brace of each door a toggle action tightener. Closed, it pulls all braces up snapping tight. Open, it gives ample slack for easy connecting. Braces are adjustable for length.

6 7 8 9 10

Full-Folding Type PB Wings

Type PB wings are full-folding, but not safety-exit or panic-proof, taking the positions shown above. Drawing 6 shows "Curved Wings" in a ceiling-lock position and Drawing 7 in the regular folding and full locked position, from which it can be unlocked at sides to revolve, or released from interior only at the center, to fold a pair to each side (Drawing 9). All 4-wing doors can also have wings placed in lengthwise position (Drawings 3, 8, 13, and 18). Both straight and "Curved Wings" fold aside with the same economy of space (Drawings 9 and 10), but the "Curved Wings" look more natural and sightly.

Note: See information relative to Drawing 23 on our page 5.

Type PB wings are spread by cast bar braces, hinged to one wing to rise up and engage the other wing with a wedging action which avoids looseness or chatter.

11 12 13 14 15

Side-Rolling Type NLK Wings

Type NLK wings are side-rolling and panic-proof, taking positions shown above. With a special diagonal ceiling slot they can also place to one side (Drawing 21 below) requiring a side floor socket to hold the center pivot. The wings are hung with a universal springless link hinge to a metal center tube, suspended from a cup-and-cone ball bearing carried by a compact roller bearing overhead carriage, running in the regular "Atchison" truss-shaped steel channel (see detail, our page 10). They roll aside for free opening, but require a ceiling slot and take up 6 to 8 in. of the width and project beyond the wall ends when folded.

NLK wings are locked by ordinary flush bolts to the ceiling only and from inside only, or by mortise bolts to ceiling only with lock cylinders operant from inside or outside.

NLK wings are spread with the same cast cored bar as described for Type NLE, universally hinged at one end and releasibly held at the other, to push and pull out successively under excessive pressure.

16 17 18 19 20

Side-Rolling Type PBK Wings

Type PBK wings are side-rolling but not panic-proof, and take the positions shown above, using for braces the same "latch" drop arm described for Type PB on preceding page.

PBK wings lock in the same way as Type NLK, with plain flush bolts, or with lock-cylinder mortise bolts, to ceiling only.

Type C

These 4-wing doors have wings that take positions shown above (Drawings 1 and 3), and lock by flush ceiling bolts from inside only. They are lowest in cost and have the same revolving value as the much more expensive folding and panic-proof types.

21 22 23 24 25

Drawing 21 shows side-rolling panic-proof type NLK wings folded into one pack and placed aside, using a side floor socket.

Flexed enclosure walls can also be furnished with side-rolling wings, to give maximum free opening if desired (see Drawing 22).

Type PB 3-wing doors have wings to fold aside as shown by dot-line in Drawing 23, and lock to floor and ceiling at one wing only, with flush bolt on other wing. 3-wing doors are useful for narrow entrances with limited traffic, for inside air-lock passages, toilet rooms and for dark rooms. For the latter purpose they are usually made with solid flush wings and double air-lock strips. They are also used for X-ray rooms with lead sheet built into the wings.

Type HC Door Wings

Type HC 3-wing doors (Drawing 24) are a new development for narrow entrances, using four wing enclosures for letting traffic pass in both directions at once, and 3 wings with hinged shoes carrying two air-lock strips for maintaining the air lock. These doors can be made in 4½ to 6 ft. diameters. The 5 ft. sizes have the easy passage of a 6½ ft. door, due to the distance between wings. They will handle traffic at three-quarters the rate of any 4-wing door, in both directions at the same time. Wings may be straight or "curved."

The wings fold into one pack and swing aside as shown in Drawing 25. Braces are a plain hook bar, locking by the folding pivots to floor and ceiling on one wing, and flush bolt on another.

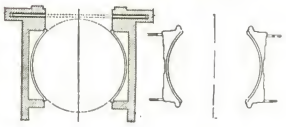
Standard Designs

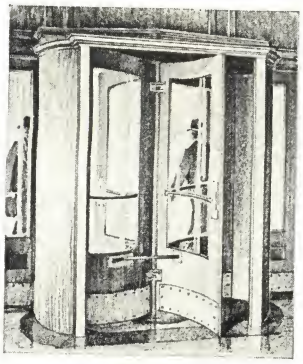
These are shown on opposite page, arranged in schedule form. Horizontal rows show no cornice or a small mold, 6 to 8 in. plain cornice, and 10 to 12-in. projecting cornice, respectively.

Vertical rows show walls unfinished convex or with panel below glass, plain flush convex, paneled convex, or with bent glass respectively. All combinations are shown and numbered and lettered accordingly.

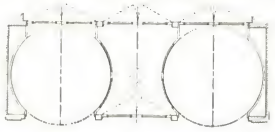
This is the first time that these factors have been so shown, and it is hoped that the schedule of Standard Designs will be found very useful.

Design 1U
Walls—Unfinished Convex.
No Cornice or Roof

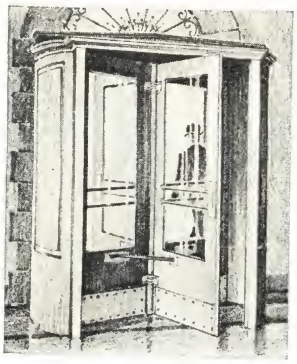




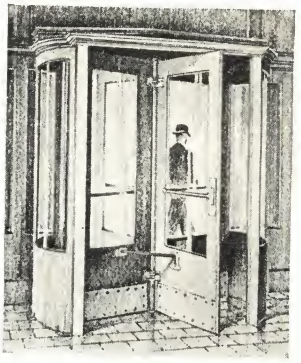
Design 1
Walls—Smooth Convex



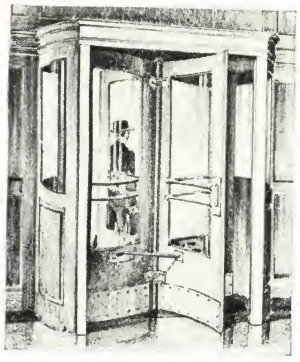
These designs include 3-in. plain cornice, roof, mechanism cover and trap door



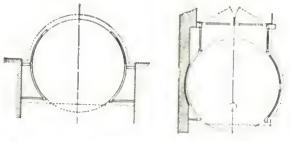
Design 1P
Walls—Paneled Convex



Design 1G
Walls—Bent Plate Glass



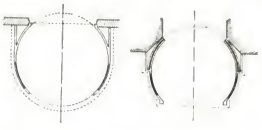
Design 2GP
Walls—Glass with Panel Below

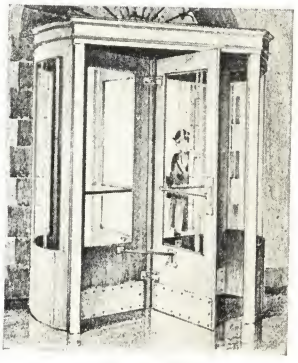


Design 2
Walls—Smooth Convex

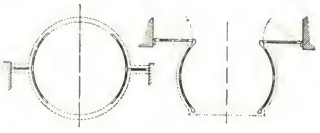
These designs include 6 to 8 in. plain molded cornice, roof and trap door

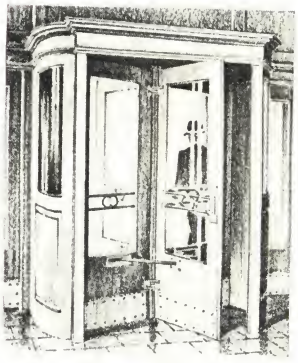
Design 2P
Walls—Paneled Convex



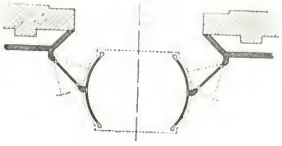


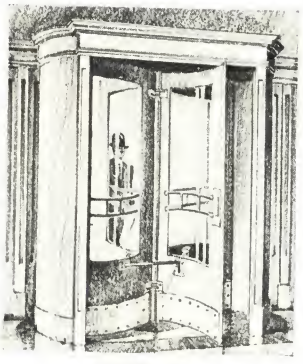
Design 2G
Walls—Bent Plate Glass



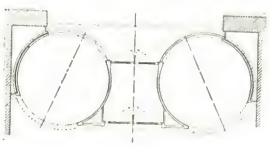


Design 3GP
Walls—Glass with Panel Below

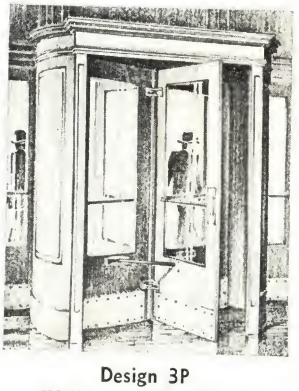




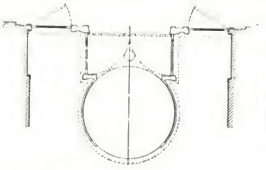
Design 3
Walls—Smooth Convex

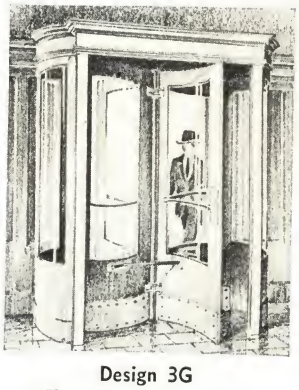


These designs include 10 to 12 in. ornamental cornice, roof and trap door

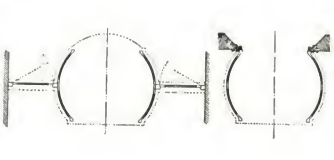


Design 3P
Walls—Paneled Convex





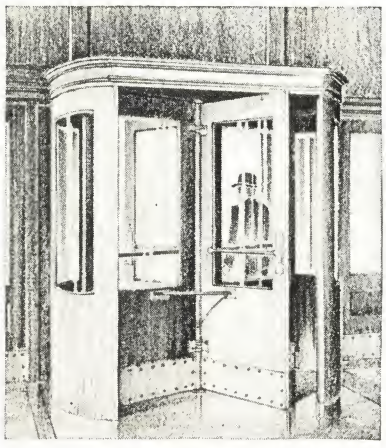
Design 3G
Walls—Bent Plate Glass



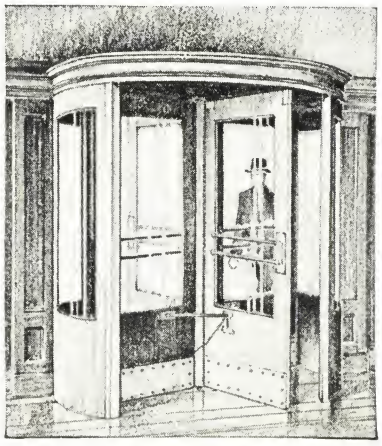
STANDARD DESIGN SCHEDULE

With Suggestive Layouts Applicable to Various Designs

STOCK DOORS

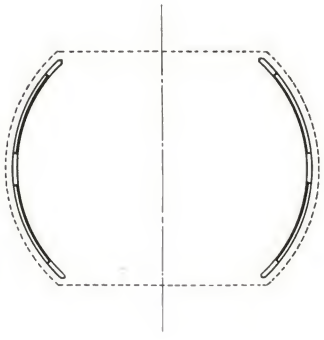


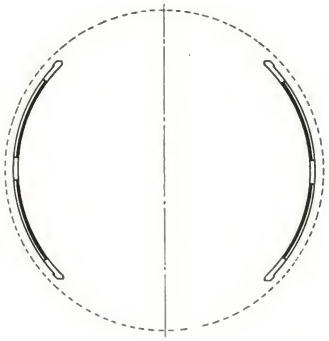
Stock Door No. 9

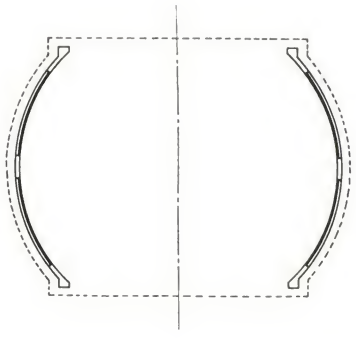


Stock Door No. 8

Stock Door No. 7







Stock Door Styles

Stock Doors are available in three styles as shown.

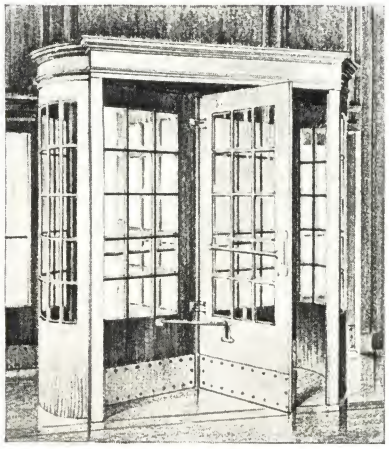
Note: "Curved Wings" are not available in stock doors.

Stock Door No. 9—Is 6 ft. 4 in. by 6 ft. 10 in., gumwood with 3-coat gloss finish to walnut or mahogany sample, drawn plate glass, and wings adapted to be fitted with either NLK or PBK hardware. No. 9 doors are carried in stock ready to ship in walnut finish, Type NLK side-rolling and panic-proof; also in white for finish to sample on about 6 days' notice.

Stock Door No. 8—Is 6 ft. 6 in. by 6 ft. 11 in. with full-round cornice, drawn plate glass, birch with 3-coat gloss finish at prices substantially below No. 7. Wings are shown with PB "latch" drop-arms, but can be fitted with NLE panic-proof hardware at the usual advance.

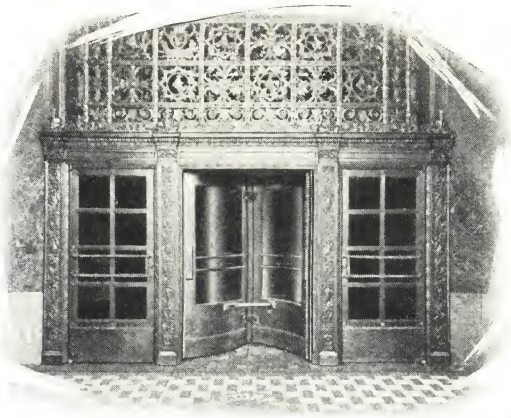
Stock Door No. 7—Is 7 ft. by 7 ft., in birch, mahoganized with 4-coat rubbed finish and polished plate glass. Is similar to Design No. 2 (our page 6) and is made only in small quantities at a moderate saving in cost over specially made standard designs. The drawing shows PB or NLE wings folded aside, but wings are made to be fitted with any type hardware, at the corresponding price.

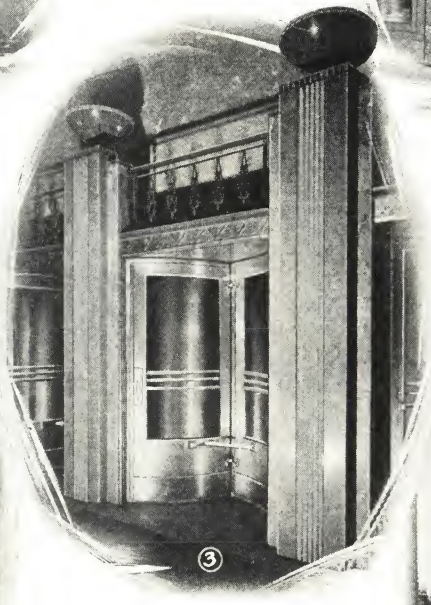
DIVIDED LIGHTS

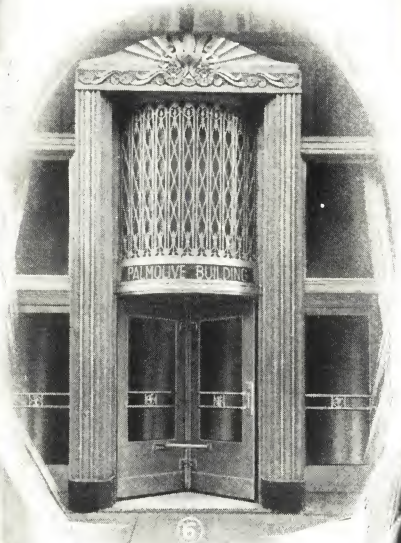


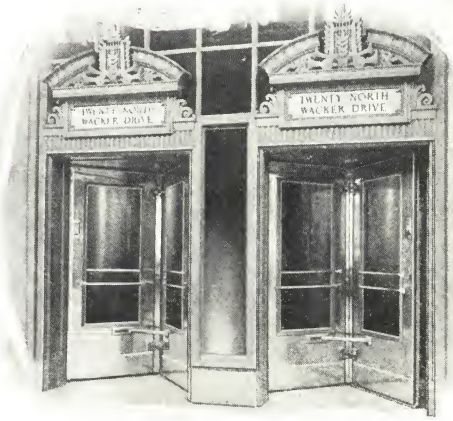
Drawing 3DL

Divided lights in glass openings of wings and walls are shown in Drawing 3DL opposite. These are rather costly in revolving doors, especially in walls where the inner surface of glass is held to the wall radius, but the effect is fine. Divided lights can be furnished in all special and standard designs.



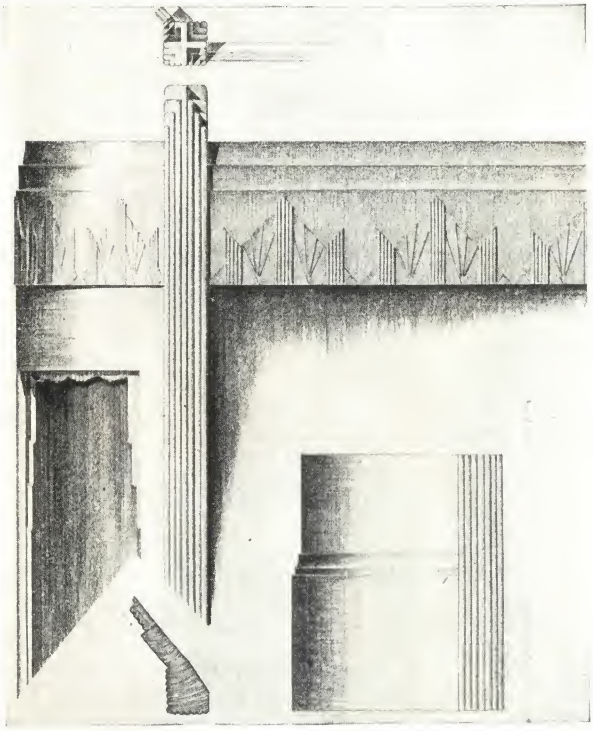




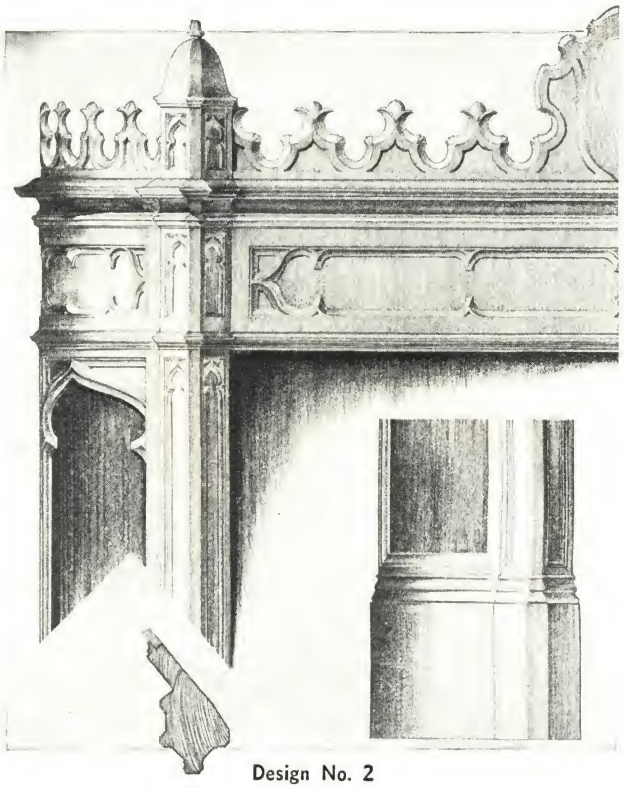


1. Medinah Athletic Club, Chicago, Ill.
2. Merchandise Mart, Chicago, Ill.
3. Abraham & Straus, Brooklyn, N. Y.
4. Schoen & Company, Baltimore, Md.
5. Exchange National Bank, Tulsa, Okla.
6. Palmolive Building, Chicago, Ill.
7. Twenty North Wacker Drive, Chicago, Ill.
8. Carbide and Carbon Building, Chicago, Ill.
9. Union Trust Building, St. Louis, Mo.
10. Union Trust Building, Cleveland, Ohio (One of 13 Doors)

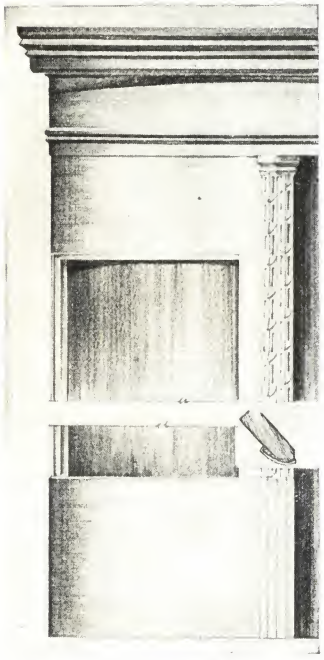
SPECIAL DESIGNS



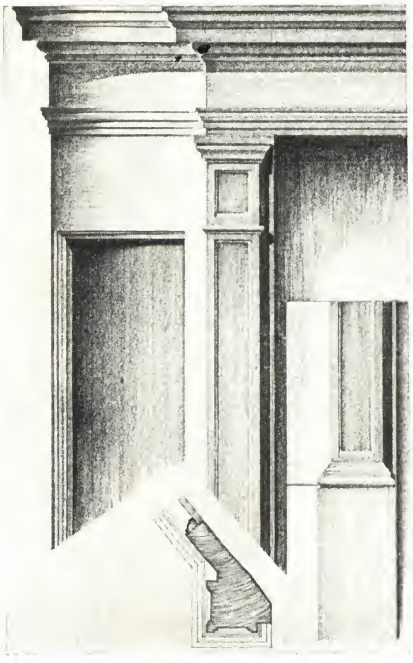
Design No. 1



Design No. 2



Design No. 3



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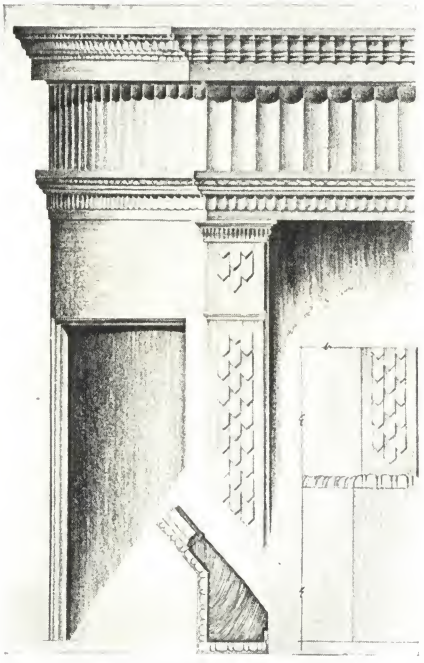
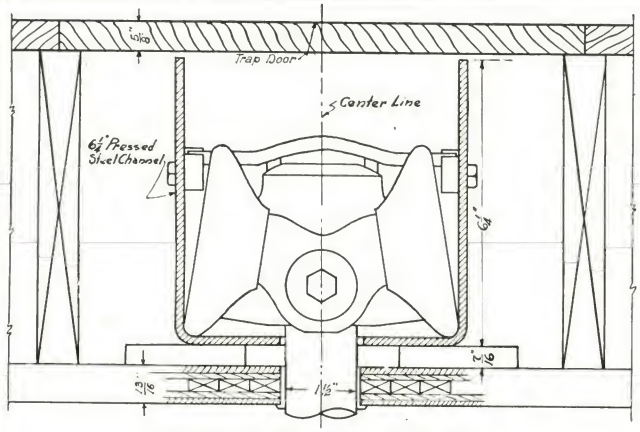


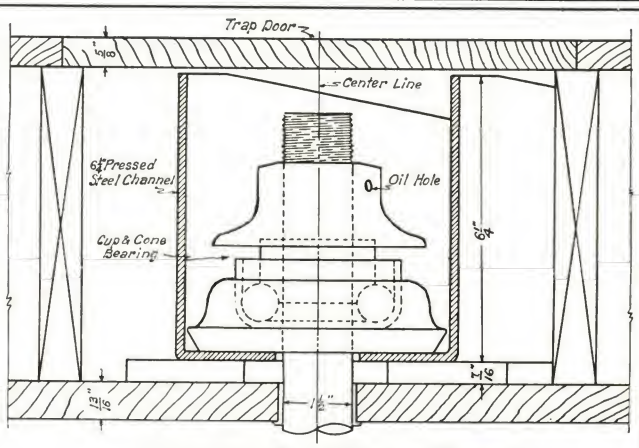
Design No. 5

The special designs shown above are offered both for adoption and as suggestions. Designs Nos. 1, 3 and 5 show economical adaptation of available cut and carved moldings.

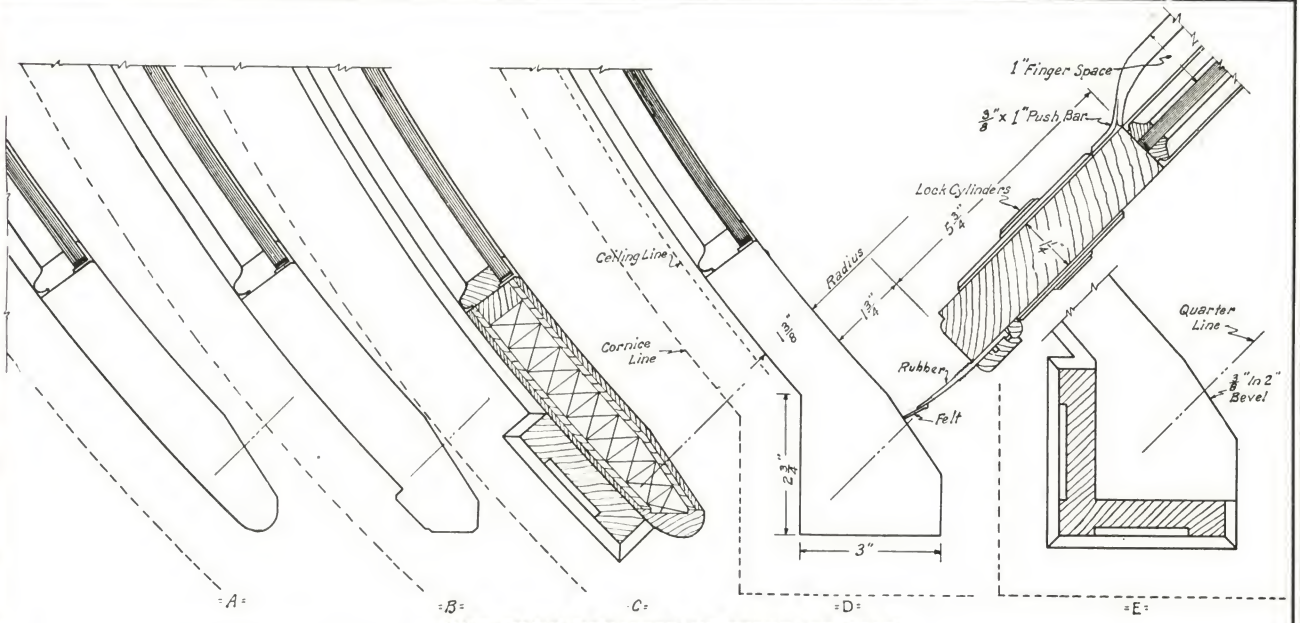
Design No. 2 is a more costly, but more beautiful, example of Gothic design, while Design No. 4 is suitable as a more elaborate but not ornamented door in wood, or is particularly adaptable to metal without requiring cast work.



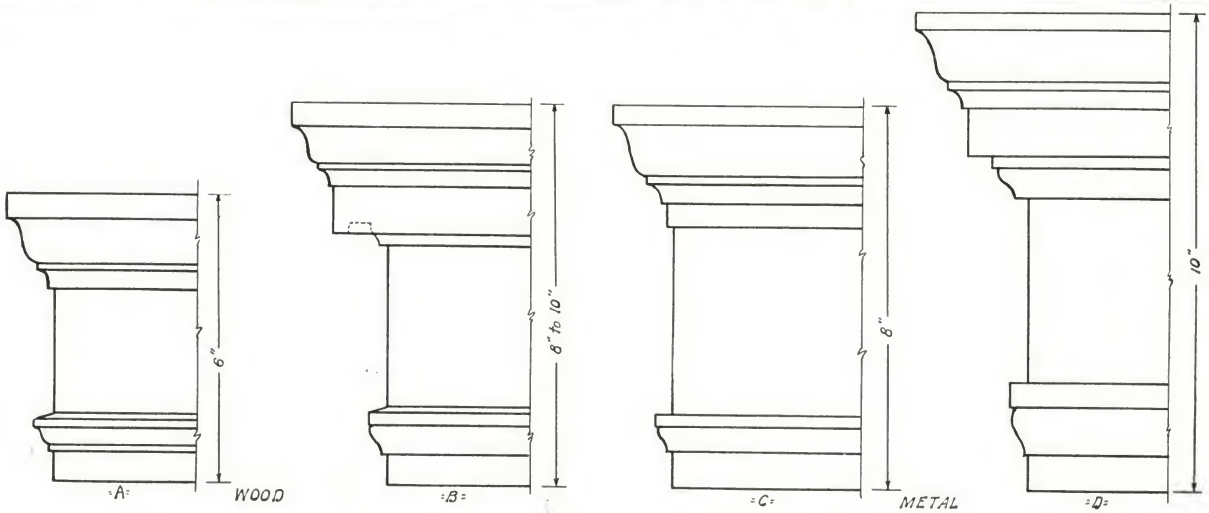
OVERHEAD SUSPENSION TYPE-K
CARRIAGE AND CHANNEL SECTION



FULL-FOLDING TYPES PB AND NLE
STATIONARY BEARING & CHANNEL



WALL ENDS ARRANGED IN ORDER OF COST



STANDARD CORNICE PROFILES RECOMMENDED

ATCHISON REVOLVING DOOR ~ RECOMMENDED DETAILS

SCALE 3" = 1'-0"

REVOLVING DOORS, INC.

TELEPHONE
CHickering 4-1420

542 West 27th Street
NEW YORK, N. Y.

OFFICERS

A. H. BURGESS, President (Pres. Jno. Williams, Inc.)
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Products and Services

REVOLVING DOORS of every description and of any desired material.

Specialists in all Mechanical Devices as applied to Revolving Doors.

Complete installations contracted for anywhere in the United States and Canada.

Automatic Panicproof Revolving Door

Wings are suspended from a universal ball bearing located in a dustproof oil chamber mounted on a carriage running on tracks. The wings can be folded centrally and moved to one side in the usual manner. Each wing is hung to the center post with spring hinges, which hold it under spring control when the braces are detached, preventing slamming of the wings against each other and possible breakage of glass.

The Slip-bar—The braces which hold the wings in rotating position are the vital feature of a panicproof door. This company uses neither cables nor chains, but manufactures the only slip-bar brace that pushes or pulls out under undue pressure. Brace is positive in action, durable, and conforms to building and fire department regulations.

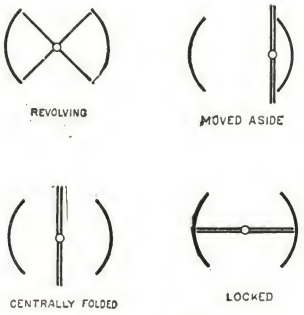
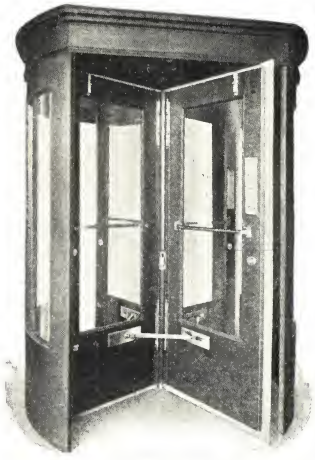


Diagram of Different Positions of Wings



Standard Design No. 106, Panicproof Slip-bar Construction
Adaptable to slight architectural changes. Any material; any wood or hardware finish; kick plates and key locking bolts when desired

Some Recent Installations

The following is a list of some recent installations with the names of the architects and contractors who were connected with the work:

New York, N. Y.

Hotel Waldorf-Astoria, Park and Lexington Avenues, 49th to 50th Streets, Thompson-Starrett Co., Inc., Contractors; Schultze & Weaver, Architects—9 doors

Irving Trust Company, One Wall Street, Marc Eidlitz & Son, Inc., Contractors; Voorhees, Gmelin & Walker, Architects—7 doors

Hotel Pierre, 61st Street and Fifth Avenue, Geo. A. Fuller Co., Contractors; Schultze & Weaver, Architects—3 doors

Western Union Building, Hudson and Worth Streets, Marc Eidlitz & Son, Inc., Contractors; Voorhees, Gmelin & Walker, Architects—6 doors

R. H. Macy & Co., Inc., Broadway and 34th Street, Marc Eidlitz & Son, Inc., Contractors; Robert D. Kohn, Architect—*furnished for Norman-Seton, Inc.*—10 doors

National City Bank *Branches:* 57th Street and Seventh Avenue, 13th Street and Fifth Avenue, 400 Amsterdam Avenue, 167 East 72d Street, Jamaica Avenue and 218th Street, Queens Village

Hotel Pennsylvania Tea Room, West 33d Street, Edward Mulcahy, Contractor; McKim, Mead & White, Architects

Silver House, Corner Pearl and Moore Streets, Cauldwell-Wingate Co., Contractors; Warren & Wetmore, Architects

Brooklyn, N. Y.

Williamsburgh Savings Bank, One Hanson Place

Silvers Lunch Stores, Inc., 571 Fulton Street, B. H. Whinston, Architect—2 doors

Other Localities

Derby Gas & Electric Co., Derby, Conn., Management & Engineering Corp., Architects—*furnished for General Bronze Corp.*

Weehawken Trust & Title Co., Union City, N. J., De Riso Bros., Inc., Contractors; Crow, Lewis & Wick, Architects—2 doors

National Town & Country Club, Cleveland, Ohio—*furnished for Art Metal Construction Co.*

Bendix Brake Building, South Bend, Ind.—*furnished for Ellison Bronze Corp.*

First Mechanics National Bank, Trenton, N. J., York & Sawyer, Architects—*furnished for The W. H. Jackson Co.*—2 doors

Sage, Allen & Co., Hartford, Conn., E. A. Dennison & Associates, Architects—4 doors

New York State National Bank, 75 State Street, Albany, N. Y.—2 doors

Agricultural National Bank, 100 North Street, Pittsfield, Mass., D. Herbert Pike, Contractor; Halsey, McCormack & Helmer, Architects

One of Ten Revolving Doors, Empire State Building, New York, N. Y.
SHREVE, LAMB & HARMON, Architects
STARRETT BROS. & EKEN, Contractors
Installed for General Bronze Corporation

VAN KANNEL REVOLVING DOOR CO.

TELEPHONES
LUdlow 4-6350 to 6354

716 Whitlock Avenue, NEW YORK, N. Y.

ESTABLISHED 1889

REPRESENTATIVES

ATLANTA, GA., 666 Greenwood Ave., N. E.
BALTIMORE, MD., 509 No. Charles St.
BIRMINGHAM, ALA., 2028 6th Ave. No.
BOSTON, MASS., 1042 Little Bldg.
BUFFALO, N. Y., 519 Jackson Bldg.
BUTTE, MONT., 51 East Broadway
CANTON, OHIO, 715 Short Ave., P. O. Box 314
CEDAR RAPIDS, IOWA, 902 Security Bldg.
CHATTANOOGA, TENN., 821 East 11th St.
CHICAGO, ILL., 1529 Tribune Tower Bldg.
CINCINNATI, OHIO, 209-11 East 6th St.
CLEVELAND, OHIO, 9105 Woodland Ave.
COLUMBIA, S. C., 1420 Elmwood Ave.
COLUMBUS, OHIO, 1535 Menlo Place
DALLAS, TEX., P. O. Box 447
DAYTON, OHIO, 494 Ludlow Arcade
DENVER, COLO., 812 Twelfth St.
DES MOINES, IOWA, 1418 34th St.
DETROIT, MICH., 400 U. S. Mortgage Bldg.
DUBUQUE, IOWA, 907 Federal Bank Bldg.
EL PASO, TEX., Neff Stiles Co.
ERIE, PA., 405 Scott Block
EVANSVILLE, IND., 1321 Edgar St.
FARGO, N. D., 217 Broadway
FORT WAYNE, IND., Taylor St. and Lake Erie Railway
HARRISBURG, PA., 18th and Mulberry Sts.
INDIANAPOLIS, IND., 115 E. Vermont St.
JACKSONVILLE, FLA., 1450 W. Beaver St.
KANSAS CITY, MO., 4884 Main St.
KNOXVILLE, TENN., 712 So. Gay St.
LIMA, OHIO, 410 Opera House Block
LOS ANGELES, CAL., 408 So. Spring St.
LOUISVILLE, KY., 1446-48 Levering St.
MEMPHIS, TENN., 248 Madison Ave.
NASHVILLE, TENN., 63 Arcade Bldg.
NEW ORLEANS, LA., 319 Dryades St.
NORFOLK, VA., 235 Monticello Arcade Bldg.
OMAHA, NEB., 1914 Vinton St.
PHILADELPHIA, PA., 1600 Walnut St.
PHOENIX, ARIZ., P. O. Box 145
PITTSBURGH, PA., 1052 Century Bldg.
PORTLAND, ME., 31½ Exchange St.
PORTLAND, ORE., 61-67 Albina Ave.
RICHMOND, VA., 202 Davis Bldg.
ROANOKE, VA., 507 Commerce St.
ROCHESTER, N. Y., 135 Spring St.
ST. LOUIS, MO., 927-8 Century Bldg.
ST. PAUL, MINN., 2694 University Ave.
SALT LAKE CITY, UTAH, 204 Dooly Bldg.
SAN FRANCISCO, CAL., 55 New Montgomery St.
SCHENECTADY, N. Y., 110 Wall St.
SEATTLE, WASH., 216-17 Walker Bldg.
SHREVEPORT, LA., 310 Ricou-Brewster Bldg.
SIOUX FALLS, S. D., 213 Paulton Bldg.
SYRACUSE, N. Y., 938 University Block
TERRE HAUTE, IND., 125 So. 7th St.
TOKIO, JAPAN, Marunouchi
TULSA, OKLA., 621 W. 8th St.
WASHINGTON, D. C., 1427 Eye St., N. W.
WILKES-BARRE, PA., Miners Bank Bldg.
WINNIPEG, CAN., 120 Lombard St.

AGENTS FOR JAPAN AND KOREA: Uchida Trading Co., Ltd., 11 Park Place, NEW YORK, N. Y.

AGENTS FOR CHINA: Paul I. Fagan & Co., 433 California Ave., San Francisco, Cal., and 29 Kiangse Road, P. O. Box 592, SHANGHAI, CHINA

Products

VAN KANNEL REVOLVING DOORS (3-Wing and 4-Wing styles) in three distinct types:

Automatic Collapsible Panic Proof—Type "J-C," Type "A" and Type "A-A."

Semi-collapsible—Type "B."

Also Van Kannel Revolving Pantry Windows (all products patented).

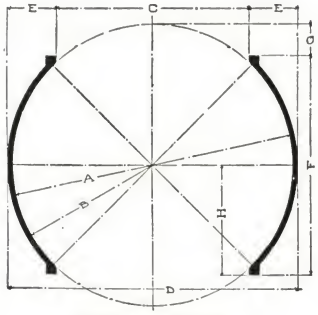
Original Patentee

This company is the pioneer manufacturer and original patentee of revolving doors; its patents cover every practical improvement and substantial feature.

Van Kannel Revolving Doors

Van Kannel Revolving Doors are usually furnished complete with circular enclosures, ceiling and cornice, wings and all hardware.

Materials—Materials used for entire construction are any kind of hardwood, bronze or steel on a metal frame or wood core covered with various gages of metals in either copper, steel or bronze, using the following gages—Nos. 24, 20, 16. Revolving door vestibules may be made of other materials such as marble, tile or cement, as may be needed in order to carry out architectural treatments.



Dimension Diagram

Stock Designs—Several stock designs are carried on hand in gum, plain oak, and birch, for oak, mahogany, walnut or lacquer bronze finishes. See stock series and stock special doors as illustrated.

Automatic Collapsible, Panic Proof Type—This type of door has 3 or 4 wings hung independently of each other on metal discs attached to the center shaft. The wings are normally held in a radial position by flexible cables (see Type "J-C" and Type "A") or by spring sockets in the heavy metal discs. (See Type "A-A"). This type of door gives absolute safety at all times, and under all conditions. The safety feature lies in the fact that the engagement of the cables and sockets is such that on application of pressure on the wings, slightly more than necessary to revolve the door, the revolving wings will instantly and automatically collapse and fold outward in the line of egress, leaving a free, unobstructed passageway. A manual release for the cables and spring sockets is provided to facilitate folding the wings when desired.

Semi-collapsible—This type made with three or four wings, held in radial position by cables engaged in positive sockets. The wings are collapsed by means of a convenient trigger which releases the cables, when it is desired to have the wings folded in the middle or pushed to one side for a wide open passageway. This type, although collapsible as to folding of the wings, is not automatically so, as in the case of the automatic collapsible panic proof door previously described.

3-Wing Revolving Door

3-Wing Revolving Door—The 3-wing revolving door is especially adapted for entrances that are too small to accommodate a 4-wing door at least 6 ft. in diameter. It is being used to a great extent in entrances to toilet rooms in schools, institutions and public buildings and the company has installed 34 of these doors for the Prudential Building, Newark, N. J. Approximately 5-ft. diameter.

TABLE OF DIMENSIONS—FT.-IN.

A	B	C	D	E	F	G	H
5-10	2-11	3-11½	6-1	1-0¾	4- 7¼	7⅜	2- 3⅝
6- 0	3- 0	4- 1	6-3	1-1	4- 8½	7¾	2- 4¼
6- 2	3- 1	4- 2½	6-5	1-1¼	4-10	8	2- 5
6- 4	3- 2	4- 4	6-7	1-1½	4-10	9	2- 5
6- 6	3- 3	4- 5¼	6-9	1-1⅞	5- 0¾	8⅝	2- 6⅜
6-10	3- 5	4- 8	7-1	1-2½	5- 3½	9¼	2- 7¾
7- 0	3- 6	4- 9½	7-3	1-2¾	5- 5	9½	2- 8½
7- 2	3- 7	4-10¾	7-5	1-3⅛	5- 6½	9¾	2- 9¼
7- 6	3- 9	5- 1½	7-9	1-3¾	5- 9¼	10⅜	2-10⅝
7-10	3-11	5- 4¼	8-1	1-4⅜	6- 0	11	3- 0
8- 0	4- 0	5- 5¾	8-3	1-4⅝	6- 1½	11¼	3- 0¾

DESCRIPTIVE DATA

Panic Proof Type Wings—Thickness, 1¼ in., wood; 1 to 1¼ in., metal.

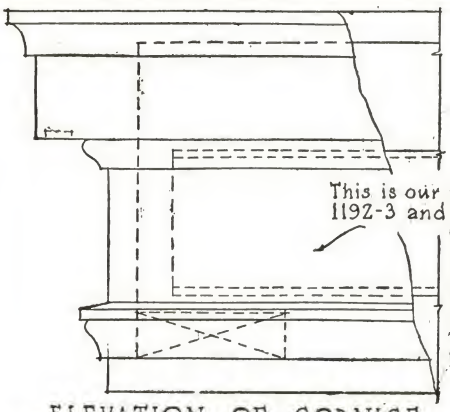
Semi-Collapsible Wings—Thickness, 1¼ in., wood.

Door Vestibules—4 ft. 8 in. to 6 ft. diam., 3 wings; 6 ft. to 8 ft. diam., 4 wings.

Normal Diameter Vestibule—7 ft. Stock Design Vestibule Diameter, 6 ft. 4 in.

Traffic Adapters

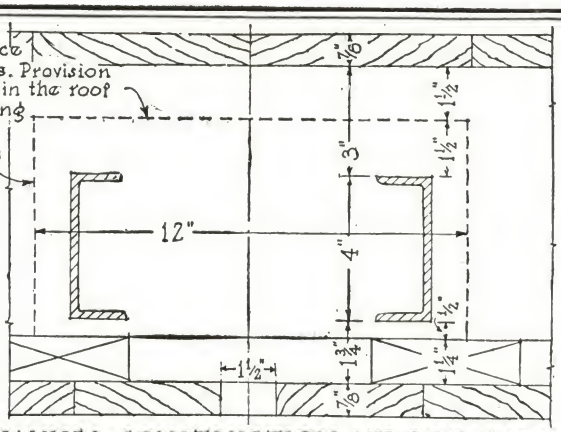
Two types—Electrical and Mercury Traffic Adapters, applicable to any style of Van Kannel Revolving Door, new or old, permit the regulation of the revolving door at any desired maximum speed. They are simple, dependable, and easily installed at a nominal cost.



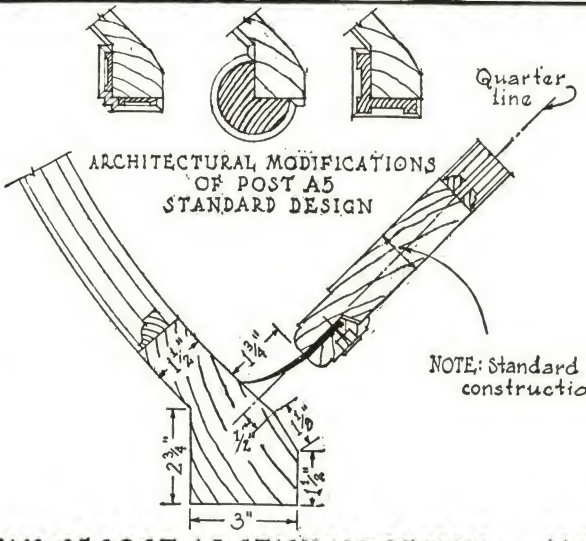
This is our high stock cornice, 1192-3 and 1192-4 designs. Our 1192-1 and 1192-2 designs have low cornice, 2¼" to 3" high, necessitating a channel box covering to protect overhead trolley mechanism.

ELEVATION OF CORNICE SCALE 3/16"=1"

Dotted line shows space required for all types. Provision can be made, either in the roof or a trap in the ceiling to take care of our overhead mechanism



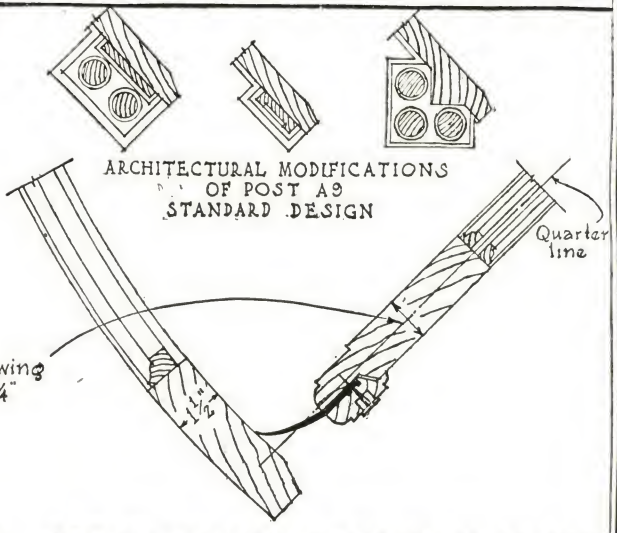
CHANNEL CONSTRUCTION AND LOCATION



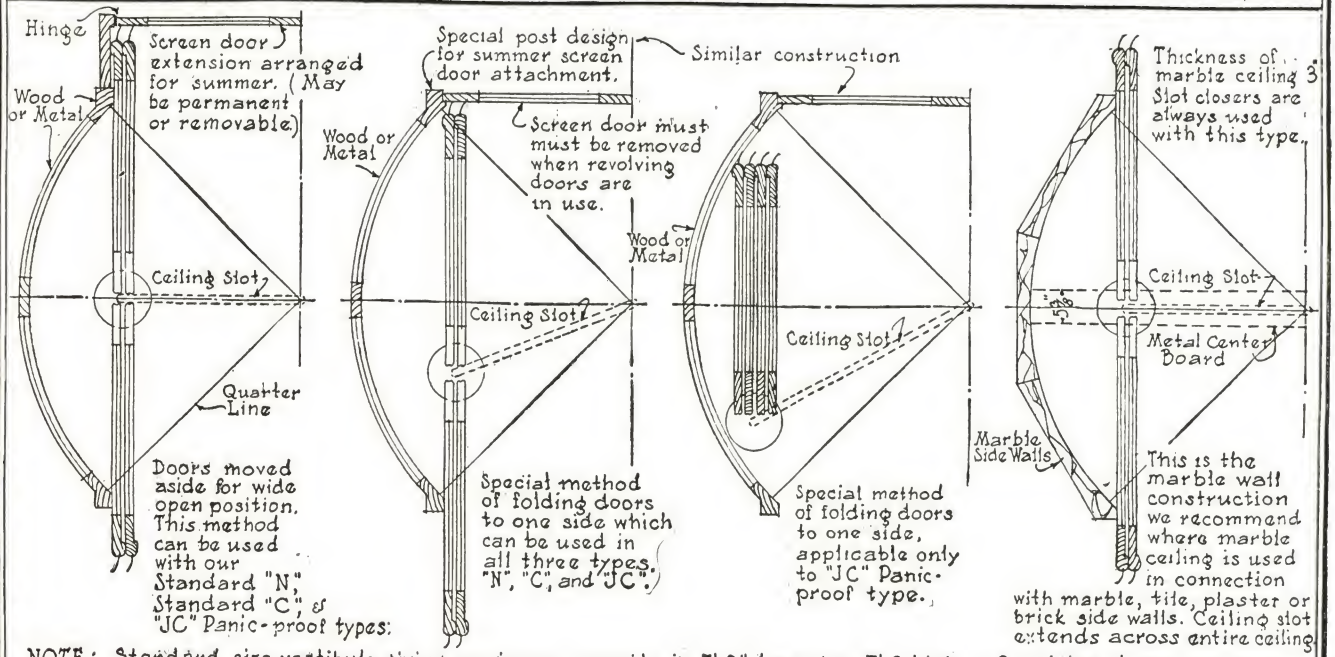
ARCHITECTURAL MODIFICATIONS OF POST A5 STANDARD DESIGN

NOTE: Standard type wing construction – 1¼"

ARCHITECTURAL MODIFICATIONS OF POST A9 STANDARD DESIGN



DETAIL OF POST A5 STANDARD DESIGN SCALE 3/16"=1" DETAIL OF POST A9 STANDARD DESIGN



NOTE: Standard size vestibule giving maximum capacity is 7'-0" diameter, 7'-0 high. Revolving doors are made in 3-wing and 4-wing types. The 3-wing type vestibule ranges from 4'-8" to 6'-0" diameter, and the 4-wing type ranges from 6'-0" to 8'-0" diameter. Normal diameter 7'-0". We also make 6-wing type doors, but do not advocate their use.

VARIOUS TYPES OF VESTIBULE CONSTRUCTION TO PERMIT CONVENIENT FOLDING OF WINGS

CONSTRUCTION DETAILS OF THE VAN KANNEL REVOLVING DOOR.

Illustration No. 1
Type J-C Automatic Collapsible
Standard design 1192-1. Material, any metal or wood.
Design 1192-1-U. Vestibule finished inside only.
Design 1192-2. Vestibule with glass panels

Illustration No. 3
Type J-C Automatic Collapsible
Standard design 8. Material, birch; size 6 ft. 6 in. x 6 ft. 11 in.

Illustration No. 5
Stock Type A Automatic Collapsible
Standard design No. 9. Material, gumwood or oak. Finish, bronze lacquer, oak, mahogany or walnut; size 6 ft. 4 in. x 6 ft. 10 in.

STANDARD DESIGNS

Specifications for Standard Equipment

The revolving door contract to include the revolving wings, circular walls, ceiling and cornice, together with all necessary mechanism, hardware, push bars, push plates, key locks and kick plates. All glass, either bent or flat, to be best selected American plate.

Type J-C, Illustrations Nos. 1 and 2—Furnish and install where shown on plans, revolving doors of the VAN KANNEL REVOLVING DOOR Co. make, Design [1192-1] [1192-2] [1192-3] [1192-4] (see illustrations 1 and 2) Automatic Collapsible. Material: (if wood) the kind selected to match surrounding trim; (if metal) either kalamein plate on wood core construction or hollow metal.

Standard Design No. 8, Illustration No. 3—Furnish and install where shown on plans, revolving doors of the VAN KANNEL REVOLVING DOOR Co. make, Standard Design No. 8, Automatic Collapsible Panic Proof mechanism. Woodwork to be birch. Finish to match surrounding trim.

Standard Design No. 7, Illustration No. 4—Furnish and install where shown on plans, revolving doors of the VAN KANNEL REVOLVING DOOR Co. make, Standard Design No. 7, Automatic Collapsible Panic Proof mechanism. Woodwork to be birch. Finish to match surrounding trim.

Stock Design No. 9, Type "A," Illustration No. 5—Furnish and install where shown on plans, revolving doors of the VAN KANNEL REVOLVING DOOR Co. make, Standard Design No. 9 with Type "A" Automatic Collapsible Panic Proof hardware. Woodwork to be gumwood. Finish: [lacquer] [walnut] or [mahogany], or to be oak. Finish: [oak]. Finish to match surrounding trim at slight extra charge.

Stock Design No. 9, Type "B," Illustration No. 6—Furnish and install where shown on plans, revolving doors of the VAN KANNEL REVOLVING DOOR Co. make, Standard Design No. 9 with Type "B" Semi-Collapsible hardware. Woodwork to be gumwood. Finish: [lacquer] [walnut] or [mahogany] or to be oak. Finish: [oak]. Finish to match surrounding trim at slight extra charge.

Positions Assumed by Wings

Note on following page position assumed by wings of various types here shown.

Automatic Burglar Lock

Van Kannel Revolving Doors may be furnished with an automatic electrically controlled burglar lock which may be actuated by any number of push-buttons located in any part of the building. Closing the circuit insures instantaneous locking of the door.

Illustration No. 2
Type J-C Automatic Collapsible
Standard design 1192-4. Material, any metal or wood.
Design 1192-3. Vestibule solid walls

Illustration No. 4
Type J-C Automatic Collapsible
Standard design 7. Material, birch; size 7 ft. x 7 ft.

Illustration No. 6
Stock Type B Semi-collapsible
Standard design No. 9. Material, gumwood or oak. Finish, bronze lacquer, oak, mahogany or walnut; size 6 ft. 4 in. x 6 ft. 10 in.

Type "A-A" Automatic Collapsible Panic Proof Revolving Door Without Cables or Braces

The wings of this revolving door are mounted on exceptionally heavy metal discs and ample hangers which reinforce the wings. The hangers and discs contain heavy spring sockets which hold the wings in radial position for normal operation. Any pressure on the wings in excess of that needed to rotate the door will release the sockets and allow the wings to collapse and fold flat, permitting unobstructed egress. This revolving door does not have any cables or braces between the wings.

For easy operation when the wings are to be folded or moved to one side, a simple manual release for the socket (see arrow handle) is provided. When in released position, the wings swing freely for folding in any position.

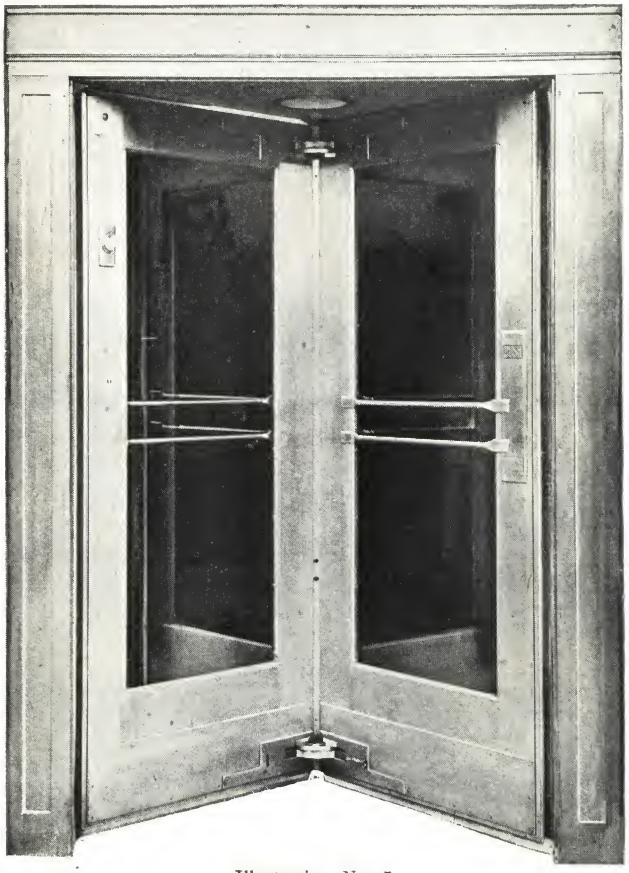


Illustration No. 7
Type "A-A" Automatic Collapsible Panic Proof
Furnished in any design as shown on previous page. Material, any metal or wood. Automatic collapsible door without cables, simple manual release permits easy folding

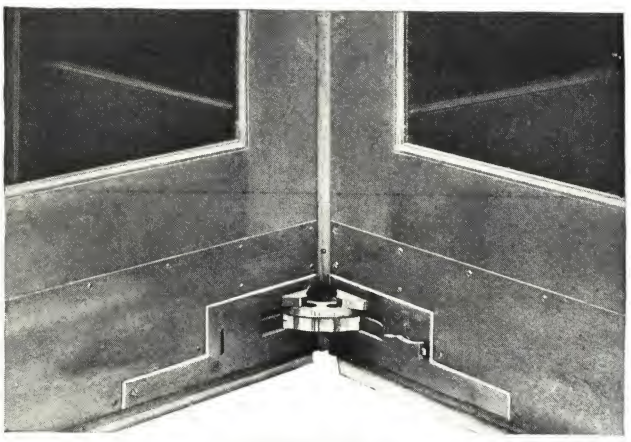


Illustration No. 8
Enlarged View of Self-bracing Hangers
No cables used to hold wings. Note arrow cams for releasing socket for easy manual operation

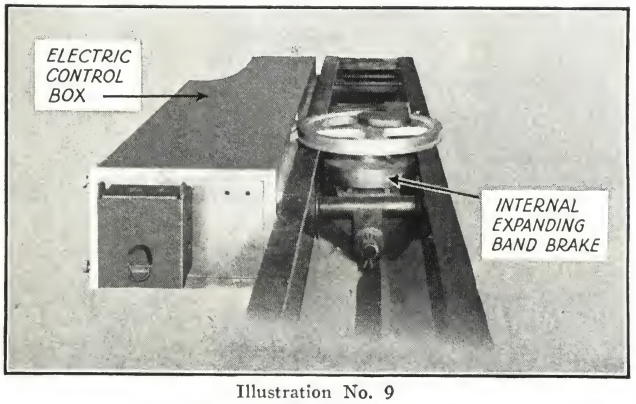


Illustration No. 9
Electrical Traffic Adapter
For regulating speed of Revolving Door

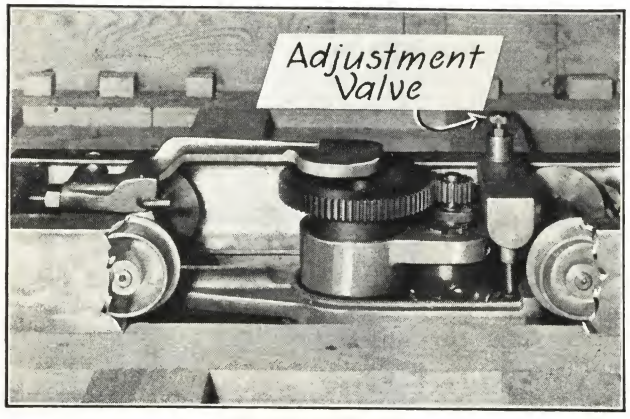


Illustration No. 10
Mercury Traffic Adapter
For regulating speed of Revolving Door

Electrical Traffic Adapter

Can be applied to any Van Kannel Revolving Door, old or new. Can be adjusted to restrict speed of rotation to any desired maximum. Does not affect operation of door at normal speeds, but prohibits spinning or excessive speed.

Mercury Traffic Adapter

Can be applied to any Van Kannel Door, old or new. Does not affect operation of door at normal speed. Adjustment permits limiting speed at any desired maximum. Will prevent spinning or excessive speed. Simple, dependable, and easily installed at nominal cost.

Position Assumed by Wings

Illustrations below are for the purpose of showing positions assumed by wings and do not illustrate "Stock Designs." Key to positions assumed by wings, referring to designs illustrated on preceding page is tabulated at the bottom of this page.

Architectural Literature

Check your files to see that you have the following important Architectural Literature:

Second Edition Manual of Revolving Door Construction and Architectural Design—twenty-four pages; and eight-page Specification Folder.

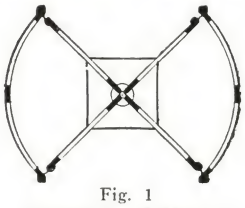


Fig. 1

REVOLVING POSITION

Four wings extended, permitting persons to pass in and out, at the same time excluding noise, rain and snow, heat and cold, wind and dust

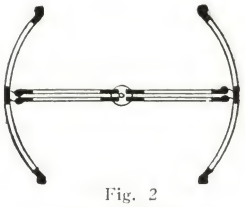


Fig. 2

LOCKED POSITION

Four wings folded in pairs and placed across vestibule, securely locked or bolted. Lock operates from both sides

Fig. 3

CENTRAL OPEN POSITION

Wings folded flat in pairs and held in position by folding bars, making two passages separating traffic

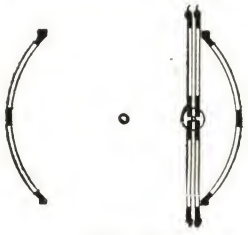


Fig. 4

FULL OPEN POSITION

Wings folded and moved aside, making available full width of entrance

Fig. 5

PANIC COLLAPSED POSITION

Wings folded on each other in outward position, dividing traffic into two streams

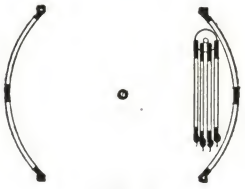
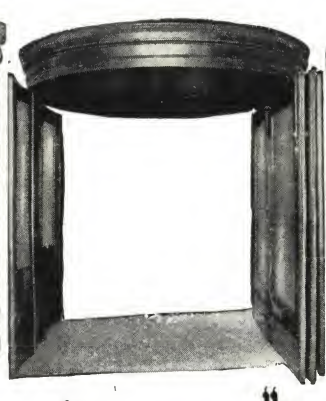


Fig. 6

FULL OPEN POSITION WITH WINGS COLLAPSED

Wings folded on each other and moved to one side making available full width of entrance



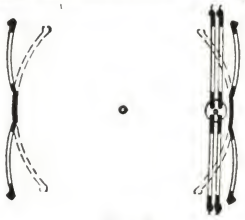
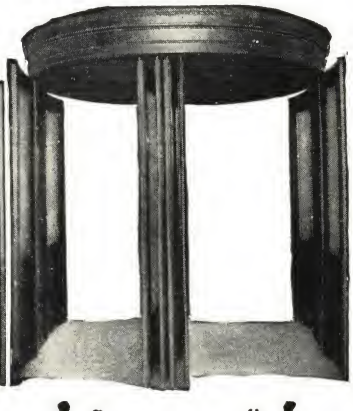


Fig. 7

FULL OPEN POSITION WITH FLEXED WALLS

Wings folded and moved aside with hinged walls flexed for added space



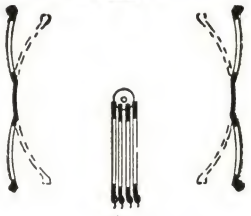


Fig. 8

PANIC COLLAPSED POSITION WITH FLEXED WALLS

Wings folded on each other in outward position with walls flexed for added space

Positions Assumed by Wings—All Types of Doors

AUTOMATIC COLLAPSIBLE PANIC PROOF TYPES—Positions 1, 2, 3, 4, and 5 assumed by wings. Type J-C, Type "A-A," Standard Design No. 7, Standard Design No. 8, Stock Design No. 9 with Type "A" hardware.

SEMI-COLLAPSIBLE TYPE—Positions 1, 2, 3, and 4 assumed by wings. Stock Design No. 9, with Type "B" hardware.

Note A—Special trolley can be furnished which will permit wings to assume position shown in Fig. 6.

Flexed Walls—In order to provide added entrance space where desired, flexed wall construction can be furnished which will permit wings to assume positions shown in Figs. 7 and 8.

ESTABLISHED 1846

CORNELL IRON WORKS, INC.

Steel Rolling Shutters and Doors; Underwriters' Labeled Fire Doors and Shutters Hand and Automatic Operation, Steel, Rustless Steel, Bronze, Aluminum or Zinc Slats

TELEPHONE
STillwell 4-3880—3881
3882—3883

3610 to 3630 13th Street
LONG ISLAND CITY, N. Y.

For Local Representatives in Principal Cities, Consult Telephone Book or Write Home Office for Address

Products

CORNELL IMPROVED DEEP ARCH INTERLOCKING SLAT STEEL ROLLING DOORS and SHUTTERS, handle, chain, crank, or motor operated, for wharves, piers, terminals, warehouses; freight platforms, elevator shafts, garages, store fronts, craneway openings, office buildings, interbuilding communicating doors, residences, hospitals, schools, power plants and a host of industrial and factory buildings.

Send for 32-page catalogue, with complete dimensions, specifications and other constructive information.

Location

Cornell doors are manufactured in Greater New York in a modern one-story factory.

Unsurpassed shipping facilities by all railroads, as well as water routes to all points on the east, south and west coasts, the Great Lakes and all foreign points.

Since 1846

CORNELL IRON WORKS, INC., is the oldest rolling door manufacturer in the United States. Cornell Doors have been in use for well over half a century. Our later types embody many modern improvements and exclusive features.

Description

Cornell Steel Rolling Doors are designed for the closure of all types of openings. They offer fire, burglar and weather protection, combined with neat appearance and economy of space.

The curtains (see below) run in vertical side guides and coil around a horizontal shaft above the opening.

The weight of the curtain is counterbalanced by springs in the shaft, which permit it to remain stationary in any position.

Cornell Steel Rolling Doors are also furnished with exclusive non-corroding curtain bottoms. Entire non-corroding curtains of bronze, aluminum, rustless steel or zinc carry only a reasonable extra cost.

The question of size offers no problem. Cornell Rolling Doors and Shutters are made up to 45 ft. in width and 100 ft. in height and are constructed to meet most unusual requirements.

Underwriters' Label

Cornell (Llenroc) Rolling Fire Doors have been thoroughly tested by, and made to meet the standards of, the Underwriters' Laboratories, Inc., Chicago, Ill. Each door carries their label. They are also approved by the Factory Mutual Laboratories.

Fusible links control the doors to make certain automatic closing at 150° Fahr.

Cornell labeled doors operate easily, for normal service, independently of the automatic devices. They are not difficult to operate after they have closed automatically.

The Following Features Are Notable—A powerful starting force, acting immediately upon the parting of the fusible link and diminishing as the door descends.

An automatic braking action to prevent a jarring closure, with an additional governor where required.

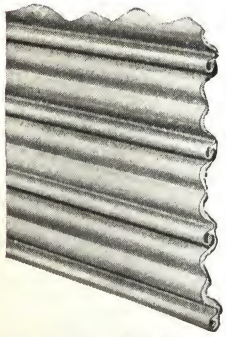
Non-corrodible rolling contacts for the automatic release.

Non-corrodible, self-lubricating bearings throughout.

Thirty designs of Cornell Labeled Fire Doors include: fire wall doors, Class "A"; vertical shaft doors, Class "B"; corridor doors, Class "C"; and exterior doors and shutters, Class "D."

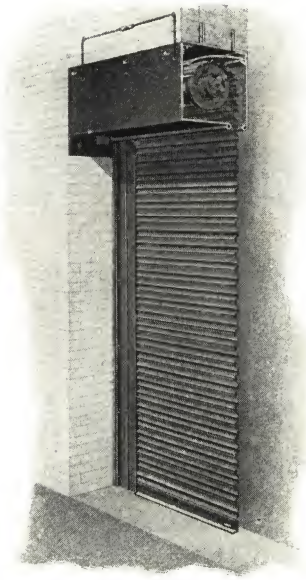
Take Minimum Space

Cornell Rolling Doors take the minimum of room. They are all-steel and will last as long as the building. They operate with surprising ease in the largest sizes. They are easily repaired, after accident, with a few new slats quickly inserted.



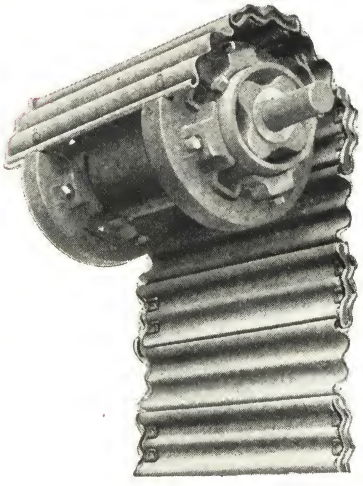
Interlocking Slat Curtain (Front View)

End locks removed. Note strength and appearance



Cornell Type 101A, Single, Labeled Fire Door Operating Between the Jambs

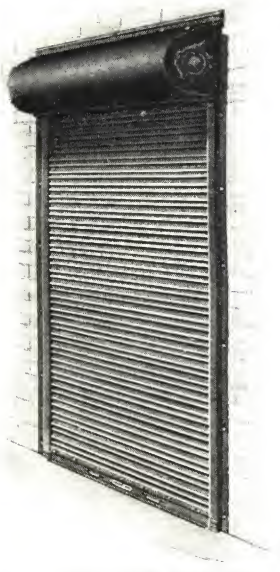
Coils under the lintel in an existing opening. Note fuse link, hinged baffle plate which drops on the curtain top in case of fire



At Left:

End View of Shaft and Curtain

Note the malleable iron end locks with double riveted lips and the deep arch of slats



Type SCF Self-coiling Shutter or Door

Abbreviation for self-coiling operation, face of wall location. Standard up to 80 sq. ft. Can be operated from either side by handles. Pole furnished gratis where required with doors over 7 ft. high

Solid Bronze Curtain Rolling Door

One of the handsomest doors. Serves the double purpose of fine appearance and non-corroding quality. The additional cost is very reasonable

Operation

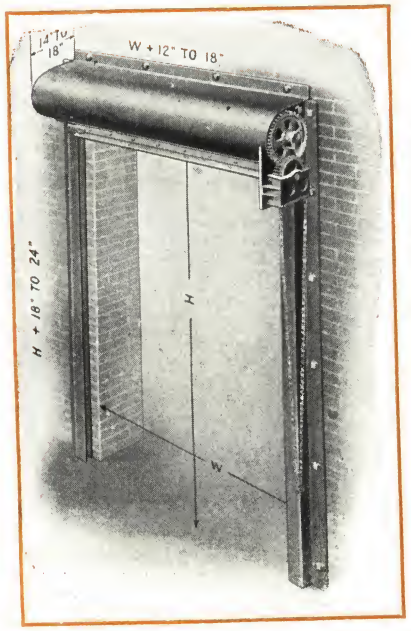
There are four typical methods of operation:

Self-coiling Type—Standard for openings up to 80 sq. ft. and below 8 ft. in height. Push up and pull down by handles on the bottom bar. The quickest acting construction possible.

Hand Chain and Gearing Type—Standard for larger openings. Shaft revolved by endless hand chain, acting through single or compound gearing on an overhead gear bracket.

Motor Drive Type—Standard for the largest openings.

Underwriters' Label Automatic Closing Type—Controlled by fusible links. Tested and listed—perfect, certain operation.



Cornell Improved Interlocking Steel Slat Curtains

Designed to give unusual rigidity against wind pressure, having a depth at the crown of ⅞ in. The appearance is attractive from either side, as the curtain is made up of a series of cold rolled copper bearing steel mouldings with deep relief. The end locks are malleable iron designed for maximum wear and strength. Furnished in U. S. gauges from No. 16 to 22, cold rolled and galvanized.

Left:

Type CGF Chain and Gear Door

Standard door for openings over 80 sq. ft. Note typical dimensions

Below:

Class 1A, 2A, 3A Label (Llenroc) Fire Door

A popular automatic fire door. More in use than any of our other types. Push up, self-coiling type. Note the fuse link. Labeled by Underwriters' Laboratories, Inc.

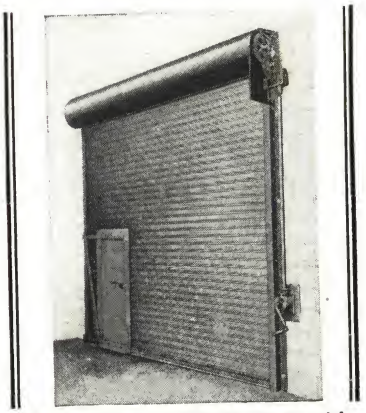
Llenroc (Cornell spelled backwards) denotes automatic doors labeled by Underwriters' Laboratories, Inc.

Cornell Non-corroding Curtains

Of cold rolled bronze, aluminum, rustless steel or zinc interlocking slats. An original Cornell product. Require no painting. Of great service in resisting coal gas, acid fumes, severe salt water exposure, etc. Give a handsome finish at comparatively small extra cost.

Cornell Exclusive Non-corroding Curtain Bottoms

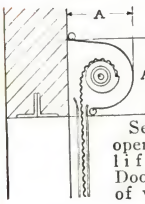
Experience proves that all exposed doors and shutters of steel corrode fastest at the bottom. To neutralize this, CORNELL IRON WORKS, INC., has originated the feature of using 12 to 18 ins. of bronze or rustless steel bottom slats for exposed doors. The extra cost is small and the life of the installation may often be more than doubled by this method.



Type HCF Hand Crank Door with Wicket

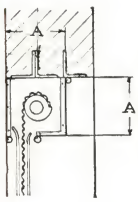
Hand crank operation, face of wall location. Note small wicket door, frame of which swings out when the rolling door is coiled

TYPES OF CORNELL COMMERCIAL SERVICE ROLLING DOORS



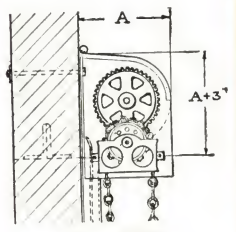
Type SCF

Self-coiling operation with lift handles. Door on face of wall



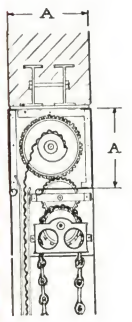
Type SCB

Self-coiling operation. Door between jambs



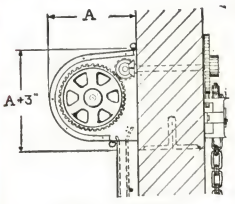
Type CGF

Chain and gear operation. Door on face of wall



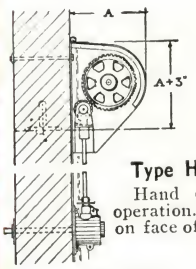
Type CGB

Chain and gear operation. Door between jambs



Type CGTF

Chain and gear operation, through wall. Door on outside

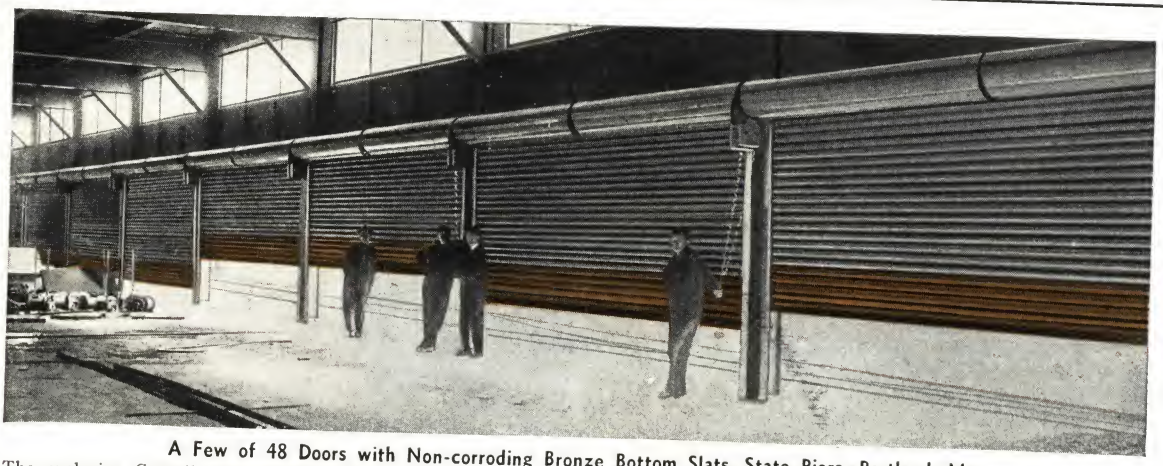


Type HCF

Hand crank operation. Door on face of wall

All Types

A = 14 ins. up to 7 ft. opening height. Add 1 in. for each 3 ft. of additional height



A Few of 48 Doors with Non-corroding Bronze Bottom Slats, State Piers, Portland, Me.

The exclusive Cornell Non-corroding Bottom Slats are recommended for all doors exposed to the elements. They are of great importance in resisting corrosion.

At Right: **End View of Curtain with Bronze Bottom Slats**

Bottom slats of bronze or rustless steel protect the most vulnerable part of all exposed doors

Motor Driven Units

Cornell motor drives are made in a self-contained unit, completely assembled in the shop. The 1932 model Cornell Operators are specially designed and constructed for rolling doors. The worm is placed under the worm wheel, is completely enclosed, and runs in an oil bath.

Automatic starters and push buttons are furnished with all installations.

Electric brakes are furnished and an emergency hand chain operator is disengageable from the floor if required.

Operation—On pushing button, the solenoid acts to open the brake and the door moves up or down, as the case may be, at a rate of approximately 1 ft. per second.

On reaching the top or bottom of the door travel, the limit switch operates, automatically cuts off the current, stops the motor, cuts out the brake magnet and lets the brake go on with full power, locking the entire mechanism against further travel. The action is foolproof.

Door may be stopped at any point in its travel by simply pushing the stop button. This operation automatically puts on the brake and the door stops promptly.

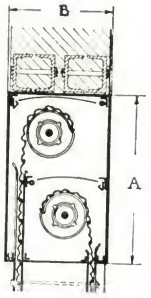
Catalogue and Service

Write for profusely illustrated 32-page catalogue containing full dimensions and specifications, and an abundance of comprehensive information.

Dimension drawings, etc., will be prepared to suit your requirements.

Our Department of Engineering is at your disposal for competent advice or suggestion.

No charge is made for any of the above and no obligation is involved in this voluntary service.



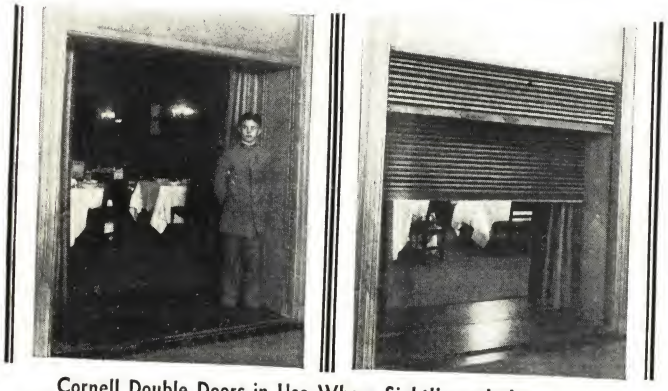
Left:

Types (Llenroc) 101A or 111A Double Doors in Fire Wall

One Coiling Above the Other.

A = 32 ins. for doors up to 8 ft. net height. Add 1 in. for every additional foot of height.

B = 19 ins. for doors up to 8 ft. net height. Add 1 in. for every two additional feet of height

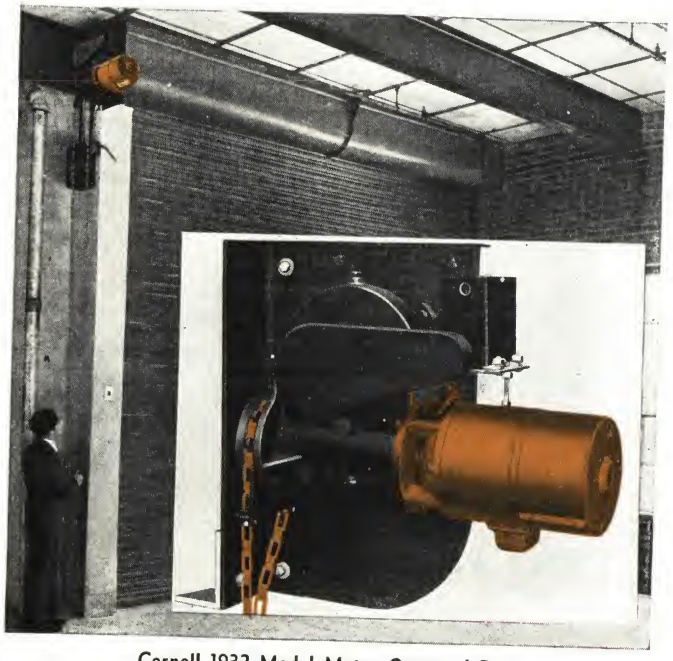


Cornell Double Doors in Use Where Sightliness Is Imperative

Cornell Fire Doors, between jambs, can be made invisible when open, making them practical for the most luxurious interiors, yet ready to fulfill their purpose. The fascia plates are entirely hidden by plaster (see diagram diagonally above)

3 of 42 Cornell Counter Shutters

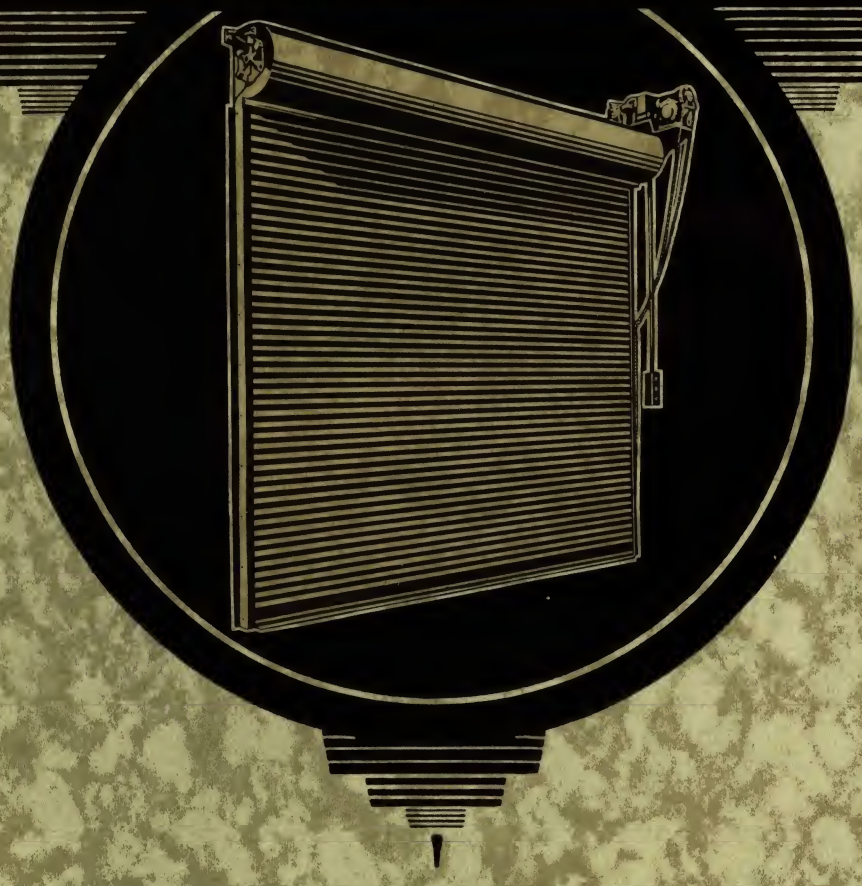
Union News Co. Booths, South Station, Boston, Mass.



Cornell 1932 Model Motor Operated Door

Cornell Operator is not a stock gear operating unit, it is specially designed for rolling doors. Note the clean, compact, self-contained unit, eliminating all exposed parts. Controlled by push buttons at any point

MAHON
ROLLING
STEEL DOORS



THE R. C. MAHON COMPANY
DETROIT, MICHIGAN

THE R. C. MAHON COMPANY

Manufacturers of Rolling Steel Doors

DETROIT, MICH.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

Product

MAHON ROLLING STEEL DOORS.

For Mahon Permanent Steel Floor Forms, Steel Roof Deck, Kalamein and Tin Clad Doors, and Cast Iron Roof Sumps, see Manufacturers' Index.

MAHON STEEL ROLLING DOORS

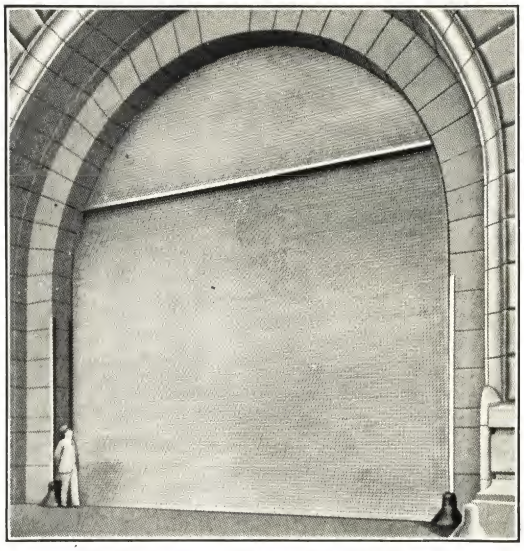
APPROVED BY THE UNDERWRITERS' LABORATORIES INC.

Standard Doors

Mahon Standard (non-labeled) Rolling Steel Doors are made with specially designed interlocking slats rolled from copper bearing electro-galvanized steel, and fitted with malleable iron end locks to provide maximum rigidity and ease of operation. The tubular roller shaft to which the shutter curtain is attached is exceptionally rigid, and operates in ball and bronze bearings fitted into the end brackets. End brackets are heavy gray iron castings. These are of numerous sizes and shapes to accommodate the many door sizes and the various types of operators.

Mahon Rolling Steel Doors Meet Every Requirement Under Any Condition

Mahon Rolling Steel Doors are manufactured from the highest grade material obtainable. They are produced in many labeled and non-labeled types to meet every requirement of industrial or commercial use.

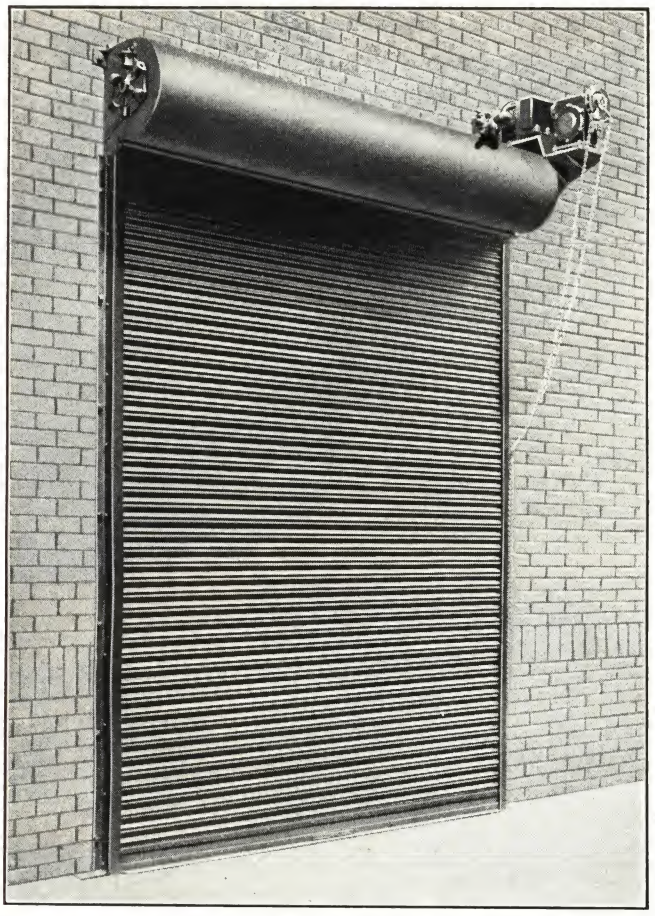


Mahon Rolling Steel Door, 29x32 Ft.—One of Thirty Furnished for Pier No. 1, San Francisco Harbor

Interlocking Slats Showing Arrangement of Malleable Iron End Locks As Used on Mahon Standard Rolling Steel Doors

Mahon Rolling Steel Door Installed at the Consolidated Paper Company's Plant, Monroe, Mich.

Mahon Rolling Steel Doors Installed in Pier No. 1, San Francisco Harbor



A Typical Installation of a Mahon Rolling Steel Door Equipped with Standard Power Operating Unit

The weight of the shutter curtain is counterbalanced by means of coil springs located inside the roller shaft. The tension of these springs is adjustable to provide perfect balance.

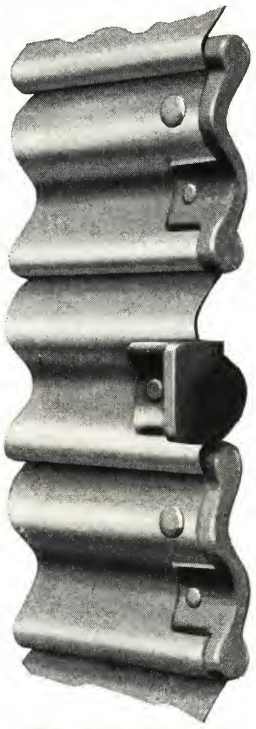
This feature, particularly important in manually operated doors, safely maintains the position of the shutter curtain at all times, and, in the case of electrically operated doors, relieves the load on the operating mechanism.

Installation

Mahon Rolling Steel Doors can be installed either on the face of the wall or in the door opening. Mounting on the face of the wall with guide channels clear of the door jambs is general practice. This method allows 100% clear opening and provides protection for the guides. However, in many instances where headroom is limited, or other conditions prohibit "face of wall" mounting, Mahon Rolling Steel Doors can be installed in the door opening between jambs.

In "between jambs" installations the height of the door opening is decreased, due to the insertion of the roller housing below the lintel (the amount depending upon the height of the door opening) and the opening width is also decreased due to the insertion of the guide channels on the jambs.

These objections may be eliminated in new construction, where "between jambs" installations are desired, by including built-in-guide channels and providing space for the roller housing and operating mechanism in the original plans.



Mahon Interlocking Slats Showing Application of Wind Lock Lug

Intermediate Hinged Posts

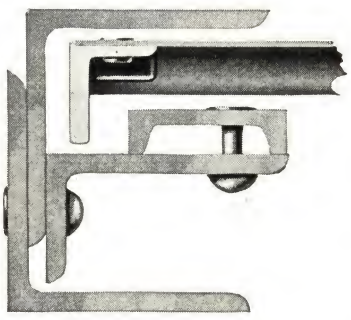
In some instances where unusually wide openings are desired, it is more economical to use two rolling steel doors with an intermediate hinged post or removable post between. Mahon Rolling Steel Doors installed in this manner can be equipped with either mechanical or power operators, and can be made to operate simultaneously or individually as desired.

The intermediate post between doors can be released at the floor and removed or swung up clear of the opening after the doors are opened.

Wind Locks

Mahon Rolling Steel Doors of unusual width are fitted with wind locks to eliminate the possibility of the door pulling out of the guides due to excessive wind pressure.

Special end brackets and guides are provided to accommodate the wind lock lugs which are attached to the interlocking slats at intervals between the regular malleable iron end locks.



Cross Section of Guide Channel Furnished with Doors Equipped with Wind Locks

Guide Mouth of Special End Bracket Furnished with Doors Equipped with Wind Locks

These wind locks are designed and installed so as to insure safe and easy operation even under extraordinary wind pressure.

Operation—Mechanical and Power Operators

Mahon Rolling Steel Doors can be furnished equipped with handles on the bottom rail, continuous chain gear operator, hand crank operator, or power operating units.

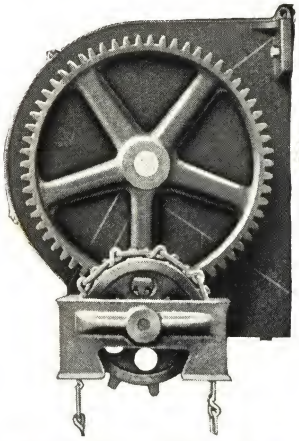
Doors of moderate size equipped with handles on the bottom rail, for manual operation, are perfectly balanced by means of an adjustable counterbalancing mechanism. They can be easily opened or closed by one person.

The continuous chain gear operator for medium sized doors consists of a continuous chain, sprocket, and a series of gears. When installed on Mahon Underwriters' Labeled Rolling Steel Doors, the chain gear operator is equipped with an automatic release, which,

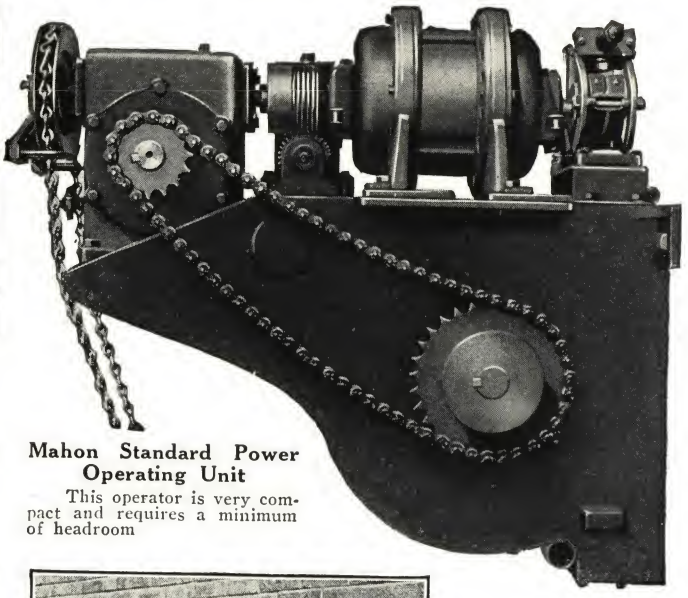
in case of fire, disengages it simultaneously with the release of the automatic closing mechanism.

The hand crank operator consists of a hand crank gear box, shaft with universal joints, and a series of gears on the roller bracket. Crank can be located on either side of the wall, or, removable cranks can be furnished and the operator installed for operation of the door from both sides of the wall.

Mahon Power Operating Units are available in two types: Standard and Special.



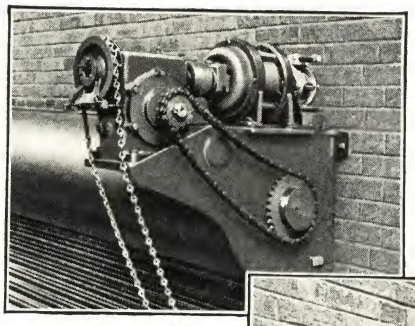
Mahon Simple Chain Gear Operator



Mahon Standard Power Operating Unit

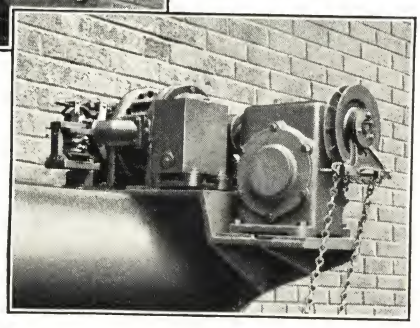
This operator is very compact and requires a minimum of headroom

Mahon Compound Chain Gear Operator and the End Bracket and Gear Arrangement for Mahon Hand Crank Operator



Right and Left Quarter Views of Mahon Standard Power Operating Unit

Showing the ingenious arrangement of various units in relation to the roller housing



Right

Shows Auxiliary Hand Chain Sprocket and Disposition of Chain During Power Operation

The Standard power operating unit is mounted directly on the end bracket of the roller housing, while the Special power operating unit is mounted on an independent bracket which can be located so as to meet unusual conditions where the Standard unit is not practicable.

The Standard power operating unit, however, is very compact and requires a minimum of headroom. It consists of an electric motor, speed reducer, sprockets and chain.

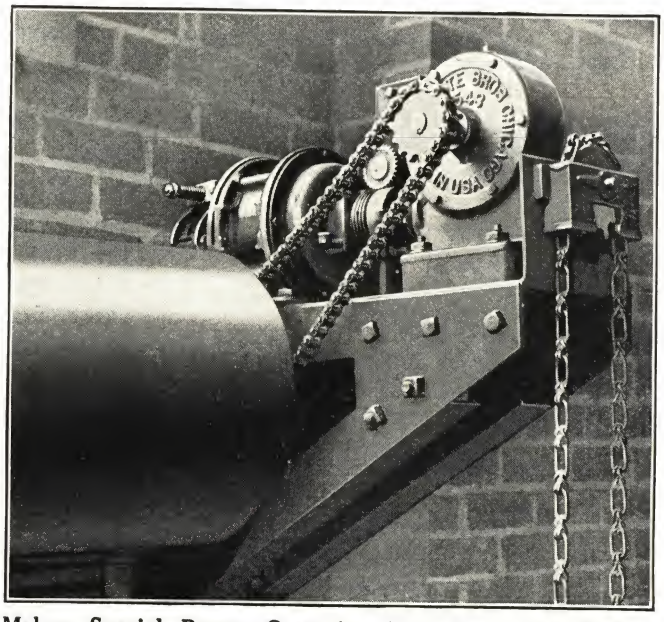
Control is by means of a push button switch, including "open" and "close" buttons, and an emergency "stop" button.

The door is set in motion by pushing either the "open" or "close" buttons, and is automatically stopped in the open or closed position by means of a limit switch and a solenoid brake. The door can be instantly stopped in any position by pushing the emergency "stop" button.

Both Mahon Standard and Special Power Operators are equipped with an auxiliary continuous chain and sprocket for operation in case of failure in the electrical system. The chain normally hangs over the chain guide when not in use.

All wiring and conduit to be furnished by others, but must be installed in accordance with wiring diagram furnished by THE R. C. MAHON COMPANY.

Note: Requests for estimates or bids on power operated doors must include information as to type of current available.



Mahon Special Power Operating Unit Used with Mahon Standard Rolling Steel Doors Where Conditions Do Not Permit Use of Mahon Standard Power Operating Unit

Mahon Underwriters' Labeled Rolling Steel Doors

Mahon Underwriters' Labeled Doors are approved by the Underwriters' Laboratories, Inc., within certain limitations in total area as specified by the Underwriters' for various opening classifications. These limitations are based on requirements of the Underwriters' Laboratories, Inc., and apply to all fire doors of this type.

Fire Wall Doors, Class "A"—Approved for fire wall openings not exceeding 80 sq. ft. in area.

Vertical Shaft Doors, Class "B"—Approved for vertical shaft openings not exceeding 80 sq. ft. in area.

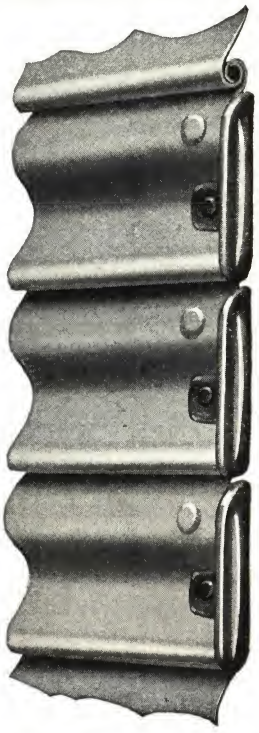
Corridor and Room Partition Doors, Class "C"—Approved for corridor or room partition openings not exceeding 80 sq. ft. in area.

Exterior Doors, Class "D" — Approved for exterior wall openings not exceeding 100 sq. ft. in area.

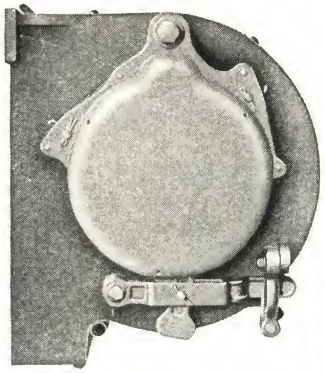
Note: For 100% rating neither dimension of the above listed openings may exceed 12 ft. Mahon Rolling Steel Fire Doors, however, can be manufactured in strict accordance with the Underwriters' specifications and furnished with manufacturer's certificate for larger openings where fire protection is desirable, or where insurance ratings are involved.

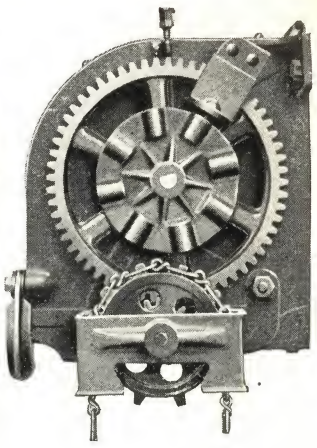
Operation—Underwriters' labeled rolling steel doors normally remain open. They are equipped with an automatic closing mechanism and release device which is actuated by fusible links in case of fire.

These doors, however, can be operated in general service if desired, being fitted with handles on the bottom rail for manual operation, or equipped with a chain gear operator for mechanical operation.

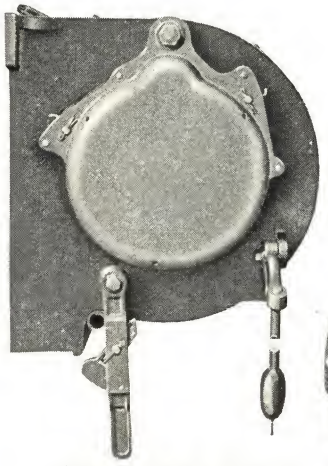


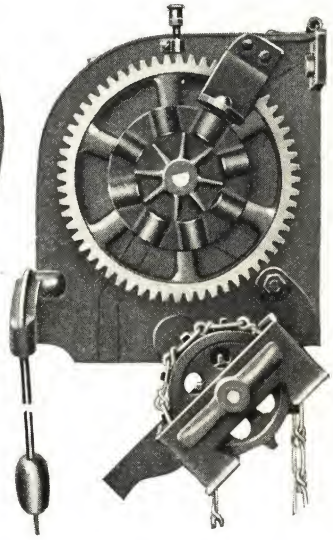
Mahon Interlocking Slats with Continuous Malleable Iron End Locks as Required by the Underwriters' Laboratories, Inc.





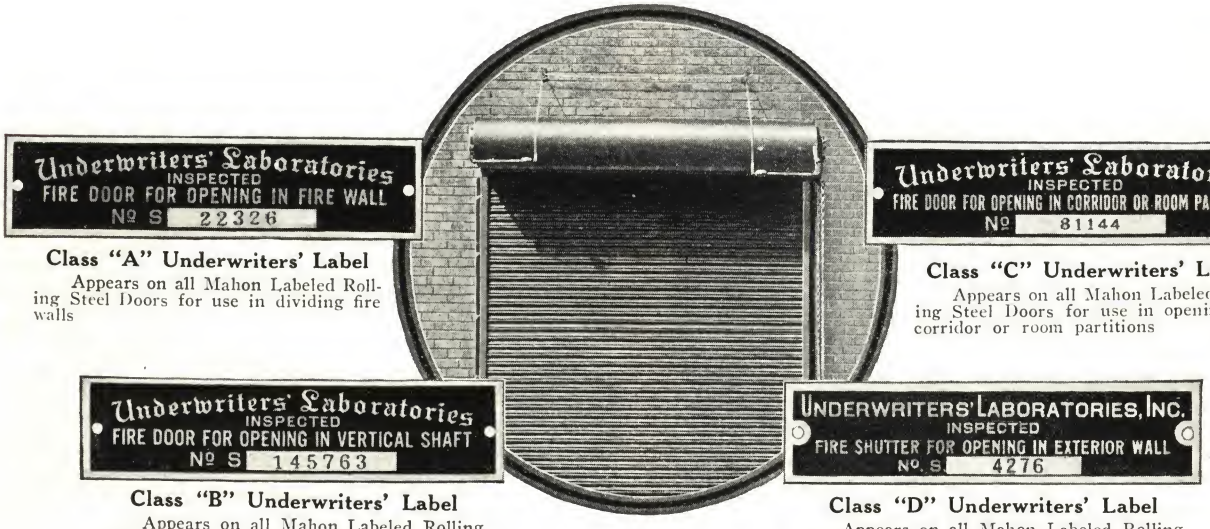
Above: Release device and governor for automatic closing mechanism. *Right:* Automatically released chain gear operator used on Mahon Underwriters' Labeled Doors





Above is release device released. *Right* is the chain gear operator disengaged. In case of fire the chain gear operator is disengaged simultaneously with the release of the automatic closing mechanism

In the event of fire, the automatic closing mechanism is released by means of fusible links and the door closes. A flame stop baffle plate, also released



Class "A" Underwriters' Label
Appears on all Mahon Labeled Rolling Steel Doors for use in dividing fire walls

Class "C" Underwriters' Label
Appears on all Mahon Labeled Rolling Steel Doors for use in openings in corridor or room partitions

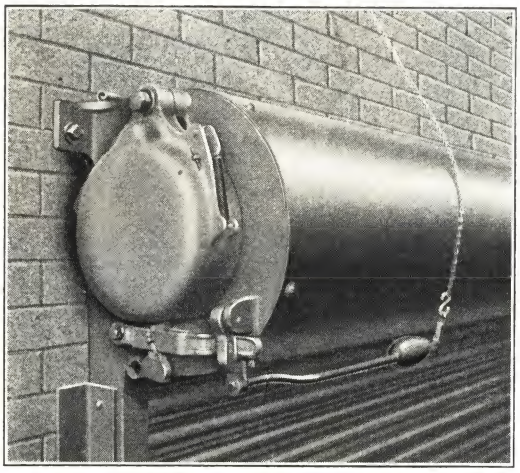
Class "B" Underwriters' Label
Appears on all Mahon Labeled Rolling Steel Doors for use in openings in vertical shafts

Class "D" Underwriters' Label
Appears on all Mahon Labeled Rolling Steel Doors for use in openings in exterior walls

Mahon Underwriters' Labeled Rolling Steel Doors are built in strict accordance with Underwriters' specifications

automatically, closes the space between the hood and the roller shaft preventing the passage of flames through the hood. In the case of mechanically operated Underwriters' labeled doors, the chain gear operator is automatically disengaged simultaneously with the release of the automatic closing mechanism.

Mahon Underwriters' Labeled Rolling Steel Doors can be quickly reset by one person and put in operation without delay after automatic closing.



Mahon Governor and Release Device for Automatic Closing Mechanism Used on Mahon Underwriters' Labeled Doors

Fusible Link

Type used on Mahon Underwriters' Labeled Doors to release the automatic closing mechanism in case of fire

Mahon Rolling Steel Door, Type 200-ML

An Underwriters' labeled Class "A," "B," "C" and "D" push-up type door, mounted on the face of the wall.

For detailed installation drawing see page 9

Mahon Rolling Steel Door, Type 100-M

A Standard non-labeled, non-automatic push-up type door mounted on the face of the wall.

For detailed installation drawing see page 8

Mahon Rolling Steel Door, Type 300-ML

An Underwriters' labeled Class "A," "B," "C" and "D" push-up type door, mounted in the opening between jambs.

For detailed installation drawing see page 10

Mahon Rolling Steel Door, Type 400-ML

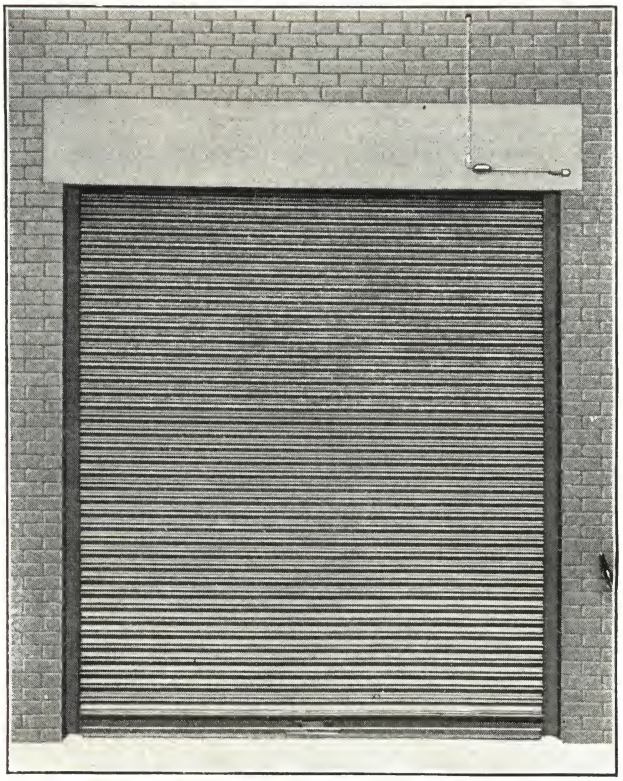
Underwriters' labeled Class "A" double push-up type door, mounted in the opening between jambs.

For detailed installation drawing see page 11

Mahon Rolling Steel Door, Type 600-CHL

An Underwriters' labeled Class "A," "B," "C" and "D" chain gear operated door mounted on the face of the wall.

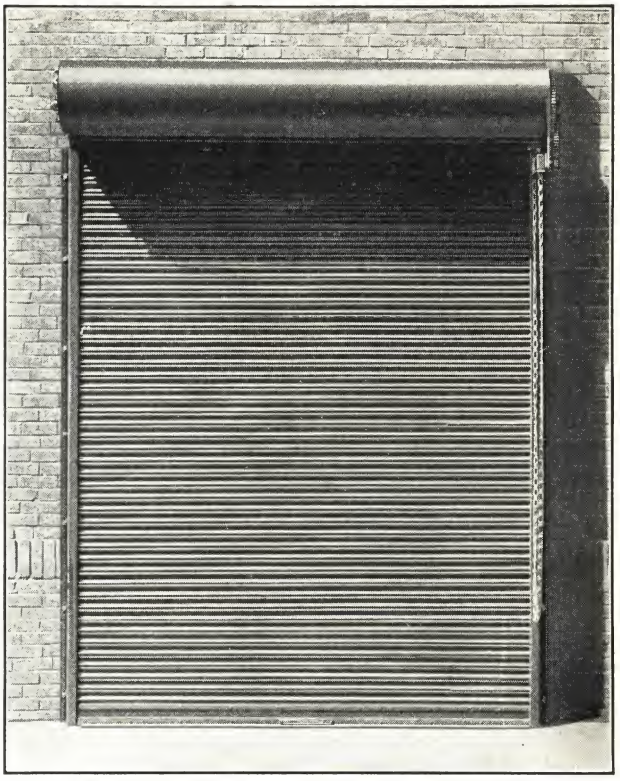
For detailed installation drawing see page 13



Mahon Rolling Steel Door, Type 500-ML

Underwriters' labeled Class "A" double push-up type door, mounted in the opening between jambs.

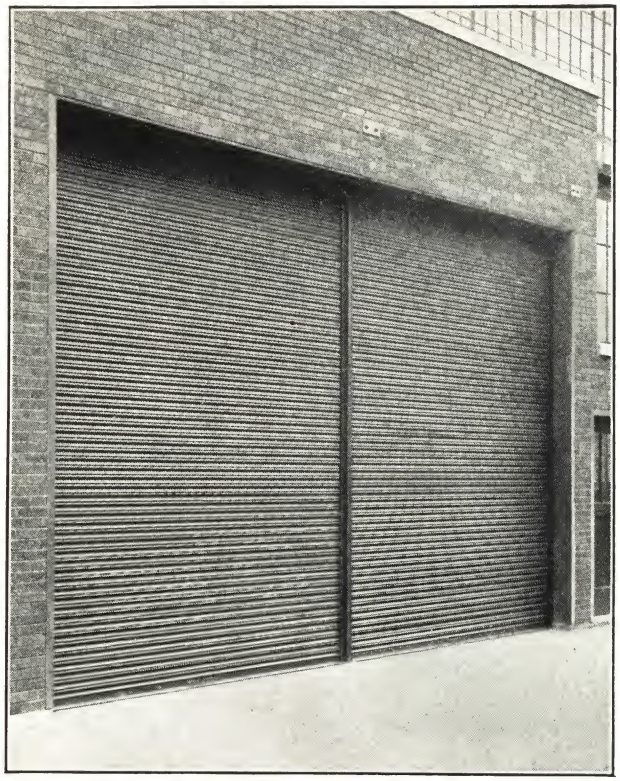
For detailed installation drawing see page 12



Mahon Rolling Steel Door, Type 700-CH

A Standard chain gear operated door mounted on the face of the wall.

For detailed installation drawing see page 14



Mahon Rolling Steel Door, Type 750-CH

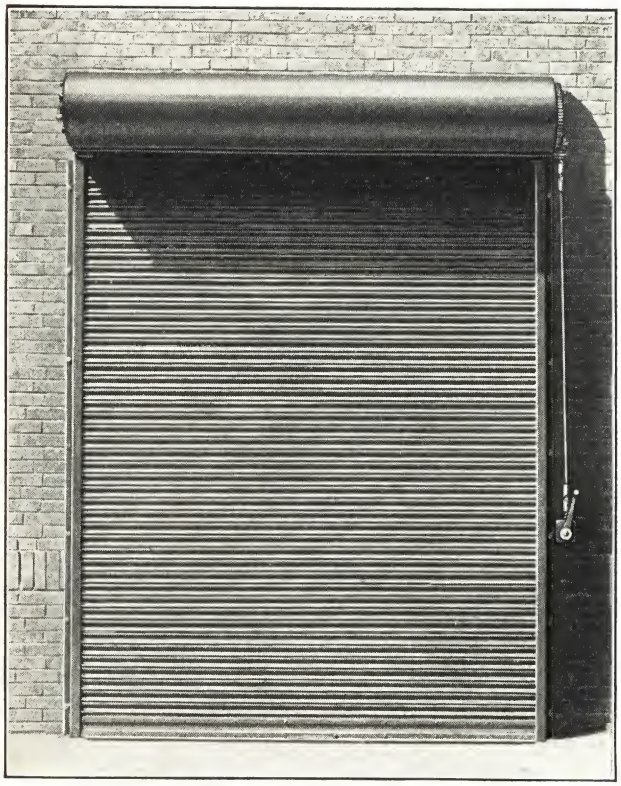
Two Standard chain gear operated doors mounted on the face of the wall with a special center bracket and an intermediate hinged or removable post between.

For detailed installation drawing see page 15

Mahon Rolling Steel Door, Type 900-P

A Standard power operated door mounted on the face of the wall.

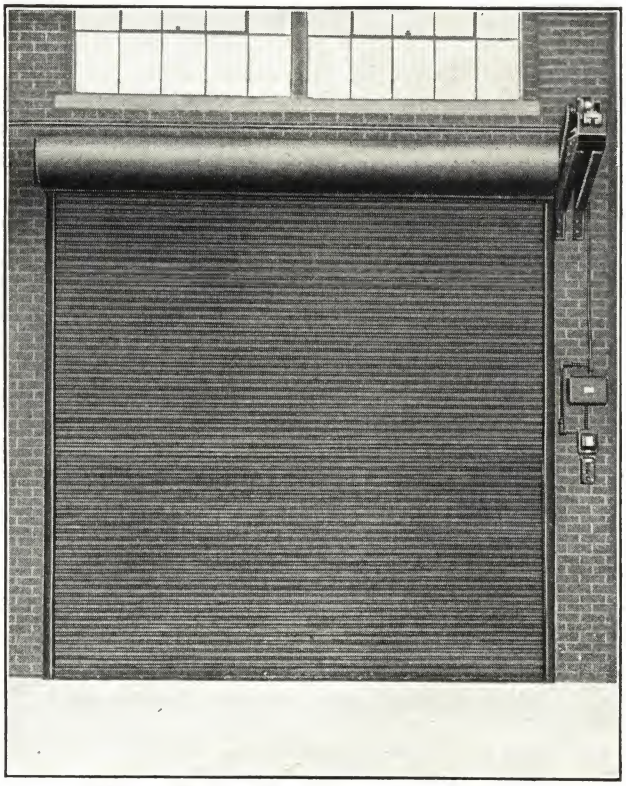
For detailed installation drawing see page 17



Mahon Rolling Steel Door, Type 800-CR

A Standard crank operated door mounted on the face of the wall.

For detailed installation drawing see page 16



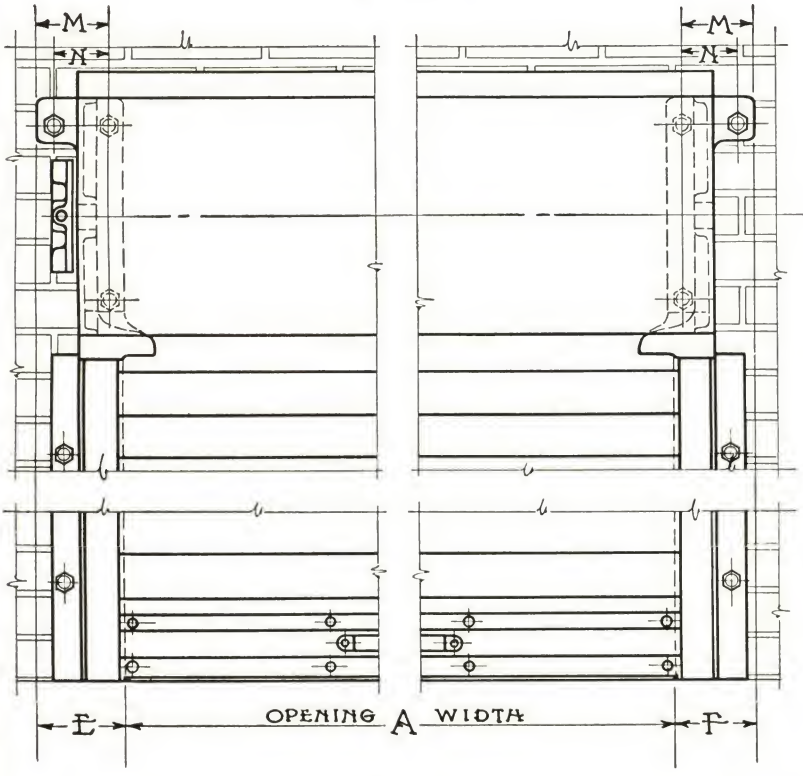
Mahon Rolling Steel Door, Type 950-P

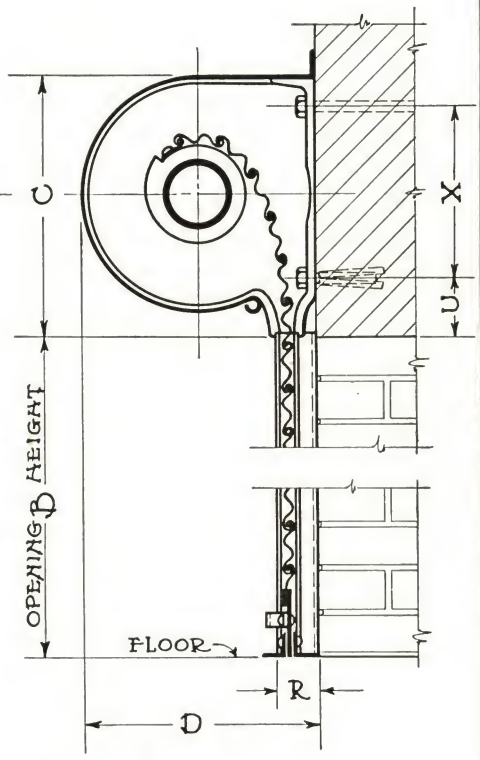
A Standard door equipped with Mahon Special Power Operating Unit.

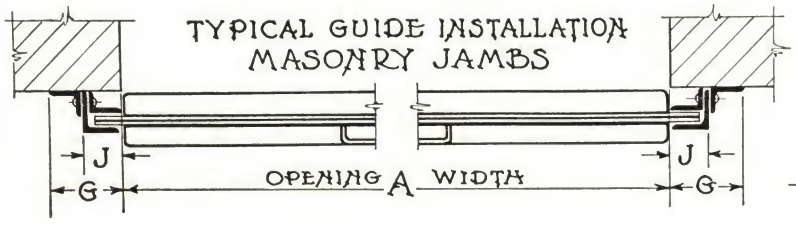
For detailed installation drawing see page 18

Standard Push-up Type—Mounted on Face of Wall

TYPE 100-M







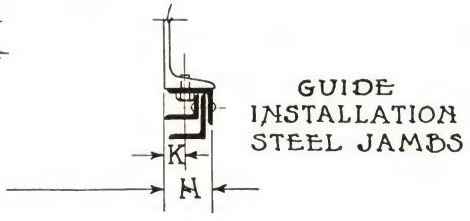


TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

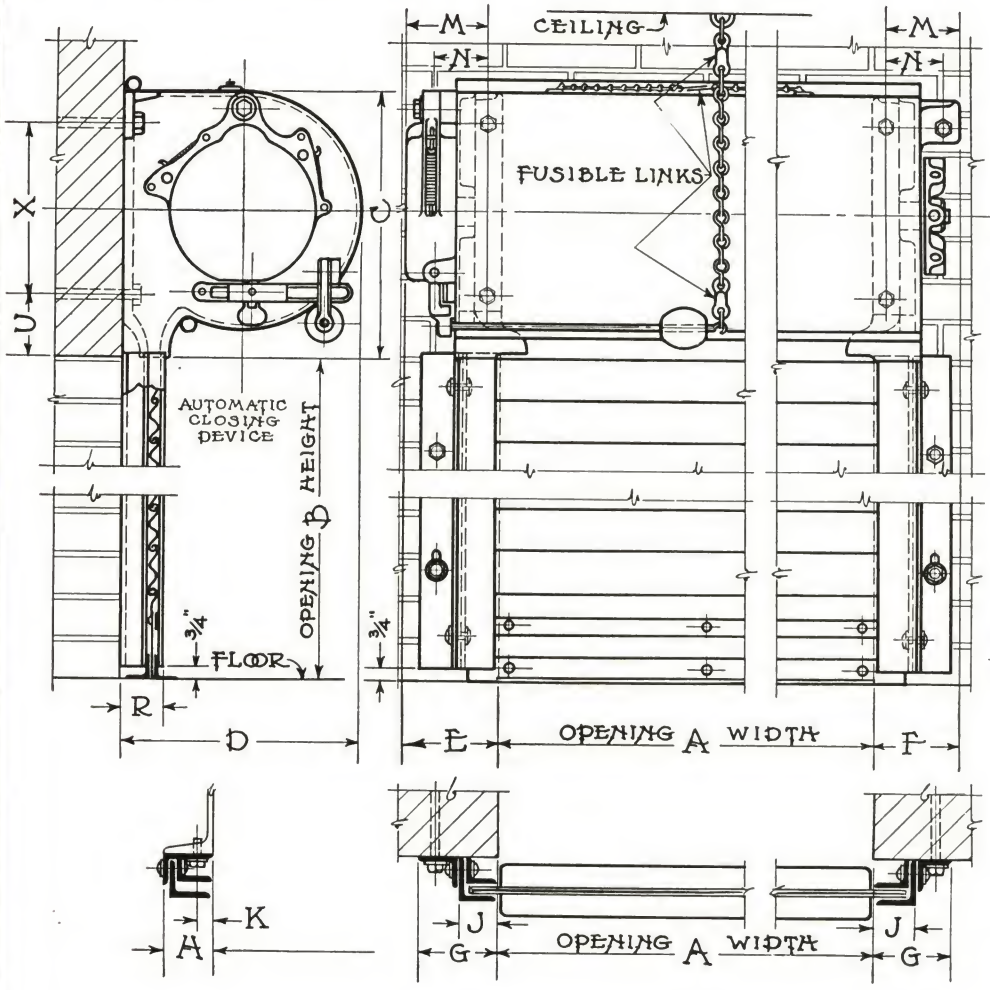
A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
3'-6"	7'-0"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
4'-0"	7'-6"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
4'-6"	8'-0"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
5'-0"	8'-6"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
5'-6"	9'-0"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
6'-0"	9'-6"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
7'-0"	10'-0"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
8'-0"	10'-6"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
9'-0"	11'-0"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
10'-0"	11'-6"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"
12'-0"	12'-0"	16"	14½"	5"	5"	4¼"	2½"	2¼"	1⅛"	4½"	3⅜"	3⅝"	10½"	2⅞"

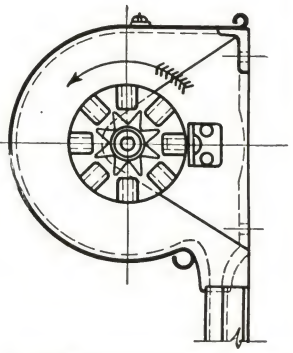
100-M

Push-up Type—Underwriters' Labeled Class "A," "B," "C" and "D"—Mounted on Face of Wall

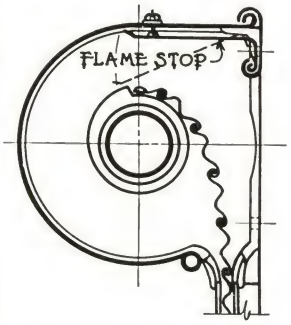
NOTE—
3" ADDITIONAL CLEARANCE REQUIRED ON THIS END FOR INSTALLATION OF GOVERNOR

TYPE 200-ML





AJUSTING WHEEL FOR COUNTERBALANCING SPRING



CROSS SECTION THROUGH ROLLER HOUSING SHOWING FLAME STOP

TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
4'-0"	6'-0"	16"	14½"	5¾"	5½"	4¼"	2½"	2¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
4'-6"	6'-6"	16"	14½"	5¾"	5½"	4¼"	2½"	2¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
5'-0"	7'-0"	16"	14½"	5¾"	5½"	4¼"	2½"	2¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
5'-6"	7'-6"	16"	14½"	5¾"	5½"	4¼"	2½"	2¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
6'-0"	8'-0"	16"	14½"	5¾"	5½"	4¼"	2½"	2¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
7'-0"	8'-6"	16"	14½"	6¼"	6"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
8'-0"	9'-0"	16"	14½"	6¼"	6"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
9'-0"	9'-6"	16"	14½"	6¾"	6½"	5¼"	3½"	3¼"	1⅛	5"	3⅜"	3⅝"	10½"	2⅞"
10'-0"	10'-0"	16"	14½"	6¾"	6½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
11'-0"	11'-0"	18"	16½"	7¼"	7"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	12½"	3⅝"
12'-0"	12'-0"	18"	16½"	7¼"	7"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	12½"	3⅝"

200-ML

Push-up Type—Underwriters' Labeled Class "A," "B," "C" and "D"—Mounted Between Jambs

TYPE 300-ML

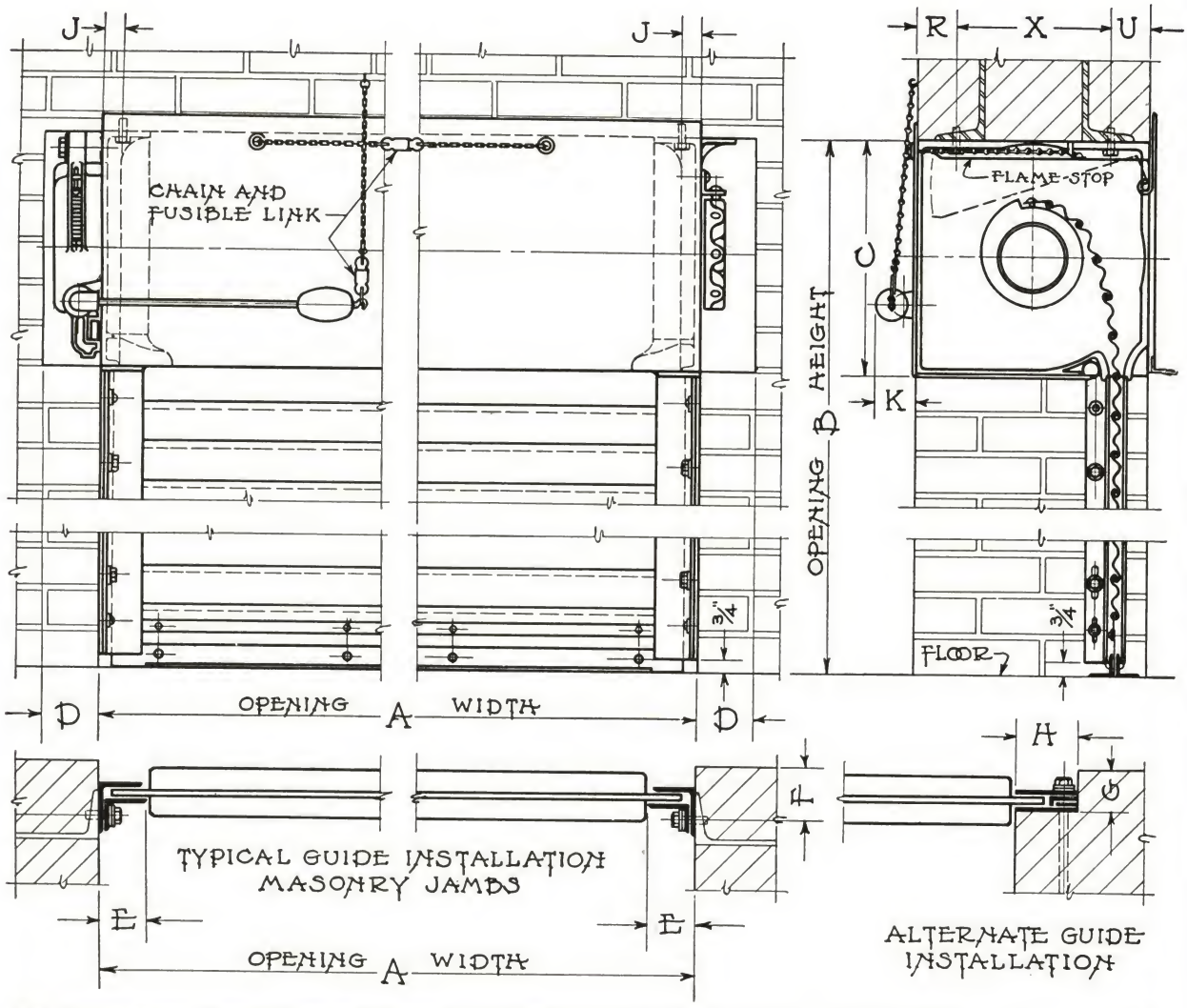


TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
6'-0"	6'-0"	15"	6¼"	2¼"	3⅝"	2⅝"	3¾"	1½"	2½"			2½"	9½"	2½"
6'-6"	6'-6"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	2½"
7'-0"	7'-0"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	2½"
7'-6"	7'-6"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	2½"
8'-0"	8'-0"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	2½"
8'-6"	8'-6"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	2½"
9'-0"	9'-0"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	2½"
9'-6"	9'-6"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	2½"
10'-0"	10'-0"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	2½"
10'-6"	10'-6"	15"	6¼"	3¾"	3⅝"	2⅝"	5¼"	1½"	2½"			2½"	9½"	2½"
11'-0"	11'-0"	15"	6¼"	3¾"	3⅝"	2⅝"	5¼"	1½"	2½"			2½"	9½"	2½"

300-ML

Double Push-up Type—Underwriters' Labeled Class "A"—Mounted Between Jambs

TYPE 400-ML

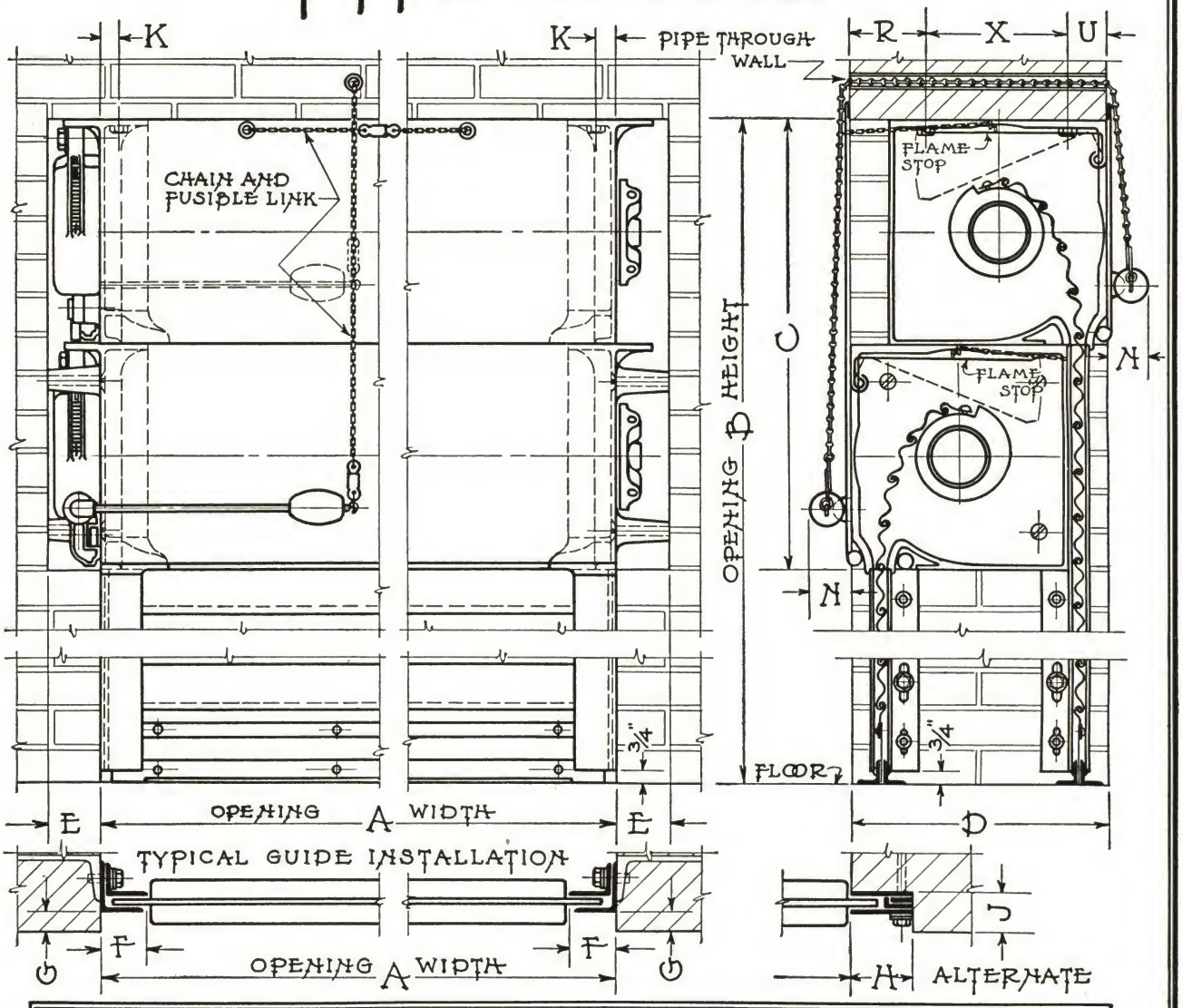


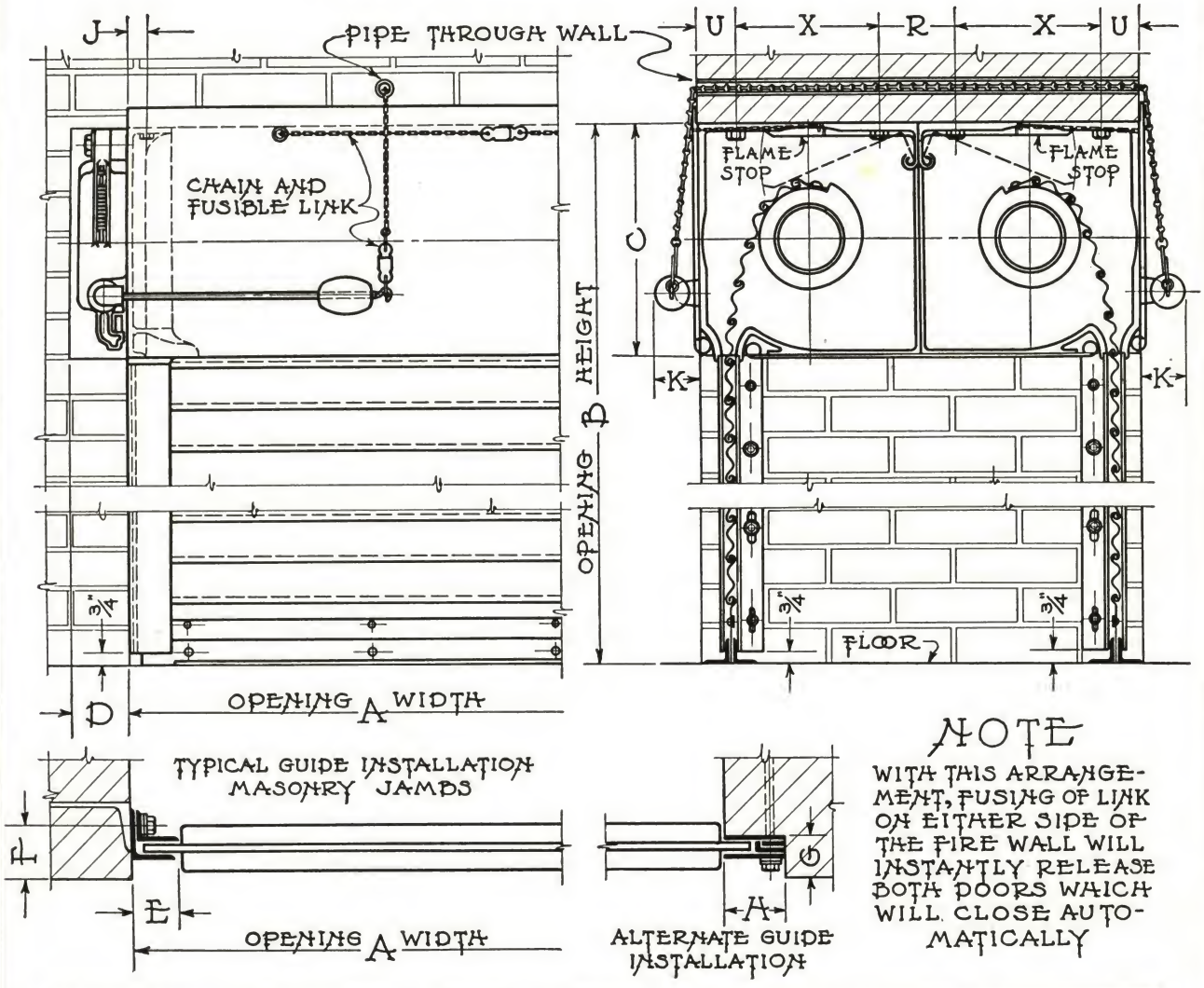
TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
6'-0"	6'-0"	2'-6"	17½"	6¼"	2¼"	1½"	3¾"	2⅝"	1½"		2½"	2½"	9½"	5½"
6'-6"	6'-6"	2'-6"	17½"	6¼"	2¾"	1½"	4¼"	2⅝"	1½"		2½"	2½"	9½"	5½"
7'-0"	7'-0"	2'-6"	17½"	6¼"	2¾"	1½"	4¼"	2⅝"	1½"		2½"	2½"	9½"	5½"
7'-6"	7'-6"	2'-6"	17½"	6¼"	2¾"	1½"	4¼"	2⅝"	1½"		2½"	2½"	9½"	5½"
8'-0"	8'-0"	2'-6"	17½"	6¼"	2¾"	1½"	4¼"	2⅝"	1½"		2½"	2½"	9½"	5½"
8'-6"	8'-6"	2'-6"	17½"	6¼"	3¼"	1½"	4¾"	2⅝"	1½"		2½"	2½"	9½"	5½"
9'-0"	9'-0"	2'-6"	17½"	6¼"	3¼"	1½"	4¾"	2⅝"	1½"		2½"	2½"	9½"	5½"
9'-6"	9'-6"	2'-6"	17½"	6¼"	3¼"	1½"	4¾"	2⅝"	1½"		2½"	2½"	9½"	5½"
10'-0"	10'-0"	2'-6"	17½"	6¼"	3¼"	1½"	4¾"	2⅝"	1½"		2½"	2½"	9½"	5½"
10'-6"	10'-6"	2'-6"	17½"	6¼"	3¾"	1½"	5¼"	2⅝"	1½"		2½"	2½"	9½"	5½"
11'-0"	11'-0"	2'-6"	17½"	6¼"	3¾"	1½"	5¼"	2⅝"	1½"		2½"	2½"	9½"	5½"

400-ML

Double Push-up Type—Underwriters' Labeled Class "A"—Mounted Between Jambs

TYPE 500 ML



NOTE

WITH THIS ARRANGEMENT, FUSING OF LINK ON EITHER SIDE OF THE FIRE WALL WILL INSTANTLY RELEASE BOTH DOORS WHICH WILL CLOSE AUTOMATICALLY

TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

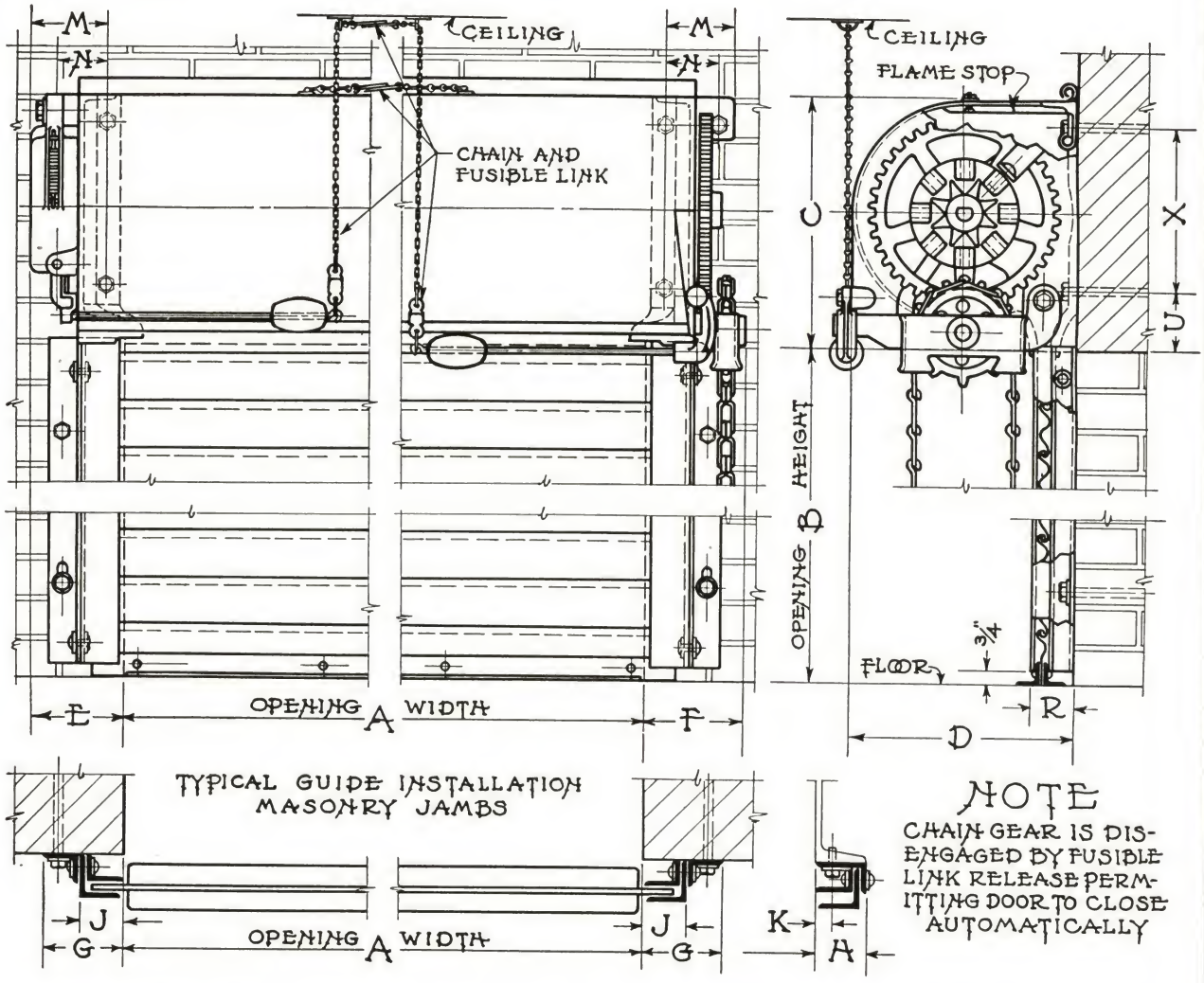
A	B	C	D	E	F	G	H	J	K	M	N	U	X	P
6'-0"	6'-0"	15"	6¼"	2¼"	3⅝"	2⅝"	3¾"	1½"	2½"			2½"	9½"	5"
6'-6"	6'-6"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	5"
7'-0"	7'-0"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	5"
7'-6"	7'-6"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	5"
8'-0"	8'-0"	15"	6¼"	2¾"	3⅝"	2⅝"	4¼"	1½"	2½"			2½"	9½"	5"
8'-6"	8'-6"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	5"
9'-0"	9'-0"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	5"
9'-6"	9'-6"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	5"
10'-0"	10'-0"	15"	6¼"	3¼"	3⅝"	2⅝"	4¾"	1½"	2½"			2½"	9½"	5"
10'-6"	10'-6"	15"	6¼"	3¾"	3⅝"	2⅝"	5¼"	1½"	2½"			2½"	9½"	5"
11'-0"	11'-0"	15"	6¼"	3¾"	3⅝"	2⅝"	5¼"	1½"	2½"			2½"	9½"	5"

500-ML

Chain Gear Operated—Underwriters' Labeled Class "A," "B," "C" and "D"—Mounted on Face of Wall

TYPE 600-CHL

NOTE - 3" ADDITIONAL CLEARANCE REQUIRED ON THIS END FOR INSTALLATION OF GOVERNOR



NOTE

CHAIN GEAR IS DISENGAGED BY FUSIBLE LINK RELEASE PERMITTING DOOR TO CLOSE AUTOMATICALLY

TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
6'-0"	6'-0"	16"	14½"	5¾"	6½"	4¼"	2½"	2¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
6'-6"	6'-6"	16"	14½"	6¼"	7"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
7'-0"	7'-0"	16"	14½"	6¼"	7"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
7'-6"	7'-6"	16"	14½"	6¼"	7"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
8'-0"	8'-0"	16"	14½"	6¼"	7"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
8'-6"	8'-6"	16"	14½"	6¾"	7½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
9'-0"	9'-0"	16"	14½"	6¾"	7½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
9'-6"	9'-6"	16"	14½"	6¾"	7½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
10'-0"	10'-0"	16"	14½"	6¾"	7½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
10'-6"	10'-6"	16"	14½"	7¼"	8"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
11'-0"	11'-0"	18"	16½"	7¼"	8"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	12½"	3⅝"

600-CHL

Standard Chain Gear Operated—Mounted on Face of Wall

TYPE 700-CA

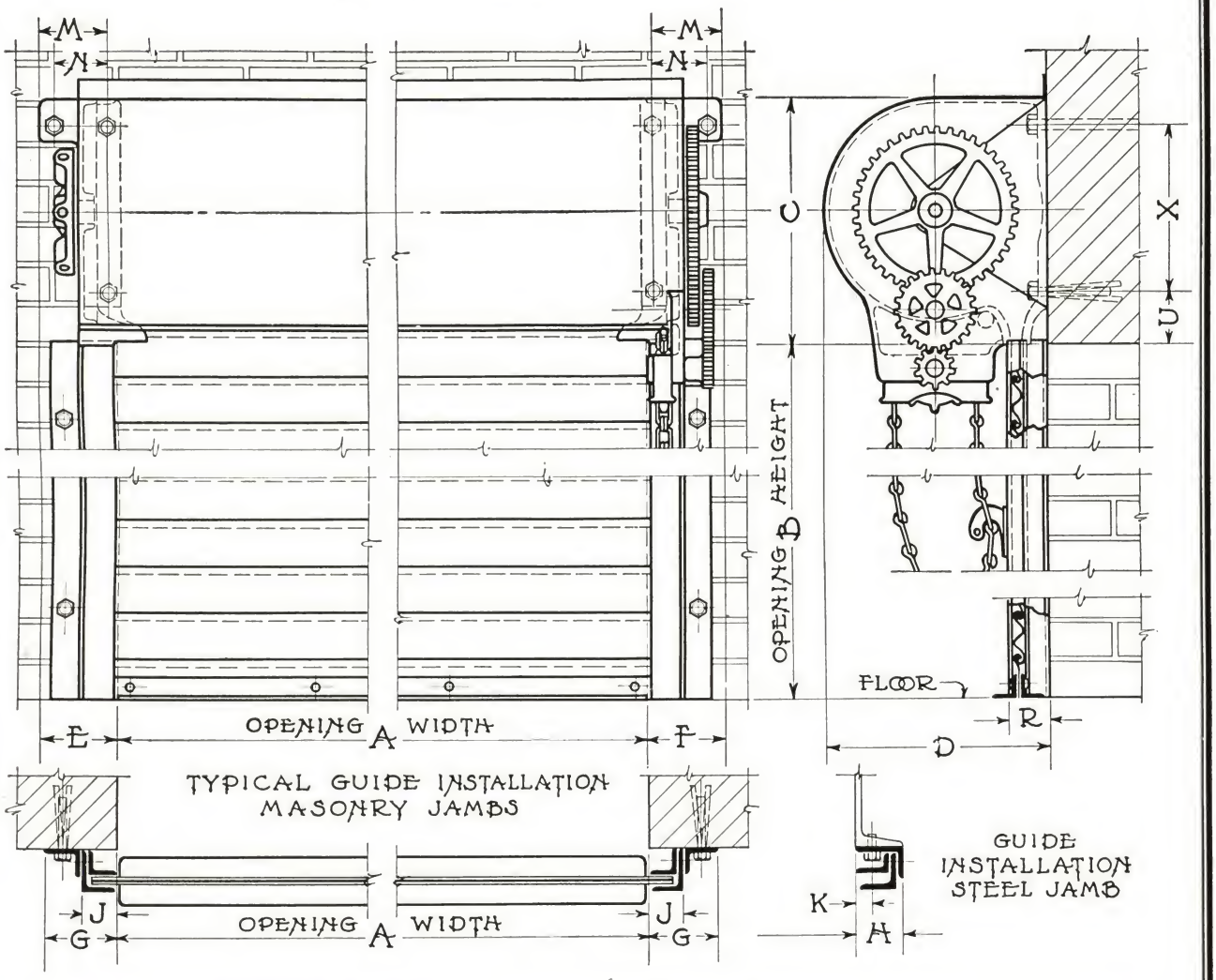


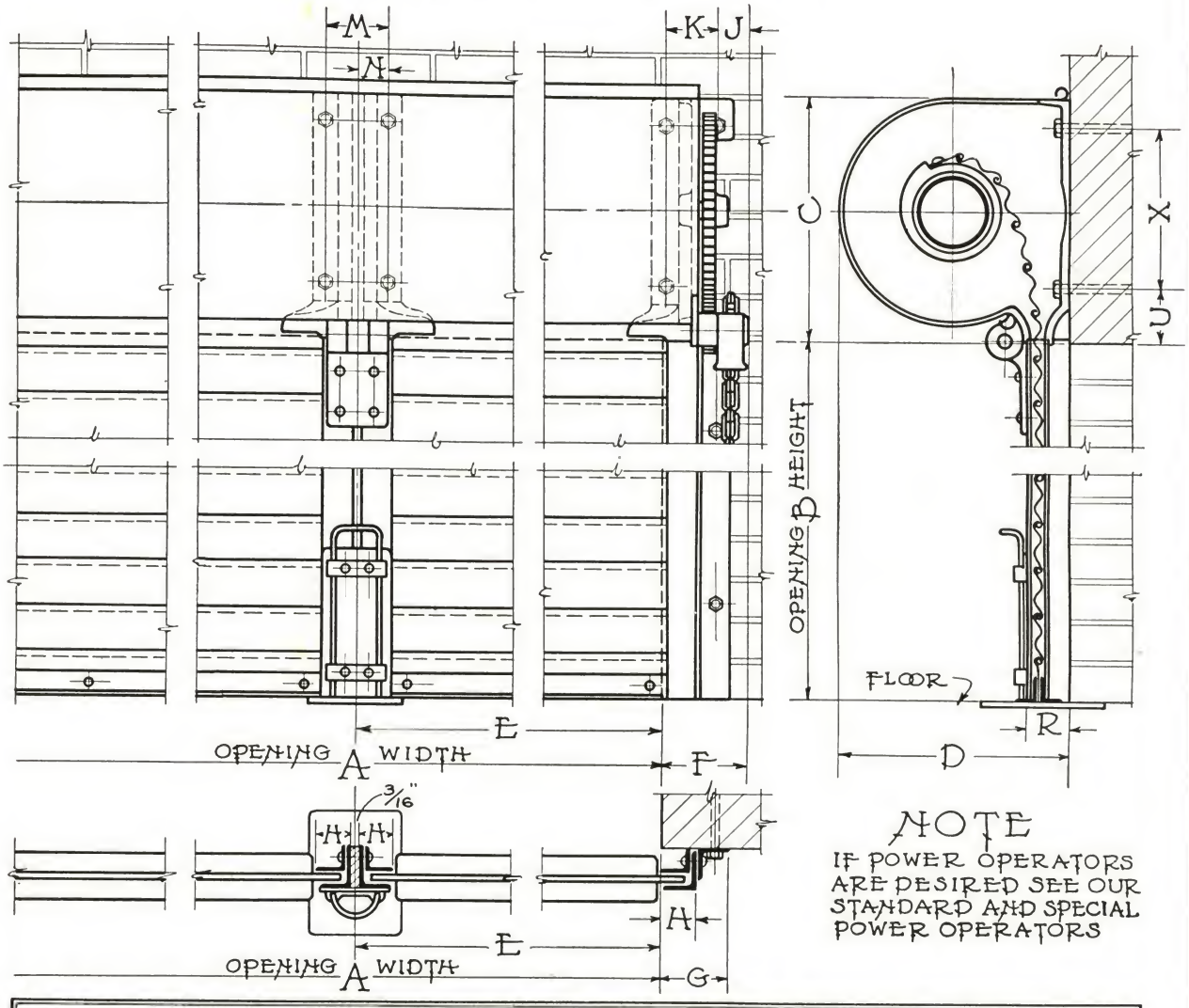
TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
12'-0"	12'-0"	16"	14½"	5½"	5½"	4¼"	2½"	2¼"	1⅛"	5"	3⅜"	3⅝"	10½"	2⅞"
14'-0"	14'-0"	18"	16½"	6"	6"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	12½"	3⅝"
16'-0"	16'-0"	20"	18½"	6"	6"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	14½"	3⅝"
18'-0"	18'-0"	20"	18½"	6"	6"	4¾"	3"	2¾"	1⅛"	5"	3⅜"	3⅝"	14½"	3⅝"
20'-0"	19'-0"	20"	18½"	6½"	6½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	14½"	3⅝"
22'-0"	20'-0"	20"	18½"	6½"	6½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	14½"	3⅝"
24'-0"	21'-0"	22"	20⅞"	6½"	6½"	5¼"	3½"	3¼"	1⅛"	5"	3⅜"	3⅝"	16⅛"	4¼"
26'-0"	22'-0"	22"	20⅞"	7"	7"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	16⅛"	4¼"
28'-0"	23'-0"	22"	20⅞"	7"	7"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	16⅛"	4¼"
30'-0"	24'-0"	22"	20⅞"	7"	7"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	16⅛"	4¼"
32'-0"	25'-0"	22"	20⅞"	7"	7"	5¾"	4"	3¾"	1⅛"	5"	3⅜"	3⅝"	16⅛"	4¼"

700-CH

Standard Chain Gear Operated with Intermediate Hinged Post

TYPE 750-CA



NOTE
IF POWER OPERATORS ARE DESIRED SEE OUR STANDARD AND SPECIAL POWER OPERATORS

TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
20'-0"	8'-0"	16"	14½"	10'-0"	5½"	4¼"	2¼"	1⅝"	3⅜"	4½"	2¼"	3⅝"	10½"	2⅞"
22'-0"	9'-0"	16"	14½"	11'-0"	5½"	4¼"	2¼"	1⅝"	3⅜"	4½"	2¼"	3⅝"	10½"	2⅞"
24'-0"	10'-0"	16"	14½"	12'-0"	5½"	4¼"	2¼"	1⅝"	3⅜"	4½"	2¼"	3⅝"	10½"	2⅞"
26'-0"	11'-0"	16"	14½"	13'-0"	6"	4¾"	2¾"	1⅝"	3⅜"	4½"	2¼"	3⅝"	10½"	2⅞"
28'-0"	12'-0"	16"	14½"	14'-0"	6"	4¾"	2¾"	1⅝"	3⅜"	4½"	2¼"	3⅝"	10½"	2⅞"
30'-0"	13'-0"	18"	16½"	15'-0"	6"	4¾"	2¾"	1⅝"	3⅜"	4½"	2¼"	3⅝"	12½"	3⅝"
32'-0"	14'-0"	18"	16½"	16'-0"	6"	4¾"	2¾"	1⅝"	3⅜"	4½"	2¼"	3⅝"	12½"	3⅝"
34'-0"	15'-0"	18"	16½"	17'-0"	6"	4¾"	2¾"	1⅝"	3⅜"	4½"	2¼"	3⅝"	12½"	3⅝"
36'-0"	16'-0"	20"	18½"	18'-0"	6"	4¾"	2¾"	1⅝"	3⅜"	4¾"	2⅜"	3⅝"	14½"	3⅝"
38'-0"	17'-0"	20"	18½"	19'-0"	6½"	5¼"	3¼"	1⅝"	3⅜"	4¾"	2⅜"	3⅝"	14½"	3⅝"
40'-0"	18'-0"	20"	18½"	20'-0"	6½"	5¼"	3¼"	1⅝"	3⅜"	4¾"	2⅜"	3⅝"	14½"	3⅝"

750-CA

Standard Crank Operated—Mounted on Face of Wall

TYPE 800-CR

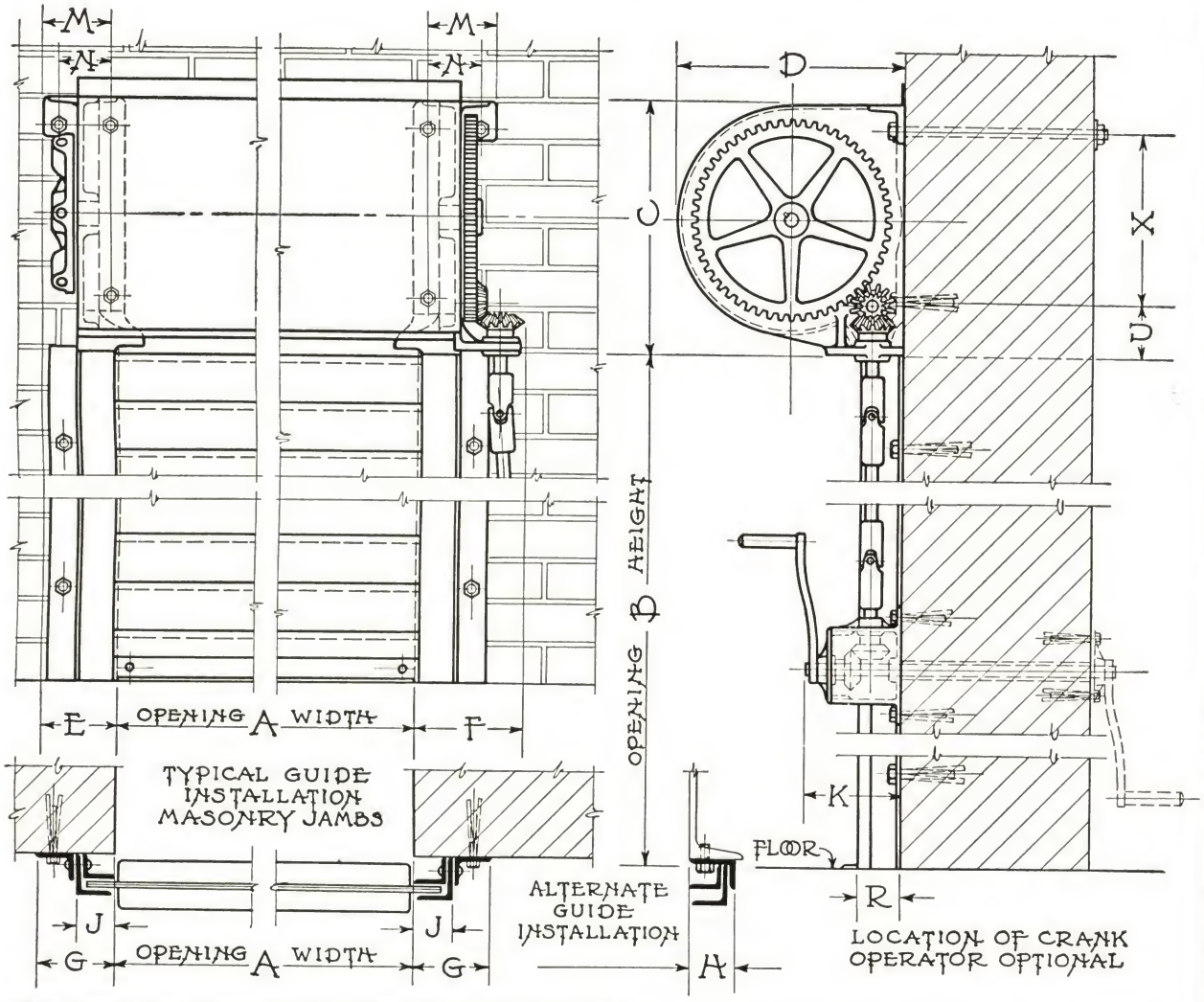


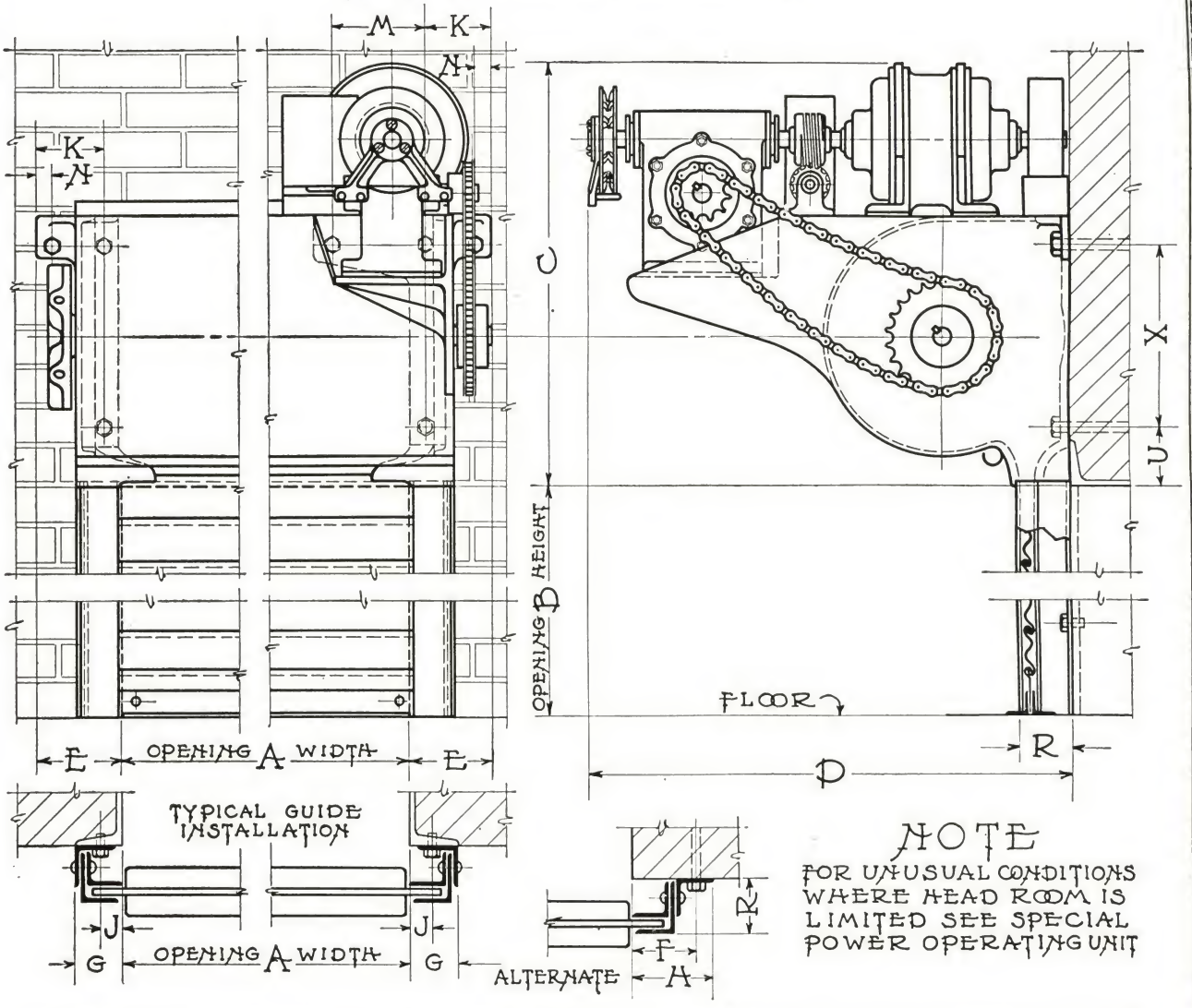
TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
6'-0"	8'-0"	16"	14½"	5½"	6½"	4¼"	2½"	2¼"	6½"	5"	3⅜"	3⅝"	10½"	2⅞"
7'-0"	9'-0"	16"	14½"	5½"	6½"	4¼"	2½"	2¼"	6½"	5"	3⅜"	3⅝"	10½"	2⅞"
8'-0"	10'-0"	16"	14½"	5½"	6½"	4¼"	2½"	2¼"	6½"	5"	3⅜"	3⅝"	10½"	2⅞"
9'-0"	11'-0"	16"	14½"	5½"	6½"	4¼"	2½"	2¼"	6½"	5"	3⅜"	3⅝"	10½"	2⅞"
10'-0"	12'-0"	16"	14½"	5½"	6½"	4¼"	2½"	2¼"	6½"	5"	3⅜"	3⅝"	10½"	2⅞"
11'-0"	13'-0"	18"	16½"	5½"	6½"	4¼"	2½"	2¼"	6½"	5"	3⅜"	3⅝"	12½"	3⅝"
12'-0"	14'-0"	18"	16½"	5½"	6½"	4¼"	2½"	2¼"	6½"	5"	3⅜"	3⅝"	12½"	3⅝"
13'-0"	15'-0"	18"	16½"	6"	7"	4¾"	3"	2¾"	6½"	5"	3⅜"	3⅝"	12½"	3⅝"
14'-0"	16'-0"	20"	18½"	6"	7"	4¾"	3"	2¾"	6½"	5"	3⅜"	3⅝"	14½"	3⅝"
15'-0"	17'-0"	20"	18½"	6"	7"	4¾"	3"	2¾"	6½"	5"	3⅜"	3⅝"	14½"	3⅝"
16'-0"	18'-0"	20"	18½"	6"	7"	4¾"	3"	2¾"	6½"	5"	3⅜"	3⅝"	14½"	3⅝"

800-CR

Standard Power Operated—Mounted on Face of Wall

TYPE 900-P



NOTE

FOR UNUSUAL CONDITIONS WHERE HEAD ROOM IS LIMITED SEE SPECIAL POWER OPERATING UNIT

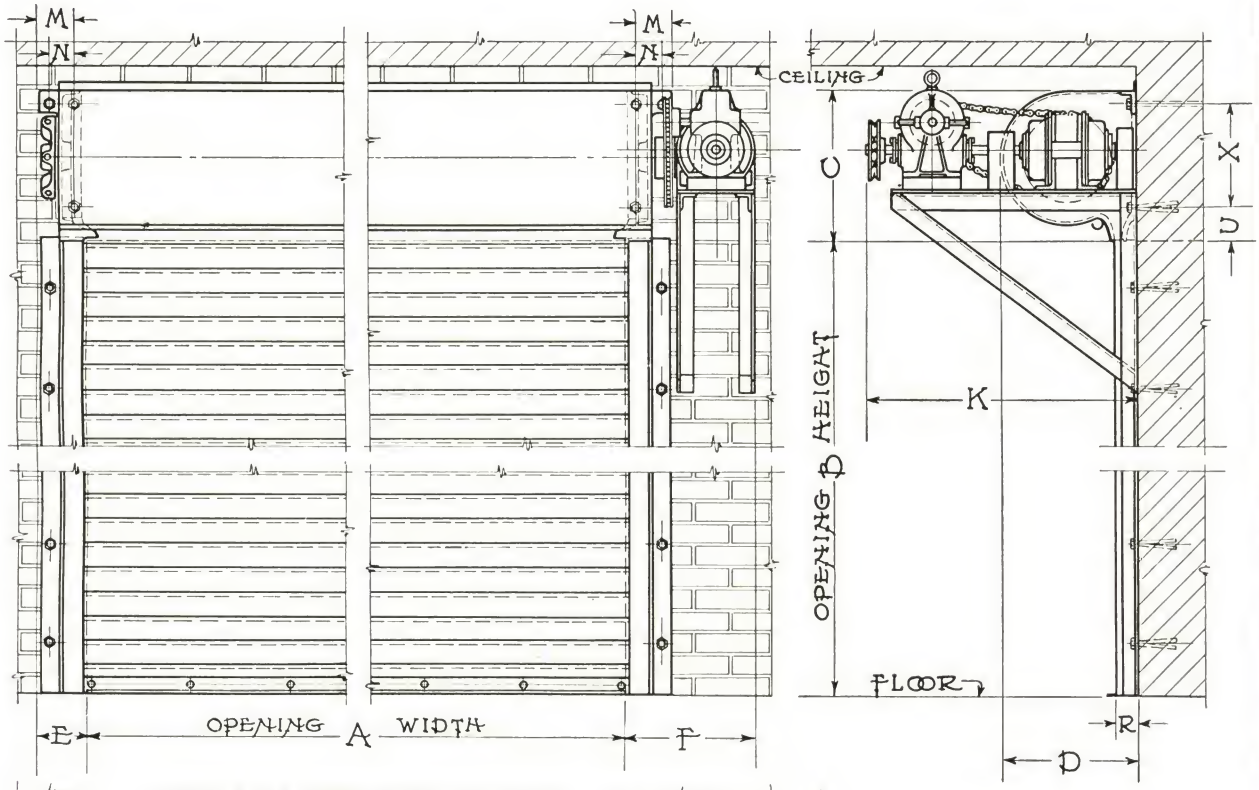
TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

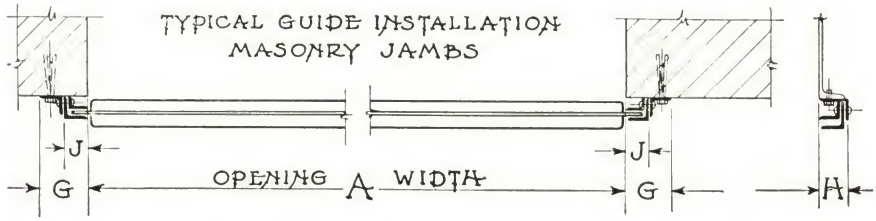
A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
10'-0"	10'-0"	2'-4½"	2'-9"	5½"	3½"	2½"	4¼"	1⅛"	5"	6⅛"	1⅝"	3⅝"	10½"	2⅞"
11'-0"	10'-6"	2'-4½"	2'-9"	5½"	3½"	2½"	4¼"	1⅛"	5"	6⅛"	1⅝"	3⅝"	10½"	2⅞"
12'-0"	11'-0"	2'-4½"	2'-9"	5½"	3½"	2½"	4¼"	1⅛"	5"	6⅛"	1⅝"	3⅝"	10½"	2⅞"
13'-0"	11'-6"	2'-4½"	2'-9"	6"	4"	3"	4¾"	1⅛"	5"	6⅛"	1⅝"	3⅝"	10½"	2⅞"
14'-0"	12'-0"	2'-4½"	2'-9"	6"	4"	3"	4¾"	1⅛"	5"	6⅛"	1⅝"	3⅝"	10½"	2⅞"
15'-0"	12'-6"	2'-6"	3'-0"	6"	4"	3"	4¾"	1⅛"	5"	6⅛"	1⅝"	3⅝"	12½"	3⅝"
16'-0"	13'-0"	2'-6"	3'-0"	6"	4"	3"	4¾"	1⅛"	5"	6⅛"	1⅝"	3⅝"	12½"	3⅝"
17'-0"	13'-6"	2'-6"	3'-0"	6"	4"	3"	4¾"	1⅛"	5"	6⅛"	1⅝"	3⅝"	12½"	3⅝"
18'-0"	14'-0"	2'-6"	3'-0"	6"	4"	3"	4¾"	1⅛"	5"	6⅛"	1⅝"	3⅝"	12½"	3⅝"
19'-0"	14'-6"	2'-6"	3'-0"	6½"	4½"	3½"	5¼"	1⅛"	5"	6⅛"	1⅝"	3⅝"	12½"	3⅝"
20'-0"	15'-0"	2'-6"	3'-0"	6½"	4½"	3½"	5¼"	1⅛"	5"	6⅛"	1⅝"	3⅝"	12½"	3⅝"

900-P

Standard Door with Special Power Operating Unit

TYPE 950-P





NOTE

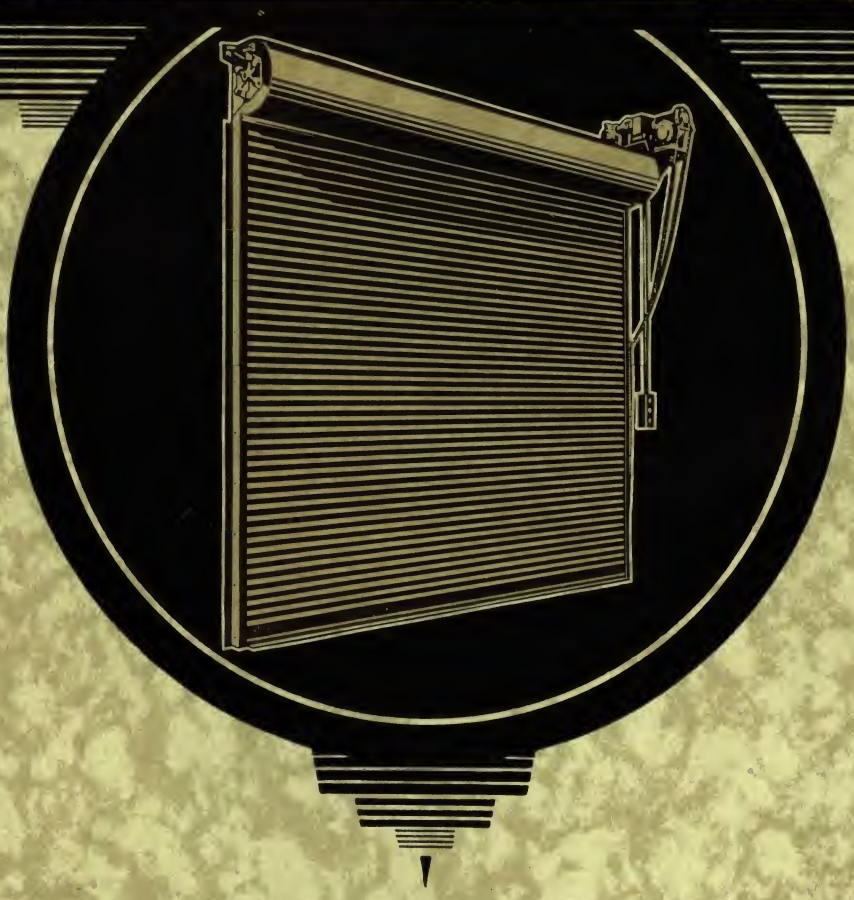
LOCATION OF OPERATOR IS VARIABLE UP OR DOWN TO MEET UNUSUAL CONDITIONS WHERE HEAD ROOM IS LIMITED

TABLE OF DIMENSIONS FOR VARIOUS OPENING SIZES

A	B	C	D	E	F	G	H	J	K	M	N	U	X	R
10'-0"	10'-0"	16"	14½"	5½"	14"	4¼"	2½"	2¼"	2'-6"	5"	3⅜"	3⅝"	10½"	2⅞"
12'-0"	11'-0"	16"	14½"	5½"	14"	4¼"	2½"	2¼"	2'-6"	5"	3⅜"	3⅝"	10½"	2⅞"
14'-0"	12'-0"	16"	14½"	6"	14½"	4¾"	3"	2¾"	2'-6"	5"	3⅜"	3⅝"	10½"	2⅞"
16'-0"	13'-0"	18"	16½"	6"	14½"	4¾"	3"	2¾"	2'-6"	5"	3⅜"	3⅝"	12½	3⅝"
18'-0"	14'-0"	18"	16½"	6"	17½"	4¾"	3"	2¾"	3'-0"	5"	3⅜"	3⅝"	12½"	3⅝"
20'-0"	15'-0"	18"	16½"	6½"	18"	5¼"	3½"	3¼"	3'-0"	5"	3⅜"	3⅝"	12½"	3⅝"
22'-0"	16'-0"	20"	18½"	6½"	18"	5¼"	3½"	3¼"	3'-0"	5"	3⅜"	3⅝"	14½"	3⅝"
24'-0"	17'-0"	20"	18½"	6½"	21"	5¼"	3½"	3¼"	3'-2"	5"	3⅜"	3⅝"	14½"	3⅝"
26'-0"	18'-0"	20"	18½"	7"	21½"	5¾"	4"	3¾"	3'-2"	5"	3⅜"	3⅝"	14½"	3⅝"
28'-0"	19'-0"	20"	18½"	7"	21½"	5¾"	4"	3¾"	3'-2"	5"	3⅜"	3⅝"	14½"	3⅝"
30'-0"	20'-0"	20"	18½"	7"	21½"	5¾"	4"	3¾"	3'-2"	5"	3⅜"	3⅝"	14½"	3⅝"

950-P

MAHON
ROLLING
STEEL DOORS



THE R. C. MAHON COMPANY
DETROIT, MICHIGAN

THE KINNEAR MANUFACTURING CO.

Exclusively Door Manufacturers

820-870 Field Avenue
COLUMBUS, OHIO

BRANCH OFFICES

BOSTON, MASS., 294 Washington Street
NEW YORK, N. Y., 342 Madison Avenue
PHILADELPHIA, PA., 503 Wesley Building
WASHINGTON, D. C., 1040 Investment Building
PITTSBURGH, PA., 601 Oliver Building
NEW ORLEANS, LA., 730 Hibernia Bank Building
CLEVELAND, OHIO, 528 Union Building
CINCINNATI, OHIO, 528 Walnut Street
DETROIT, MICH., 812 Ford Building
CHICAGO, ILL., 128 Wells Street
KANSAS CITY, MO., 111 Railway Exchange
SAN FRANCISCO, CAL., 444 Market Street

AGENTS IN PRINCIPAL CITIES

Products

STEEL, BRONZE or ALUMINUM ROLLING DOORS and SHUTTERS for service purposes.

STEEL ROLLING FIRE DOORS and SHUTTERS.

WOOD ROLLING INTERIOR PARTITIONS.

STEEL BIFOLDING DOORS.

WOOD ROLLING DOORS for roundhouses.

WOOD BIFOLDING DOORS.

VERTICAL SLIDING DOORS.

"ROL-TOP" GARAGE DOORS.

KINNEAR ROLLING DOORS

TRADE-MARK

Types

Kinnear steel rolling doors and shutters are manufactured and sold under two distinct classifications, viz., Service and Labeled Types. Service doors are designed entirely for such openings as do not require Underwriters' label and where insurance rates are not a consideration.

Construction of Steel Rolling Doors

Kinnear steel rolling doors are constructed of the highest class of materials by expert door builders, mechanics especially trained in the exclusive manufacture of doors.

The curtain proper on all Kinnear doors is made of open hearth interlocking steel slats, galvanized and equipped with malleable iron endlocks. This curtain is coiled upon a barrel journalled in heavy cast iron brackets and it travels in steel guides mounted at sides of openings.

The curtain is counterbalanced by means of helical springs which are enclosed in the barrel.

A galvanized steel hood of suitable design is supplied with each door.

Installation of Rolling Doors

Doors in general are mounted on face of wall with brackets and coil entirely above the bottom of lintel and with edges of guides flush with face of opening jambs.

Where headroom is limited and door can not be installed on face of wall, it can be mounted in the opening, in which case the brackets and coil would be placed directly under the lintel and guides would be located on the jambs or in reveals provided in the jambs.

Operation of Rolling Doors

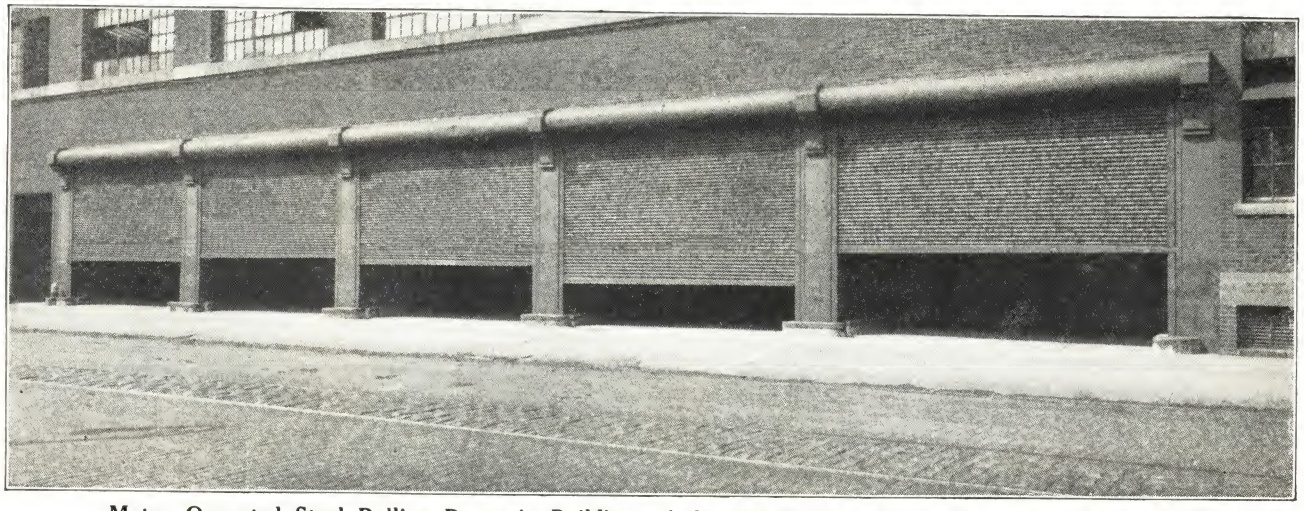
The methods of operation most commonly used are:

Push-up—Manually opened and closed by means of handles in bottom plate. (Not recommended for doors exceeding 80 sq. ft. in area.)

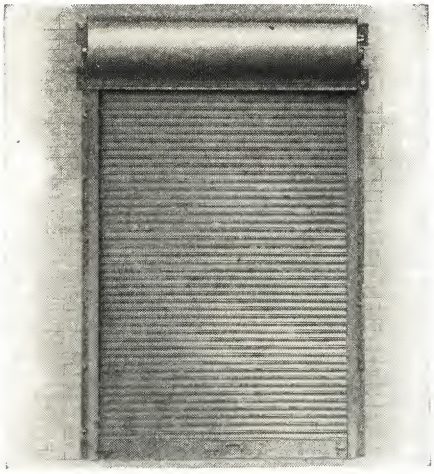
Chain—Mechanically operated by hand chain, sprocket and reduction gear.

Crank—Mechanically operated by hand crank, shafting and reduction gear.

Power—Driven by electric motor, controlled by one or more push button stations conveniently located. (Refer to page 9 for illustrations and description of Kinnear Power Unit.)



Motor Operated Steel Rolling Doors in Building of the 399 Hudson Street Corp., New York, N. Y.



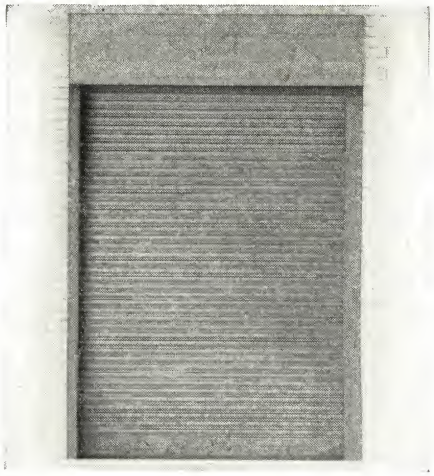
Elevation

Vertical Section

Cross Section

F.M. 10. Construction

Mounted on face of wall
Push-up hand lift type, spring counterbalanced.
May be opened or closed from either side.
Provided with locking device.



Elevation

Vertical Section

Cross Section

B.M. 10. Construction

Mounted in opening.
Push-up hand lift type, spring counterbalanced.
May be opened or closed from either side. Provided with locking device.
Paneled hoods can be furnished at small additional cost.

Push-up hand lift types are not recommended for doors exceeding 80 sq. ft. in area. Refer to page 5 for clearance dimensions

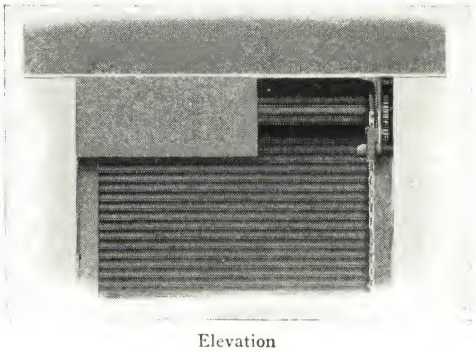
Elevation

End View

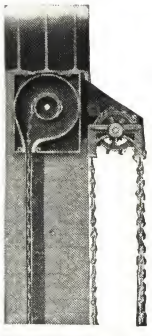
Cross Section

F.H. 20. Construction

Mounted on face of wall; counterbalanced by springs.
Operated by hand chain, sprocket and gear.
Means provided for locking chain



Elevation



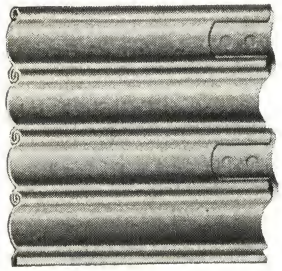
Vertical Section

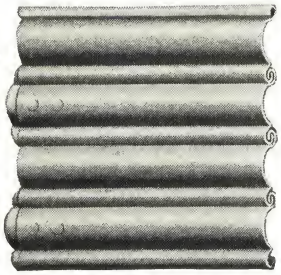
Cross Section

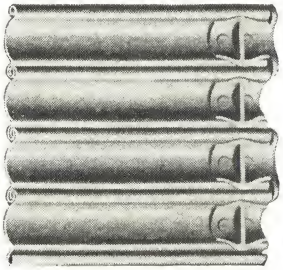
B.H. 20. Construction

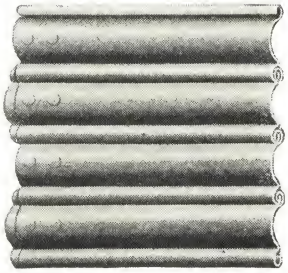
Mounted in opening; counterbalanced by springs
Operated by hand chain, sprocket and gear
Means provided for locking chain.

Refer to page 4 for clearance dimensions





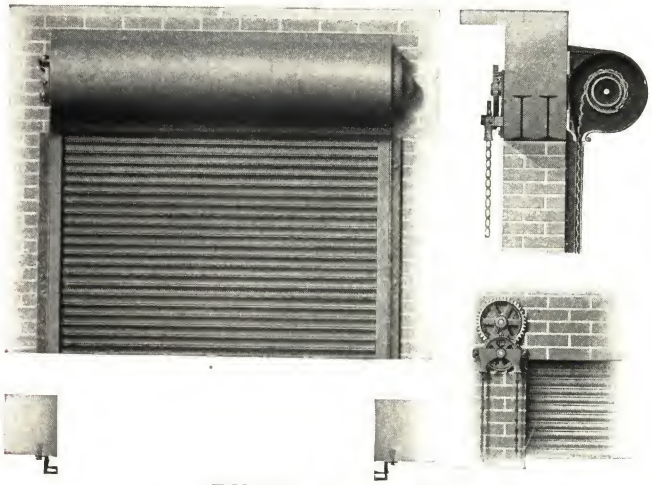




Concave and Convex Sides of Interlocking Steel Slat No. 2

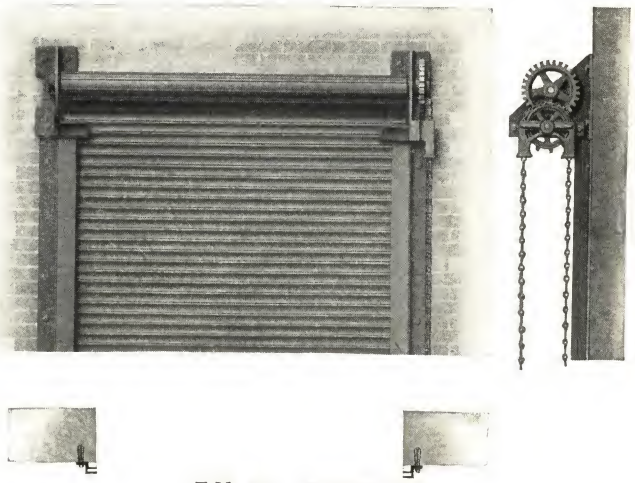
Illustrations to the left show slat fitted with alternate end locks; those to the right, fitted with continuous endlocks. Slat No. 2 is 1¾ in. wide on centers; depth of crown, ½ in. Made in Nos. 24, 22, 20, 18 and 16 U. S. gauges.

Slat No. 4 is 2⅝ in. wide on centers; depth of crown, ⅞ in. Made in Nos. 22, 20, 18 and 16 U. S. gauges.



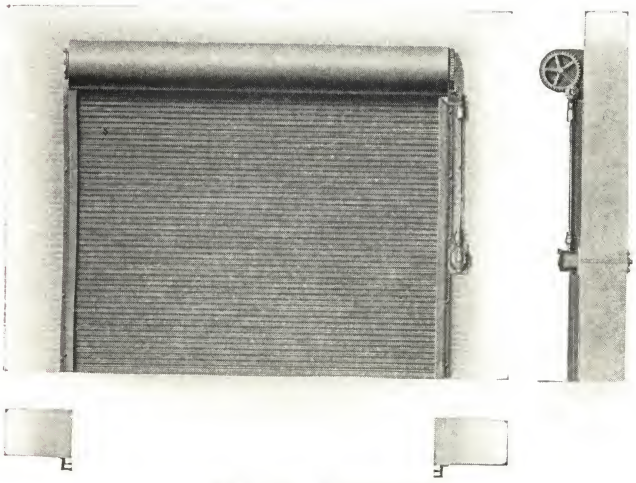
F.H. 61. Construction

Door mounted on exterior face of wall. Operated from within building by hand chain, sprocket and gears on shaft extending through the wall. Means provided for locking chain



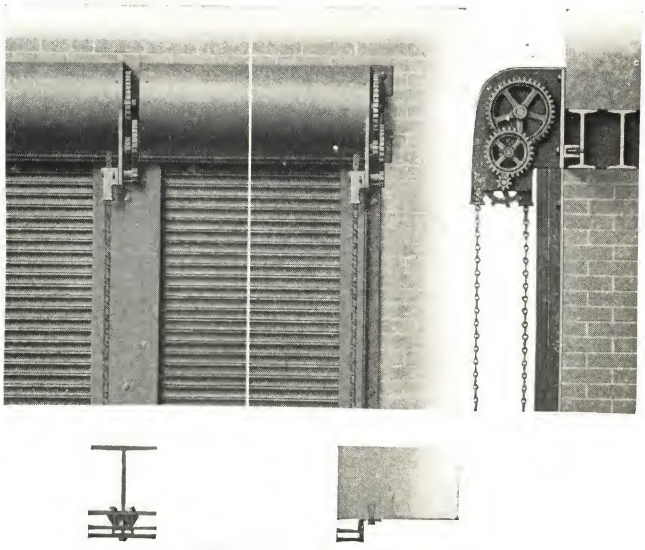
F.H. 30. Construction

This construction for inside mounting only, is essentially the same as F.H. 20 (see page 2) except enclosing hood is omitted, effecting a slight saving in cost



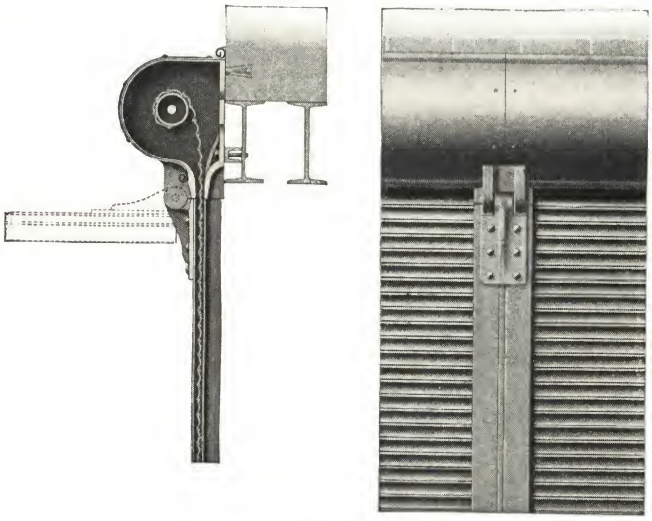
F.C. 20. Construction

Mounted on face of wall. Operation by hand crank, shafting and gear. Standard equipment provides for operation on door side of wall only. At a small additional cost door can be made to operate from both sides of wall or only from the side of wall opposite door. Refer to page 5 for clearance dimensions



F.H. 23. Construction

A compact design especially applicable to buildings requiring a row of contiguous doors. Doors of this construction are operated by hand chain, sprocket and gear



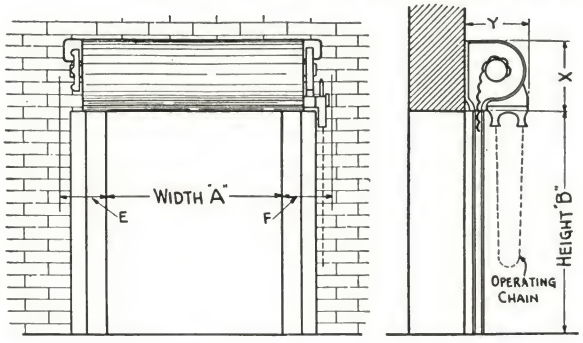
Intermediate Movable Posts

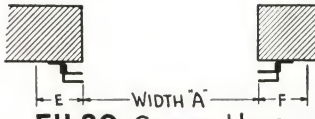
Wide openings can frequently be closed more economically with a number of small doors, than by a single large door, using, between doors, movable posts hinged to door brackets. After doors are open, posts are swung up out of the way by ropes and pulleys

Interior of Pier 32, San Francisco

Steel rolling doors arranged with movable intermediate side rolling posts, making entire opening available

STEEL ROLLING – SERVICE DOORS – NOT AUTOMATIC

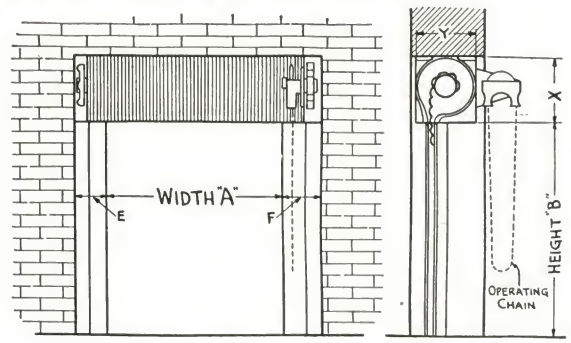


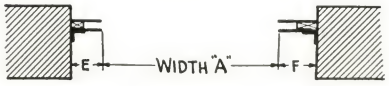


FH-20 CHAIN HOIST OPERATION

HEIGHT B-FEET		WIDTH A - FEET																	
		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
8	X	12"	12"	12"	12"	12"	12"	13"	14"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"
	Y	13"	13"	13"	13"	13"	13"	14"	14"	17"	17"	17"	15"	15"	15"	15"	15"	15"	15"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	7"	7"	7"	7"	7"	7"	8"	8"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
9	X	13"	13"	13"	13"	13"	13"	13"	14"	16"	16"	16"	17"	17"	17"	17"	17"	17"	17"
	Y	13"	13"	13"	13"	13"	13"	14"	16"	18"	18"	18"	16"	16"	16"	16"	16"	16"	16"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	9"
10	X	13"	13"	13"	13"	13"	13"	13"	14"	17"	17"	17"	17"	17"	17"	17"	17"	17"	17"
	Y	13"	13"	13"	14"	14"	14"	14"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"
	E	6"	6"	7"	6"	6"	6"	7"	7"	7"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	7"	7"	7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	8"	8"	8"	8"	8"	9"
11	X	14"	14"	14"	14"	14"	14"	14"	15"	17"	17"	18"	18"	18"	18"	19"	19"	19"	19"
	Y	13"	13"	13"	14"	15"	16"	16"	17"	17"	17"	19"	19"	19"	19"	19"	19"	19"	19"
	E	6"	6"	7"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	8"	8"
	F	7"	7"	7"	7"	7"	7"	8"	8"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
12	X	15"	15"	15"	15"	15"	15"	15"	15"	17"	17"	18"	18"	18"	18"	18"	21"	21"	21"
	Y	15"	15"	15"	15"	15"	15"	17"	17"	17"	17"	18"	19"	19"	19"	19"	19"	19"	19"
	E	6"	7"	6"	7"	6"	7"	7"	7"	6"	7"	7"	7"	8"	8"	8"	7"	7"	8"
	F	7"	7"	7"	7"	7"	7"	7"	8"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
13	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	19"	19"	19"	21"	21"	21"	21"	21"
	Y	17"	17"	17"	17"	17"	17"	17"	15"	18"	18"	18"	18"	18"	19"	19"	19"	19"	19"
	E	6"	7"	6"	7"	6"	7"	7"	7"	6"	7"	8"	7"	8"	7"	7"	7"	7"	8"
	F	7"	7"	7"	7"	7"	7"	8"	8"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
14	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	19"	19"	19"	21"	21"	21"	21"	21"
	Y	17"	17"	17"	17"	17"	17"	18"	15"	18"	18"	18"	18"	19"	19"	19"	19"	20"	20"
	E	6"	7"	6"	7"	6"	7"	7"	7"	6"	7"	8"	7"	8"	7"	7"	7"	7"	8"
	F	7"	7"	7"	7"	7"	7"	8"	8"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
15	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	19"	21"	21"	21"	21"	21"	21"	21"
	Y	17"	17"	17"	17"	17"	18"	15"	17"	18"	18"	18"	20"	20"	20"	24"	24"	24"	24"
	E	6"	7"	6"	7"	7"	6"	7"	8"	6"	7"	8"	7"	8"	8"	10"	10"	10"	11"
	F	7"	7"	7"	7"	7"	7"	8"	8"	7"	8"	8"	8"	8"	8"	16"	16"	16"	16"
16	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	21"	21"	21"	21"	21"	24"	24"	24"
	Y	17"	17"	17"	17"	18"	15"	15"	15"	18"	18"	20"	20"	20"	20"	24"	26"	26"	26"
	E	6"	7"	7"	7"	6"	7"	7"	8"	6"	7"	7"	7"	7"	8"	10"	10"	10"	11"
	F	7"				7"		8"	8"	7"	8"	8"	8"	8"	8"	16"	16"	16"	16"
17	X					17"	17"	17"	17"	21"	21"	21"	21"	21"	21"	24"	24"	24"	24"
	Y					17"	17"	17"	18"	19"	20"	20"	20"	20"	20"	26"	26"	26"	26"
	E					6"	7"	7"	7"	6"	7"	8"	7"	8"	8"	10"	10"	10"	11"
	F					7"			8"	7"	8"	8"	8"	8"	8"	16"	16"	16"	16"
18	X					21"	21"	21"	21"	21"	21"	21"	21"	21"	21"	24"	24"	24"	24"
	Y					19"	19"	19"	19"	19"	20"	20"	20"	20"	20"	26"	26"	26"	26"
	E					6"	6"	6"	6"	6"	7"	7"	7"	7"	7"	10"	10"	10"	11"
	F					7"	7"	7"	7"	7"	8"	8"	8"	8"	8"	16"	16"	16"	16"
19	X					21"	21"	21"	21"	21"	21"	21"	24"	24"	24"	24"	24"	24"	24"
	Y					20"	20"	20"	20"	20"	20"	20"	22"	22"	26"	26"	26"	26"	26"
	E					6"	6"	7"	7"	6"	7"	7"	8"	9"	9"	10"	10"	10"	11"
	F					7"	7"		7"	7"	8"	8"	8"	9"	9"	16"	16"	16"	16"
20	X					21"	21"	21"	21"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"
	Y					20"	20"	20"	22"	22"	22"	22"	22"	22"	26"	26"	26"	26"	26"
	E					6"	6"	7"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					7"	7"		8"	8"	8"	8"	8"	9"	9"	16"	16"	16"	16"
21	X					21"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"	26"
	Y					20"	22"	22"	22"	22"	22"	22"	22"	22"	26"	26"	26"	26"	27"
	E					6"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					7"	8"	8"	8"	8"	8"	8"	8"	9"	9"	16"	16"	16"	16"
22	X					24"	24"	24"	24"	24"	24"	24"	26"	26"	26"	26"	26"	27"	27"
	Y					22"	22"	22"	22"	22"	22"	22"	23"	23"	27"	27"	27"	28"	28"
	E					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	16"	16"	16"	16"
23	X					24"	24"	24"	24"	24"	24"	26"	26"	26"	26"	27"	27"	27"	27"
	Y					22"	22"	22"	22"	22"	23"	23"	23"	23"	27"	28"	28"	28"	28"
	E					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	16"	16"	16"	16"
24	X					26"	26"	26"	26"	26"	26"	26"	26"	26"	26"	27"	27"	27"	27"
	Y					23"	23"	23"	23"	23"	23"	23"	23"	23"	27"	28"	28"	28"	28"
	E					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	16"	16"	16"	16"

FOR DOORS OF INTERMEDIATE SIZES, USE CLEARANCE DIMENSIONS LISTED FOR NEXT LARGER WIDTH OR HEIGHT.



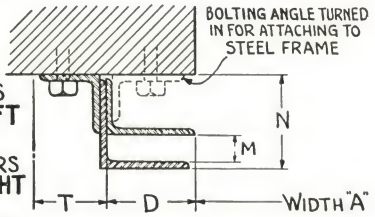


BH-20 CHAIN HOIST OPERATION

HEIGHT B-FEET		WIDTH A - FEET																	
		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
8	X	13"	13"	13"	13"	13"	13"	14"	14"	16"	16"	16"	17"	17"	17"	17"	17"	17"	17"
	Y	10"	10"	10"	10"	10"	10"	11"	12"	13"	14"	14"	14"	14"	14"	14"	15"	15"	15"
	E	4"	4"	5"	5"	5"	5"	5"	5"	5"	5"	5"	6"	6"	6"	6"	6"	6"	7"
	F	5"	5"	5"	6"	6"	6"	6"	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"	9"
9	X	14"	14"	14"	14"	14"	14"	14"	16"	16"	17"	17"	18"	18"	18"	18"	18"	18"	18"
	Y	11"	11"	11"	11"	11"	11"	11"	12"	14"	14"	14"	15"	15"	15"	15"	15"	15"	15"
	E	4"	4"	5"	5"	5"	5"	5"	5"	5"	5"	5"	6"	6"	6"	6"	6"	6"	7"
	F	5"	5"	6"	6"	6"	6"	6"	6"	6"	6"	6"	8"	8"	8"	8"	8"	8"	9"
10	X	14"	14"	14"	14"	14"	14"	14"	16"	18"	18"	18"	18"	18"	18"	18"	18"	18"	18"
	Y	11"	11"	11"	11"	11"	11"	11"	12"	15"	15"	15"	15"	15"	15"	15"	15"	15"	15"
	E	4"	4"	5"	5"	5"	5"	5"	5"	5"	6"	6"	6"	6"	6"	6"	6"	6"	7"
	F	5"	5"	6"	6"	6"	6"	6"	6"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
11	X	14"	14"	16"	16"	16"	16"	16"	16"	19"	19"	19"	19"	19"	19"	19"	20"	20"	20"
	Y	12"	12"	12"	12"	12"	12"	12"	13"	16"	16"	16"	16"	16"	16"	16"	16"	18"	18"
	E	4"	5"	5"	5"	5"	5"	5"	5"	5"	6"	6"	6"	6"	6"	6"	6"	6"	7"
	F	5"	5"	6"	6"	6"	6"	6"	6"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
12	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	19"	19"	19"	19"	19"	22"	22"	22"
	Y	13"	14"	13"	13"	13"	13"	13"	13"	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"
	E	4"	4"	5"	5"	5"	5"	5"	5"	5"	6"	6"	6"	6"	6"	6"	6"	6"	7"
	F	5"	5"	6"	6"	6"	6"	6"	6"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
13	X	17"	17"	17"	17"	17"	17"	17"	17"	19"	19"	19"	19"	19"	19"	22"	22"	22"	22"
	Y	14"	14"	14"	14"	14"	14"	14"	14"	16"	16"	16"	16"	16"	16"	19"	19"	19"	19"
	E	4"	4"	5"	5"	5"	5"	5"	6"	5"	6"	6"	6"	6"	6"	6"	6"	6"	7"
	F	5"	5"	6"	6"	6"	6"	6"	8"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
14	X	17"	17"	17"	17"	17"	17"	17"	17"	19"	19"	19"	19"	19"	19"	22"	22"	23"	23"
	Y	14"	14"	14"	14"	14"	14"	14"	14"	17"	17"	17"	17"	17"	17"	19"	20"	20"	20"
	E	4"	4"	5"	5"	5"	5"	5"	6"	5"	6"	6"	6"	6"	6"	6"	6"	6"	7"
	F	5"	5"	6"	6"	6"	6"	6"	8"	7"	8"	8"	8"	8"	8"	8"	8"	8"	9"
15	X	17"	17"	17"	17"	17"	17"	17"	17"	19"	19"	19"	19"	19"	22"	22"			
	Y	14"	14"	14"	14"	14"	14"	14"	15"	17"	17"	17"	17"	19"	19"	19"			
	E	4"	4"	5"	5"	5"	5"	5"	6"	5"	6"	6"	6"	6"	6"	6"			
	F	5"	5"	6"	6"	6"	6"	6"	8"	7"	8"	8"	8"	8"	8"	8"			
16	X	17"	17"	17"	17"	17"	17"	17"	18"	20"	20"	22"	22"	22"					
	Y	15"	15"	15"	15"	15"	15"	15"	15"	18"	18"	19"	19"	19"					
	E	4"	5"	5"	5"	5"	5"	5"	6"	5"	6"	6"	6"	6"					
	F	5"	5"	6"	6"	6"	6"	6"	8"	7"	8"	8"	8"	8"					

–CURTAIN SLATS–

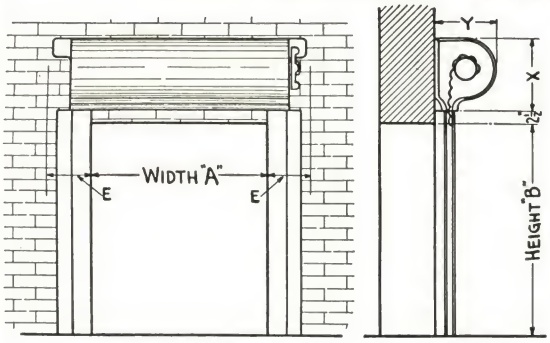
SLAT Nº. 2 USED ON DOORS OF SIZES LISTED TO LEFT OF HEAVY LINE.
SLAT Nº. 4 USED ON DOORS OF SIZES LISTED TO RIGHT OF HEAVY LINE.

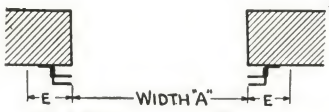


SCHEDULE OF CLEARANCES FOR TYPICAL CURTAIN GUIDE

	Width-A	D	M	N	T
Slat No. 2	to 7'-0" incl	2"	7/8"	3 1/2"	2 1/2"
	Over 7'-0" to 11'-0" "	2 1/2"	7/8"	3 1/2"	2 1/2"
	" 11'-0" to 14'-0" "	3"	7/8"	3 1/2"	2 1/2"
Slat No. 4	to 14'-0" incl.	2 1/2"	1 1/8"	5"	2 1/2"
	Over 14'-0" to 17'-0" "	3"	1 1/8"	5"	2 1/2"
	" 17'-0" to 22'-0" "	3 1/2"	1 1/8"	5"	2 1/2"
	" 22'-0" to 24'-0" "	4"	1 1/8"	5"	3"
	" 24'-0" to 32'-0" "	6"	1 5/8"	6"	4"
	" 32'-0" to 40'-0" "	8"	1 5/8"	6"	4"

STEEL ROLLING – SERVICE DOORS – NOT AUTOMATIC

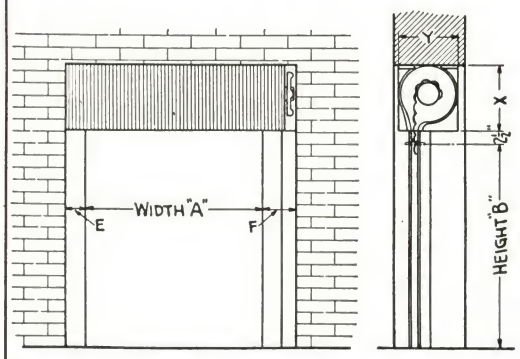


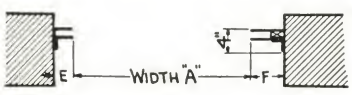


*NOT RECOMMENDED FOR SIZES EXCEEDING 80 SQUARE FEET IN AREA.

FM-10 PUSH-UP*(HAND LIFT) №2 SLAT CURTAIN

HEIGHT B-FEET		WIDTH A-FEET 3	4	5	6	7	8	9	10	11	12
6	X	13"	13"	13"	13"	13"	13"	13"	13"	13"	13"
	Y	12"	6"	12"	6"	6"	12"	6"	6"	12"	12"
	E	6"	6"	6"	6"	6"	6"	6"	6"	6"	7"
7	X	14"	14"	14"	14"	14"	14"	16"	16"	16"	16"
	Y	13"	6"	13"	6"	13"	6"	15"	15"	15"	15"
	E	6"	6"	6"	6"	6"	6"	6"	6"	6"	7"
8	X	14"	14"	14"	16"	16"	16"	18"	18"	18"	18"
	Y	13"	6"	13"	15"	15"	15"	17"	17"	17"	17"
	E	6"	6"	6"	6"	6"	6"	6"	6"	6"	7"
9	X	17"	17"	17"	17"	17"	19"	19"	19"	19"	19"
	Y	16"	6"	16"	6"	16"	18"	18"	18"	18"	18"
	E	6"	6"	6"	6"	6"	6"	6"	6"	6"	7"
10	X	17"	17"	17"	17"	19"	19"	19"	19"		
	Y	16"	6"	16"	6"	18"	18"	18"	18"		
	E	6"	6"	6"	6"	6"	6"	6"	6"		
11	X	17"	17"	17"	19"	19"	19"				
	Y	16"	6"	16"	18"	18"	18"				
	E	6"	6"	6"	6"	6"	6"				
12	X	18"	18"	19"	19"	19"					
	Y	17"	6"	18"	18"	18"					
	E	6"	6"	6"	6"	6"					



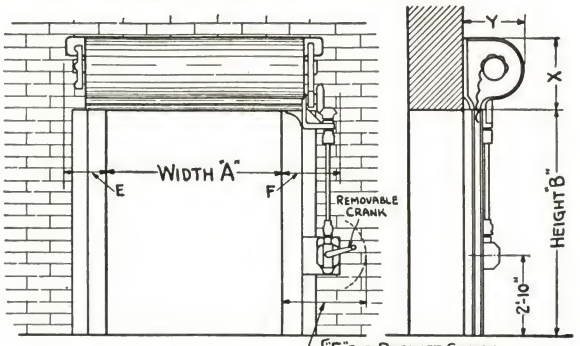


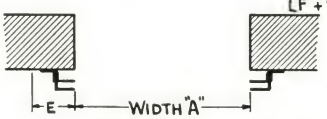
*NOT RECOMMENDED FOR SIZES EXCEEDING 80 SQUARE FEET IN AREA.

BM-10 PUSH-UP*(HAND LIFT) №2 SLAT CURTAIN

HEIGHT B-FEET		WIDTH A-FEET 3	4	5	6	7	8	9	10	11	12
6	X	14"	14"	14"	14"	14"	14"	14"	14"	14"	14"
	Y	11"	11"	11"	11"	11"	11"	11"	11"	11"	11"
	E	3"	3"	3"	3"	3"	3"	3"	3"	3"	4"
	F	4"	4"	4"	4"	4"	4"	5"	5"	5"	5"
7	X	15"	15"	15"	15"	15"	15"	17"	17"	17"	17"
	Y	13"	13"	13"	13"	13"	13"	14"	14"	14"	14"
	E	3"	4"	3"	4"	3"	4"	3"	3"	4"	4"
	F	4"	4"	4"	4"	4"	4"	5"	5"	5"	5"
8	X	15"	15"	15"	17"	17"	17"	18"	18"	18"	18"
	Y	13"	13"	13"	14"	14"	14"	16"	16"	16"	16"
	E	3"	4"	3"	4"	4"	4"	3"	5"	5"	5"
	F	4"	4"	4"	4"	4"	4"	5"	5"	5"	5"
9	X	17"	17"	17"	17"	17"	19"	19"	19"	19"	19"
	Y	15"	15"	15"	15"	15"	17"	17"	17"	17"	17"
	E	3"	4"	3"	4"	4"	4"	3"	5"	5"	5"
	F	4"	4"	4"	4"	4"	4"	5"	5"	5"	5"
10	X	18"	18"	18"	18"	19"	19"	19"	19"	19"	19"
	Y	16"	16"	16"	16"	17"	17"	17"	17"	17"	17"
	E	3"	4"	3"	4"	4"	4"	3"	5"	5"	5"
	F	4"	4"	4"	4"	4"	4"	5"	5"	5"	5"
11	X	18"	18"	18"	20"	20"	20"	20"	20"	20"	20"
	Y	16"	16"	16"	18"	18"	18"	18"	18"	18"	18"
	E	3"	4"	4"	4"	4"	4"	3"	5"	5"	5"
	F	4"	4"	4"	4"	4"	4"	5"	5"	5"	5"
12	X	18"	18"	18"	20"	20"	20"	20"	20"	20"	20"
	Y	16"	16"	16"	18"	18"	18"	18"	18"	18"	18"
	E	3"	4"	4"	4"	4"	4"	3"	5"	5"	5"
	F	4"	4"	4"	4"	4"	4"	5"	5"	5"	5"

FOR DOORS OF INTERMEDIATE SIZES, USE CLEARANCE DIMENSIONS LISTED FOR NEXT LARGER WIDTH OR HEIGHT.





FC-20 CRANK SHAFT OPERATION

HEIGHT B-FEET		WIDTH A-FEET 6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
8	X	12"	12"	12"	12"	12"	12"	13"	14"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"
	Y	11"	11"	11"	11"	11"	11"	12"	12"	14"	14"	14"	15"	15"	15"	15"	15"	15"	15"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	13"	13"	13"	14"
9	X	13"	13"	13"	13"	13"	13"	13"	14"	16"	16"	16"	17"	17"	17"	17"	17"	17"	17"
	Y	12"	12"	12"	12"	12"	12"	12"	13"	14"	14"	14"	16"	16"	16"	16"	16"	16"	16"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	13"	13"	13"	14"
10	X	13"	13"	13"	13"	13"	13"	13"	14"	17"	17"	17"	17"	17"	17"	17"	17"	17"	17"
	Y	12"	12"	12"	12"	12"	12"	12"	13"	16"	16"	16"	16"	16"	16"	16"	16"	16"	16"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	13"	13"	13"	14"
11	X	14"	14"	14"	14"	14"	14"	14"	15"	17"	17"	18"	18"	18"	18"	18"	19"	19"	19"
	Y	12"	12"	12"	12"	13"	13"	13"	14"	16"	16"	17"	17"	17"	17"	17"	18"	18"	18"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	13"	13"	13"	14"
12	X	15"	15"	15"	15"	15"	15"	15"	15"	17"	17"	18"	18"	18"	18"	18"	21"	21"	21"
	Y	14"	14"	14"	14"	14"	14"	14"	14"	16"	16"	17"	17"	17"	17"	17"	19"	19"	19"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	13"	13"	13"	14"
13	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	19"	19"	19"	21"	21"	21"	21"	21"
	Y	14"	14"	14"	14"	14"	14"	14"	15"	18"	18"	18"	18"	18"	19"	19"	19"	19"	19"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	13"	13"	13"	14"
14	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	19"	19"	19"	21"	21"	21"	21"	21"
	Y	14"	14"	14"	14"	14"	14"	14"	15"	18"	18"	18"	18"	18"	19"	19"	20"	20"	20"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	7"	7"	7"	8"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	13"	13"	13"	14"
15	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	19"	21"	21"	21"	21"	21"	21"	21"
	Y	15"	15"	15"	15"	15"	15"	15"	15"	18"	18"	18"	20"	20"	20"	20"	20"	20"	20"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	10"	10"	10"	11"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
16	X	16"	16"	16"	16"	16"	16"	16"	16"	19"	19"	21"	21"	21"	21"	21"	24"	24"	24"
	Y	15"	15"	15"	15"	15"	15"	15"	15"	18"	18"	20"	20"	20"	20"	20"	22"	22"	22"
	E	6"	6"	6"	6"	6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	10"	10"	10"	11"
	F	11"	11"	11"	11"	11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
17	X					17"	17"	17"	17"	21"	21"	21"	21"	21"	21"	24"	24"	24"	24"
	Y					16"	16"	16"	16"	19"	20"	20"	20"	20"	20"	22"	22"	22"	22"
	E					6"	6"	7"	7"	6"	7"	7"	7"	7"	7"	10"	10"	10"	11"
	F					11"	11"	12"	12"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
18	X					21"	21"	21"	21"	21"	21"	21"	21"	21"	21"	24"	24"	24"	24"
	Y					19"	19"	19"	19"	19"	20"	20"	20"	20"	20"	22"	22"	22"	22"
	E					6"	6"	6"	6"	6"	7"	7"	7"	7"	7"	10"	10"	10"	11"
	F					11"	11"	11"	11"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
19	X					21"	21"	21"	21"	21"	21"	21"	24"	24"	24"	24"	24"	24"	24"
	Y					20"	20"	20"	20"	20"	20"	20"	22"	22"	22"	22"	22"	22"	22"
	E					6"	6"	6"	6"	6"	7"	7"	8"	9"	9"	10"	10"	10"	11"
	F					11"	11"	11"	11"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
20	X					21"	21"	21"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"
	Y					20"	20"	20"	22"	22"	22"	22"	22"	22"	22"	22"	22"	22"	22"
	E					6"	6"	6"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					11"	11"	11"	11"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
21	X					21"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"	24"	26"
	Y					20"	22"	22"	22"	22"	22"	22"	22"	22"	22"	22"	22"	22"	24"
	E					6"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					11"	11"	11"	11"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
22	X					24"	24"	24"	24"	24"	24"	26"	26"	26"	26"	26"	26"	27"	27"
	Y					22"	22"	22"	22"	22"	22"	24"	24"	24"	24"	24"	24"	25"	25"
	E					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					11"	11"	11"	11"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
23	X					24"	24"	24"	24"	24"	26"	26"	26"	26"	26"	26"	27"	27"	27"
	Y					22"	22"	22"	22"	22"	24"	24"	24"	24"	24"	24"	25"	25"	25"
	E					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					11"	11"	11"	11"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"
24	X					26"	26"	26"	26"	26"	26"	26"	26"	26"	27"	27"	27"	27"	27"
	Y					24"	24"	24"	24"	24"	24"	24"	24"	24"	25"	25"	25"	25"	25"
	E					8"	8"	8"	8"	8"	8"	8"	8"	9"	9"	10"	10"	10"	11"
	F					11"	11"	11"	11"	11"	12"	12"	12"	13"	13"	16"	16"	16"	16"

FIRE DOORS AND SHUTTERS

Constructed Under the Supervision of the Underwriters' Laboratories, Inc., and Labeled as Below

Important Features

Kinnear fire doors and shutters are specially designed for fire protection.

Details of construction have been carefully developed. The following are some of the important features:

(1) An auxiliary or inner hood is automatically dropped and closes the space between the barrel and outer hood, thereby preventing the passage of flame over the barrel.

(2) Special endlocks closing the concaved ends of slats and preventing the passage of flame around the edge of the curtain.

(3) Fusible washers employed in the construction of grooves which melt and allow the members composing the grooves to expand without buckling.

(4) Non-corrodible metal used for bearings and contact points of the automatic release.

(5) Single line contact bearings in releasing levers.

(6) Provision made for expansion of parts for all temperatures up to 1800° F.

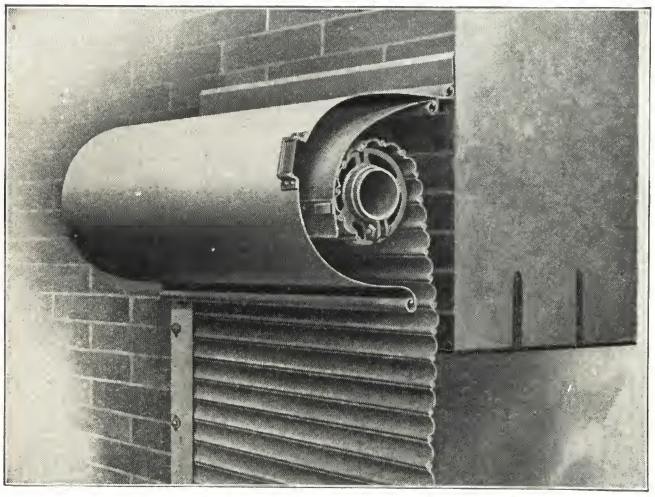
(7) Disposition of fusible links, insuring prompt closing.

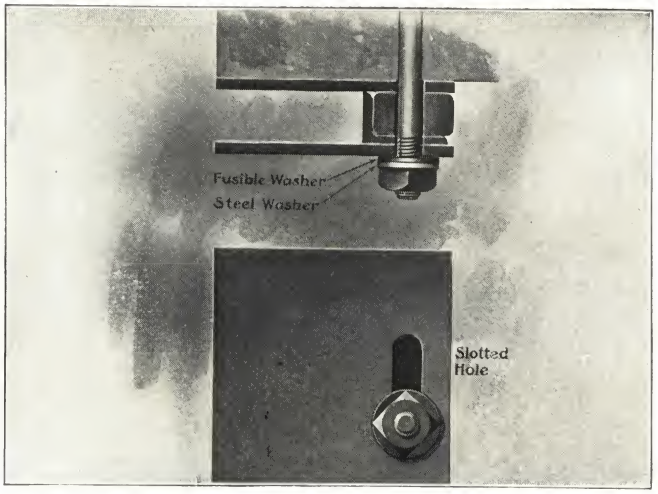
(8) The enclosure of automatic release, protecting it from the weather.

(9) Safety device controlling the speed of curtain in automatic closure.

Catalogues

Our General Catalogue and the special Fire Door Catalogue illustrate many additional types and their applications. These doors and shutters are designed to obtain easy operation in normal service, and are easily opened and reset by a single person after automatic closure.





Salient Features of Kinnear Fire Doors and Shutters

AKBAR FIRE DOORS

(1) Automatic closing of Akbar Doors is positive, being driven from an open to a closed position by means of a powerful motor or push down spring.

(2) A special safety device is provided on each door which controls drop of door in automatic closure and which eliminates every element of danger, as well as the violent impact common to uncontrolled types.

(3) Can be opened and reset without difficulty after automatic closure.

(4) Are available for service purposes at all times and will close automatically from any open position.

Akbar doors are available in three methods of operation:

Manual by means of handles in bottom of bar

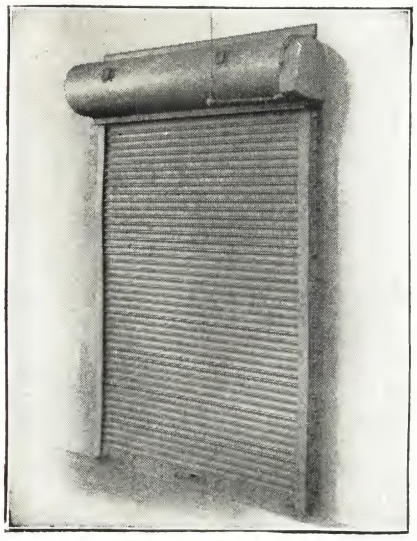
Endless chain with reduction gears

Crank through bevel gears and vertical shaft.

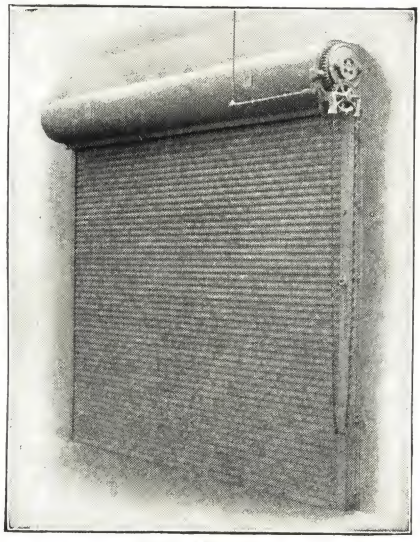
The Underwriters' Laboratories, Inc., label service covers all Akbar constructions for exterior openings not exceeding 100 sq. ft. where width or height does not exceed 12 ft. *See page 8 for clearance dimensions.*

On fire walls, room partitions, elevator shafts and corridor openings the limit of area is 80 sq. ft., the width or height not to exceed 12 ft. Doors in excess of these areas are factory inspected by representatives of the Underwriters' Laboratories, Inc., and a certificate is issued which is a guarantee that the doors are constructed according to label requirements with the exception of size.

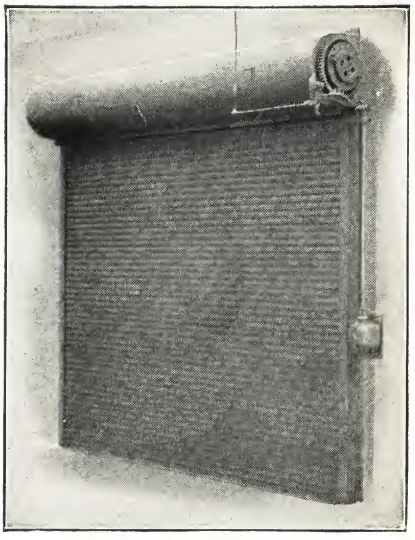
When this service is required it must be indicated with the order.



Manual Operation



Chain Operation



Crank and Shaft Operation

A Few Types of Akbar Construction

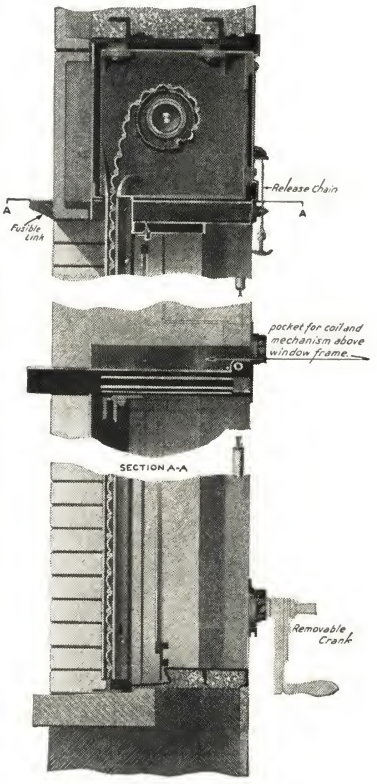
"SUPERIOR" FIRE SHUTTERS

Labeled for exterior window openings not exceeding 100 sq. ft. area, width or height not to exceed 12 ft.

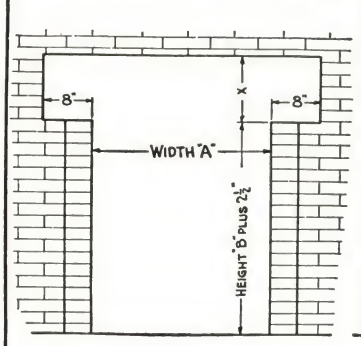
Shutter normally remains in open position. Closes automatically immediately upon parting of the fusible link, being driven from an open to closed position by means of a powerful push down spring.

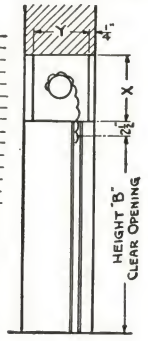
Design permits of periodic testing to assure unfailing automatic closing. After testing, which is accomplished by tripping release chain, shutter can be quickly raised to open position by gearless rewind mechanism and hand crank easily accessible from floor.

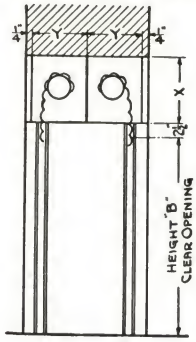
Equipped with impact starting device striking a hammer blow of 200 inch pounds simultaneously with fusing of link or tripping of release chain; this insures complete closure.

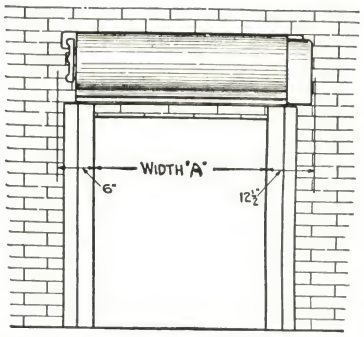


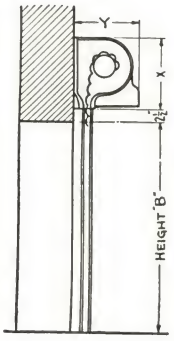
UNDERWRITERS' LABELED – AKBAR FIRE DOORS – AUTOMATIC CLOSING

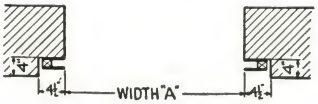


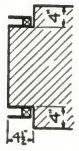




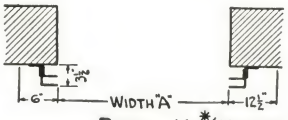








*NOT RECOMMENDED FOR SIZES EXCEEDING 80 SQUARE FEET IN AREA.

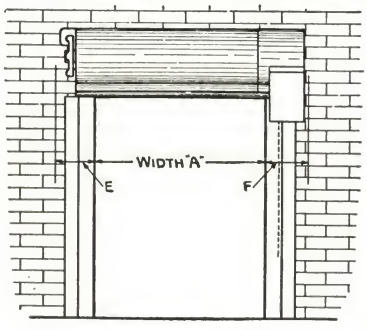


PUSH-UP*(HAND LIFT)

HEIGHT B-FEET		WIDTH A - FEET							
		3	4	5	6	7	8	9	10
6	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	13"	13"	13"	13"	13"	13"	13"	13"
7	X	17"	17"	17"	17"	17"	17"	17"	19"
	Y	13"	13"	13"	13"	14"	14"	14"	16"
8	X	17"	17"	17"	17"	17"	19"	19"	19"
	Y	13"	13"	14"	14"	14"	16"	16"	16"
9	X	17"	17"	17"	17"	19"	19"	19"	19"
	Y	14"	14"	14"	14"	16"	16"	16"	16"
10	X	18"	18"	18"	19"	19"	19"	19"	19"
	Y	15"	15"	15"	16"	16"	16"	16"	16"
11	X	18"	18"	20"	20"	20"	20"	20"	20"
	Y	15"	15"	17"	17"	17"	17"	17"	17"
12	X	20"	20"	20"	20"	20"	20"	20"	20"
	Y	17"	17"	17"	17"	17"	17"	17"	17"

PUSH-UP*(HAND LIFT)

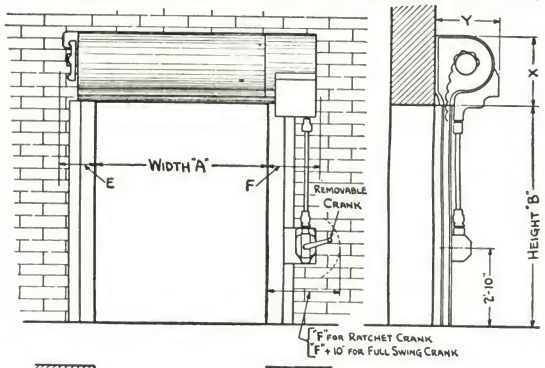
HEIGHT B-FEET		WIDTH A - FEET							
		3	4	5	6	7	8	9	10
6	X	15"	15"	15"	15"	15"	15"	15"	15"
	Y	16"	16"	16"	16"	16"	16"	16"	16"
7	X	15"	15"	15"	15"	16"	16"	16"	18"
	Y	16"	16"	16"	16"	16"	16"	16"	18"
8	X	15"	15"	16"	16"	16"	18"	18"	18"
	Y	16"	16"	16"	16"	16"	18"	18"	18"
9	X	17"	17"	17"	17"	18"	18"	18"	18"
	Y	18"	18"	18"	18"	18"	18"	18"	18"
10	X	17"	17"	17"	19"	19"	19"	19"	19"
	Y	18"	18"	18"	19"	19"	19"	19"	19"
11	X	18"	18"	19"	19"	19"	19"	19"	19"
	Y	18"	18"	19"	19"	19"	19"	19"	19"
12	X	18"	19"	19"	19"	19"	19"	19"	19"
	Y	18"	19"	19"	19"	19"	19"	19"	19"



CHAIN HOIST OPERATION

HEIGHT B-FEET		WIDTH A - FEET							
		5	6	7	8	9	10	11	12
6	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	20"	20"	20"	20"	20"	20"	20"	20"
	E	9"	9"	9"	9"	9"	9"	9"	10"
	F	9"	9"	9"	10"	10"	10"	10"	10"
7	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	20"	20"	20"	20"	20"	20"	20"	20"
	E	9"	9"	9"	9"	9"	9"	9"	10"
	F	9"	9"	9"	10"	10"	10"	10"	10"
8	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	20"	20"	20"	20"	20"	20"	20"	20"
	E	9"	9"	9"	9"	9"	9"	9"	10"
	F	9"	9"	9"	10"	10"	10"	10"	10"
9	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	20"	20"	20"	20"	20"	20"	20"	20"
	E	9"	9"	9"	9"	9"	9"	9"	7"
	F	9"	9"	9"	10"	10"	10"	10"	10"
10	X	17"	17"	17"	17"	17"	18"	18"	18"
	Y	20"	20"	20"	20"	20"	21"	21"	21"
	E	9"	9"	9"	9"	10"	9"	7"	7"
	F	9"	9"	9"	10"	10"	11"	11"	12"
11	X	17"	17"	17"	17"	17"	18"	18"	18"
	Y	20"	20"	20"	20"	20"	21"	21"	21"
	E	9"	9"	9"	9"	9"	7"	7"	7"
	F	9"	9"	9"	10"	10"	11"	11"	12"
12	X	17"	17"	17"	17"	18"	18"	18"	18"
	Y	20"	20"	20"	20"	21"	21"	21"	21"
	E	9"	9"	9"	9"	7"	7"	7"	7"
	F	9"	9"	9"	10"	11"	11"	11"	12"

FOR DOORS OF INTERMEDIATE SIZES, USE CLEARANCE DIMENSIONS LISTED FOR NEXT LARGER WIDTH OR HEIGHT.



CRANK SHAFT OPERATION

HEIGHT B-FEET		WIDTH A - FEET							
		5	6	7	8	9	10	11	12
6	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	17"	17"	17"	17"	17"	17"	17"	17"
	E	9"	9"	9"	9"	9"	9"	9"	10"
	F	12"	12"	12"	12"	12"	12"	12"	13"
7	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	17"	17"	17"	17"	17"	17"	17"	17"
	E	9"	9"	9"	9"	9"	9"	9"	10"
	F	12"	12"	12"	12"	12"	12"	12"	13"
8	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	17"	17"	17"	17"	17"	17"	17"	17"
	E	9"	9"	9"	9"	9"	9"	9"	10"
	F	12"	12"	12"	12"	12"	12"	12"	13"
9	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	17"	17"	17"	17"	17"	17"	17"	17"
	E	9"	9"	9"	9"	9"	9"	9"	7"
	F	12"	12"	12"	12"	12"	12"	12"	13"
10	X	17"	17"	17"	17"	17"	17"	17"	17"
	Y	17"	17"	17"	17"	17"	17"	17"	17"
	E	9"	9"	9"	9"	9"	9"	7"	7"
	F	12"	12"	12"	12"	12"	12"	12"	13"
11	X	17"	17"	17"	17"	17"	18"	18"	18"
	Y	17"	17"	17"	17"	17"	18"	18"	18"
	E	9"	9"	9"	9"	9"	7"	7"	7"
	F	12"	12"	12"	12"	12"	12"	12"	13"
12	X	17"	17"	17"	17"	18"	18"	18"	18"
	Y	17"	17"	17"	17"	18"	18"	18"	18"
	E	9"	9"	9"	9"	7"	7"	7"	7"
	F	12"	12"	12"	12"	12"	12"	12"	13"

-CURTAIN SLATS-

SLAT NO. 2 USED ON ALL DOOR SIZES LISTED ON THIS SHEET.

KINNEAR POWER UNITS

Rolling doors are especially adaptable to electric motor operation and Kinnear power units are available for all sizes of rolling doors. If the arrangement as shown in the illustration is not feasible other applications can be provided.

Electric Power Operation—

The door is driven by electric motor through reduction gearing, the operation being accomplished as follows:

By momentary contact of the "open" or "close" button on the operating switch, the pilot circuit magnetically closes the main line reversing switch and starts motor. The limit switch will, at the termination of the door travel, open the pilot circuit, thereby breaking the main line circuit and simultaneously the magnetic brake will close, stopping the motor. The door can be stopped at any intermediate position by pushing the stop button, from which position it can be either opened or closed.

Emergency Operation—

In the event of interrupted power service, the door can be operated manually by hand chain and sprocket. This is accomplished by a pull on the smaller chain (shown in illustrations) which instantly engages the emergency operator, releases the motor brake and opens the motor control circuit, thereby preventing the motor being inadvertently started until emergency operator is again disengaged. After emergency operator is engaged as above described, door is then operable by hand chain. When not in use, the emergency operating and control chains may be looped over hook located directly under chain sprocket.

Control Switches—

The following control switches are furnished with the power unit:

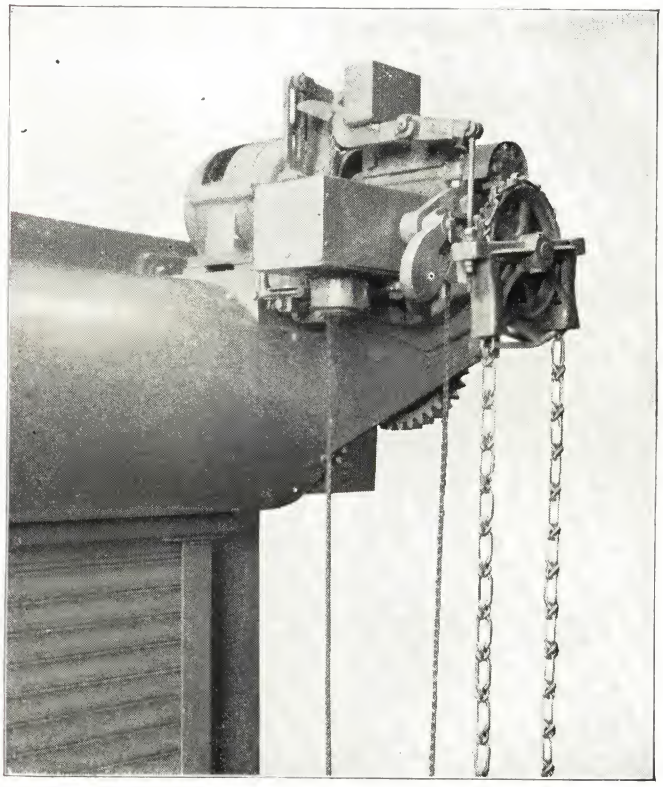
Fusible Line Switch, enclosed safety type—externally operated.

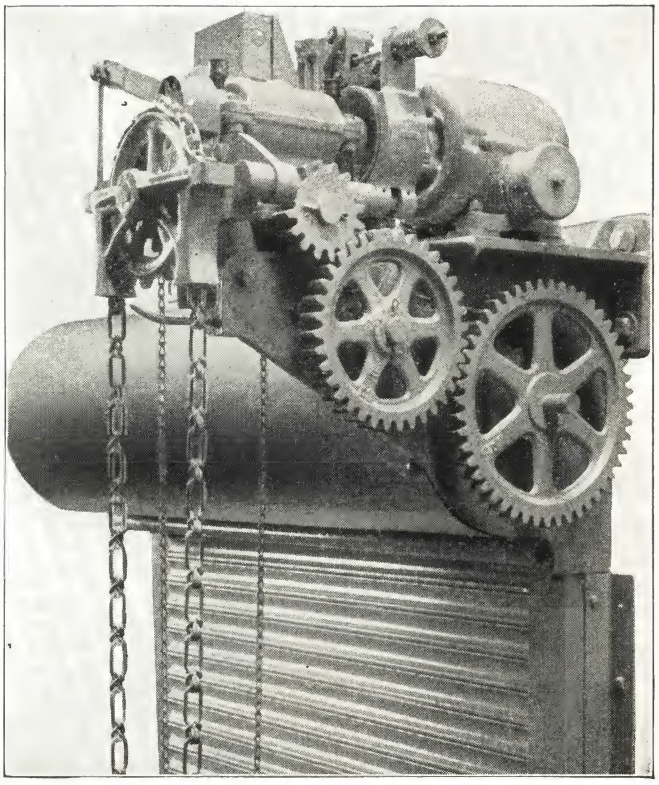
Push Button Station—heavy duty type with three buttons labeled open, close and stop.

Magnetic Reversing Panel for remote control—fully enclosed and provided with temperature overload relay.

Electric Motor—

Series wound motor with high starting torque is used for direct current. High starting torque elevator type motor is used for alternating current.





Kinnear Power Units

Lubrication—

Means are provided for the lubrication of all bearings.

Wiring—

The wire, conduit and fuses are not furnished or installed by THE KINNEAR MANUFACTURING CO., but are to be provided by others in accordance with wiring diagram supplied by the Kinnear Company.

Engineering—

Details, specifications and other information will be furnished upon request. All requests for such information or quotations must be accompanied by complete current characteristics—i.e., the voltage, phase and cycles.

In General—

Kinnear power units are the result of years of painstaking effort, are compact, sturdy and are long past the experimental stage.

Kinnear motor operated doors are in general use everywhere and are great time savers on large openings.

If you have door problems it will give us pleasure to help develop them.

Write for detailed information.

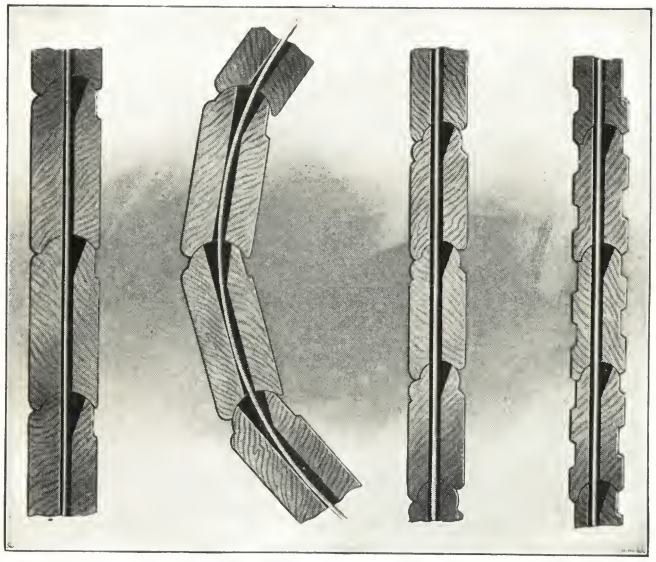
WOOD ROLLING DOORS AND PARTITIONS

For Roundhouses

Wood rolling doors are particularly desirable in cases where chemical action is liable to deteriorate steel. This is particularly true in roundhouses and chemical plants.

These doors are constructed of wood slats assembled on phosphor bronze ribbons placed at proper intervals. Slats are made of cypress and treated with a coat of wood preservative.

Slat No. 27 is used on exterior doors.



No. 27 No. 27 No. 26 No. 24

Sections of Wood Slats

For Schools, Churches, etc.

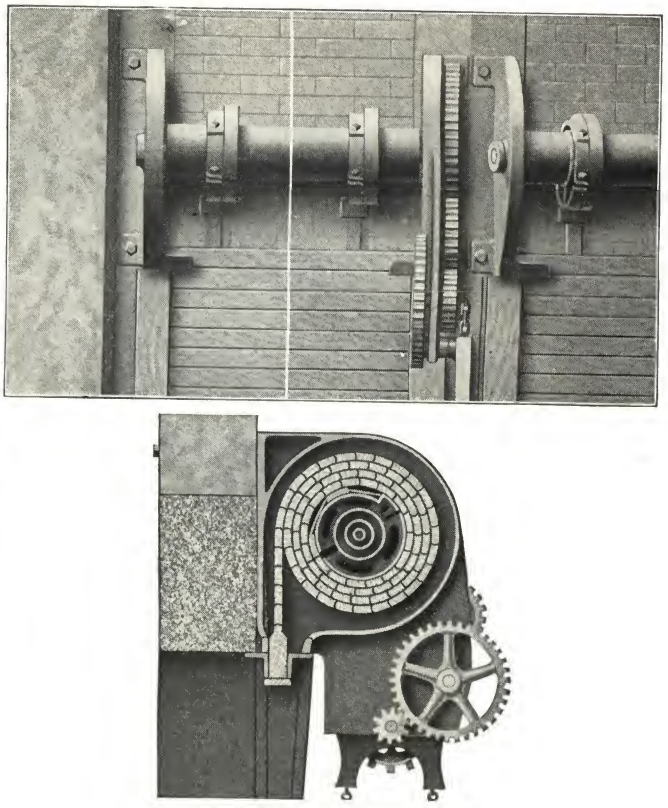
Curtains are composed of slats assembled on phosphor bronze ribbons.

Made in long leaf yellow pine, cypress, quarter sawed oak and birch.

Slats Nos. 24 and 26 are for interior work; slat No. 27 for exterior work.

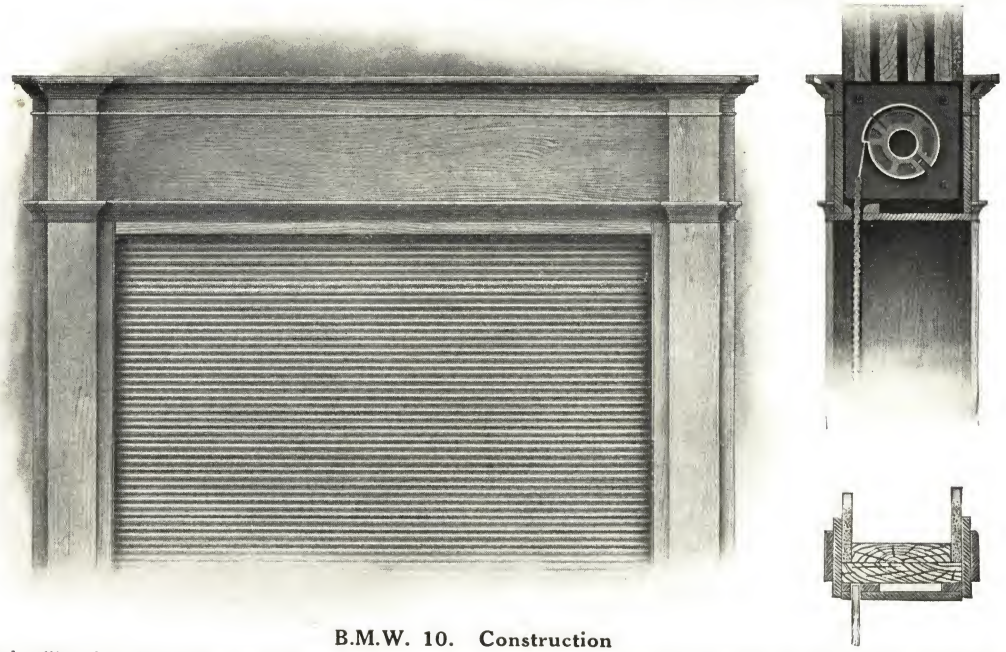
Illustration shows cross section through slats.

The opening through which the ribbon passes is so shaped that, during flexure of the curtain, there is no change in the relative length of the slats or curtain; nor is there any danger of pinching the ribbon.



F.H.W. 22. Construction

Designed especially for roundhouses. Doors mounted on face of wall above opening; travel in grooves at sides. Counterbalanced by springs; operated by means of endless chain and reduction gear



B.M.W. 10. Construction

Application of wood rolling door for interior partition. Coil is concealed under lintel; operated by means of handle in bottom of rail. Mechanical operating devices are furnished for large doors. Can be concealed within the casing. Casing and grooves are not supplied, but should be included in general carpenter work

BIFOLDING DOORS, WOOD OR STEEL

In cases where light is desired through doors, the bifolding type lends itself readily to such condition. These doors may be constructed either of wood or steel, and are of two sections hinged at the center and pivoted at top of opening. The upper panel may be fitted with sash, giving a glass area of about two-thirds the total area of the panel.

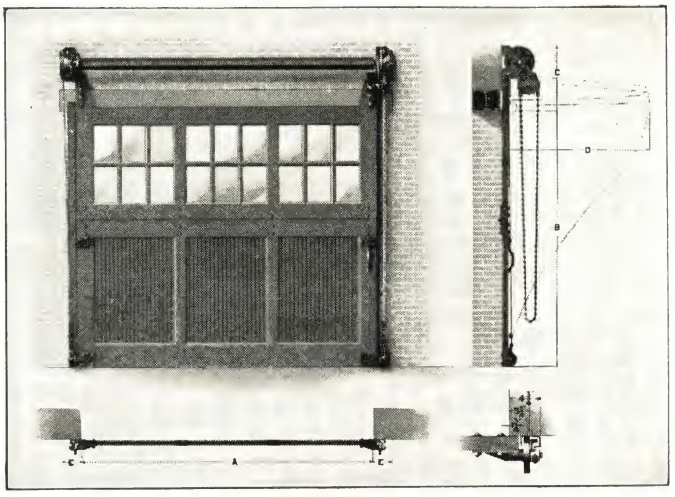
Bifold No. 5

This is without doubt one of the most practical bifolding doors now on the market, requiring less clearance at both head and sides of opening than do most other types.

Kinnear Bifold No. 5 is designed with a spring counterbalance, eliminating the heavy counterweights usually used on this type of door. Steel cables connect the door to the counterbalancing device at the top of the opening. Bottom panel is fitted with rollers which travel in guides attached to wall and transmit the thrust.

The simplicity and sturdiness of the mechanism reduces maintenance to a negligible factor and renders quick and easy operation. Less side clearance is required as there are no counterweights. Send us a sketch showing conditions as they actually exist and we will show how this flexible construction adapts itself to other than standard conditions.

Kinnear panels are fabricated in our own factory from extra heavy materials and are built on a purely quality basis. Write for prices and catalogue.



Bifold No. 5

CLEARANCES REQUIRED FOR BIFOLD NO. 5

Height B	6′ 0″	7′ 0″	8′ 0″	9′ 0″	10′ 0″	11′ 0″	12′ 0″	13′ 0″	14′ 0″	15′ 0″
C	26½″	26½″	26½″	26½″	28½″	31″	33″	35″	35″	37″
D	3′ 10″	4′ 4″	4′ 10″	5′ 4″	5′ 11″	6′ 6″	7′ 1″	7′ 8″	8′ 2″	8′ 9″
E	8″	8″	8″	8″	8″	10″	10″	10″	10″	10″

Dimension A should not exceed 18 ft.; dimension B should not exceed 15 ft.

Pennsylvania Railroad Fruit House, Pittsburgh, Pa.

VERTICAL SLIDING DOORS

This type of door is particularly suitable for freight houses, piers and warehouses where light is essential through doors.

The door comprises two or more sections consisting of trussed frame covered with corrugated iron, hung independently with chains connected with counterbalance weights. Operated by means of endless chain and suitable reduction gearing.

Where doors are mounted on steel columns, guides and weight boxes should be incorporated as a part of the column, and should be supplied by the steel contractor, according to details supplied by our Engineering Department.

This type can also be supplied to be mounted on the face of the wall, in which case we furnish weight box and guides as part of the equipment.

It is advisable to procure definite information from the factory in connection with this type of door.

"ROL-TOP" GARAGE DOORS

"Steel reinforced free rolling garage door"

Uses

While "Rol-Top" is primarily a residential garage door, the new type of door convenience and economy it offers has caused it to have a rapidly increasing demand for use in public garages, service stations, warehouses and other buildings requiring a closing arrangement. It also finds special uses in boathouses, sanitariums, pavilions, arenas and resort concessions.

Advantages

Like other Kinnear products, the "Rol-Top" is designed to give maximum door convenience and efficiency in addition to the highest quality construction. Rolling up and out of the way, "Rol-Top" gives complete opening clearance and requires no costly wall or floor space.

A car or other object may be placed within a fraction of an inch of either side of the door and still permit the door being opened. Rain, sleet, snow or wind cannot impede its operation. Counterbalanced with a single spring placed above the lintel, out of sight and danger, there is no chance of the door binding. Reinforced with steel truss members and of neat design, "Rol-Top" insures years of uninterrupted service and adds to the attractiveness of the opening. Being easy to install and requiring small clearances "Rol-Top" is equally suited to the new or old building.

Special Features of "Rol-Top"

Perfect counterbalance gives easy operation.

Requires no floor or wall space.

Will not sag, bind or warp.

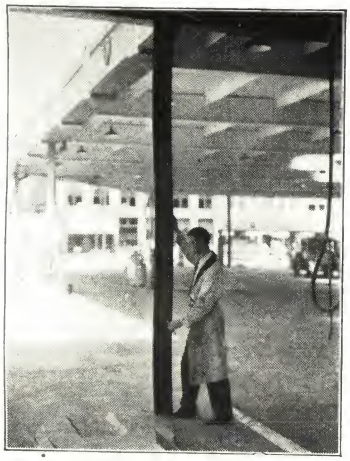
Wind, ice or snow will not impede operation.

Weathertight—fits snugly to jamb.

Light, yet strong, durable and dependable.

Neat, attractive and harmonizes with any architecture.

Built by a Company with thirty-six years' door experience.



Sliding Center Post

It may be pushed out of the way, permitting clear opening when two or more doors are used for one opening. If preferred, swinging post can be supplied

At Left:

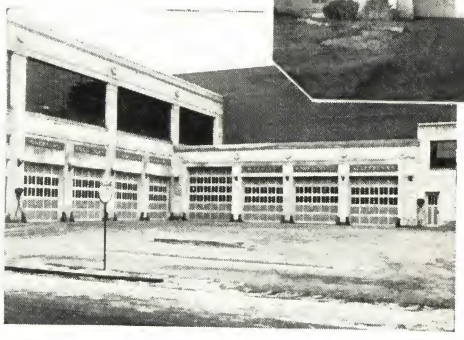
"Rol-Top" Open

When "Roll-Top" is opened, little clearance is required on either side of the door. Car or other object may be placed within a fraction of an inch of it

At Right:

Adaptability of "Rol-Top"

For either the pretentious or more moderate residence the "Rol-Top" gives a neat, attractive and harmonious appearance—plus real convenience and service



At Right:

"Rol-Tops" Used by Service Stations

Illustration shows one of many such chains of service stations. When placed in front of hydraulic lifts, a special arrangement of tracks carry the door sufficiently high to operate the lift

One of the Many Artistic Panel Designs from Which "Rol-Top" May Be Built

Built to special order where a distinct style of architecture requires it. Standard hardware is used and sections are reinforced with the customary steel truss member

Inside View of "Rol-Top"

Inside appearance is neat and clean-cut. Ceiling is free of equipment other than tracks. Single counterbalance spring is encased above opening, out of sight and danger. Perfect balance enables one to open it to any height. It may be slightly raised, and locked, if ventilation is required

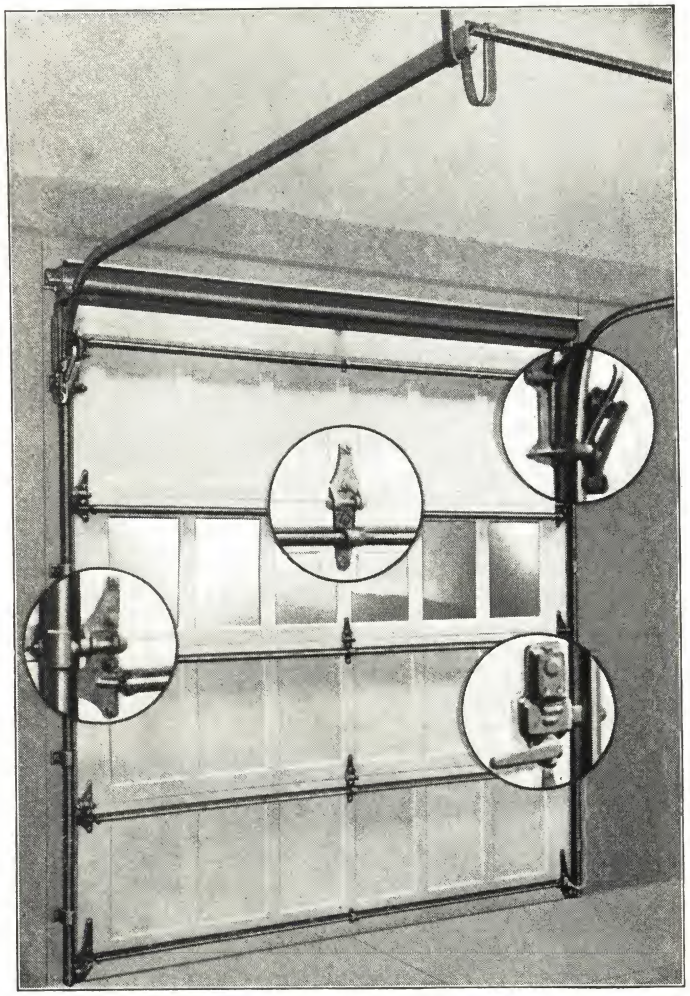


Illustration Showing "Rol-Top" Construction

Reinforced with steel trusses.
Single spring counterbalance.
Heavily designed hardware.
Snug-fit guide brackets.
Single bolt type lock.
Tie angle and spring bumpers.
Ball bearing rollers.
Steel cable or tape.
Cover for counterbalance spring.
Prime coat of paint.

Construction

The door sections are made of the best grade of wood and shiplapped. Stiles and rails mortised and tenoned together, steel doweled and glued with casein-waterproof glue. All sections are reinforced with V-shaped galvanized steel bars which give a truss action through connection with the hinge castings, and eliminate warping and buckling. Hardware is of heavy design bolted with carriage bolts. Track is of heavy steel and rollers are ball bearing.

A single oil-tempered helical spring placed horizontally above the door gives a perfect pull on both sides of the door. It is connected to the door by steel cable or tape, with a safety factor of not less than ten.

The guide brackets force the door close to the jamb, giving maximum weather protection. A standard make lock in connection with slide bolt furnishes dependable locking.

Auxiliary Equipment

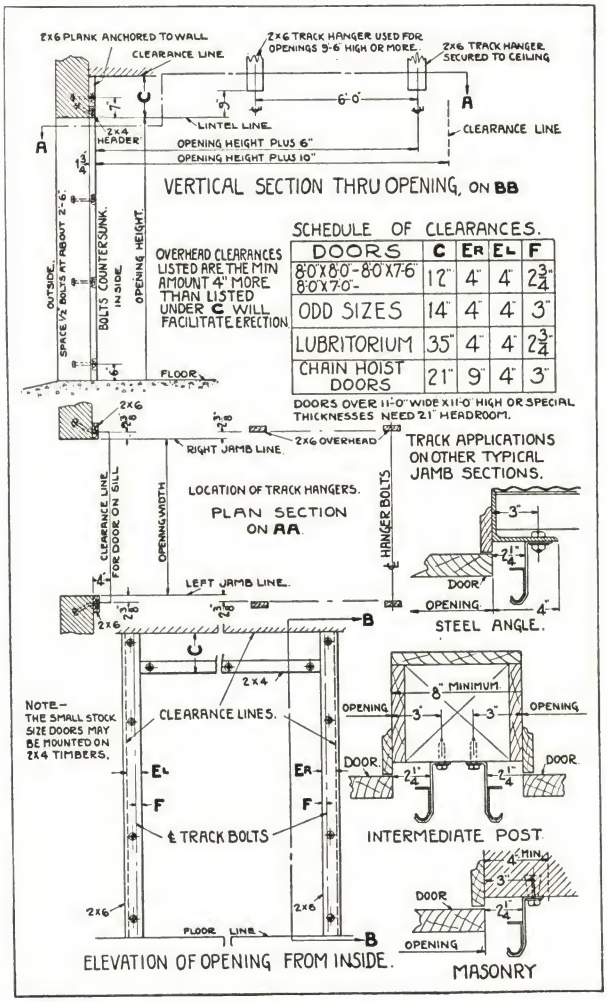
Sizes in stock for immediate shipment 8x8 ft., 8 ft. x 7 ft. 6 in., and 8x7 ft. Other sizes quickly fabricated to order. "Rol-Top" may be equipped with endless chain and reduction gear for mechanical operation for large openings; motor operator for electric control, or mechanical releasing device for automatic opening. Any number of sash sections can be supplied. For exceptionally large openings two doors with swinging or sliding center post may be used. When operated in front of hydraulic lifts, specially arranged tracks carry door close to ceiling. Small pass or wicket doors may also be furnished.

Installation

The "Rol-Top" comes in sections, with all hardware applied and with all operating mechanism, tracks, track clips, bolts and detailed erection instructions—everything to install the door with exception of glass—making erection a simple job for a competent carpenter. For clearances and data on the recommended preparation of your opening, note the drawing below. Following these recommendations insures the most satisfactory installation.

Further Information

For further information, write Kinnear.



ESTABLISHED 1900

GEO. W. JOHNSON MFG. CO.

INCORPORATED 1906

Johnson Steel Rolling Doors and Shutters

ST. LOUIS, MO. KANSAS CITY, MO.

REPRESENTATIVES IN PRINCIPAL CITIES

Products

STEEL ROLLING DOORS and SHUTTERS.

Types

Johnson Steel Rolling Doors and Shutters are furnished in two general types:

(1) Service doors and shutters—where labels are not required;

(2) Underwriters' labeled doors and shutters—for the protection of openings where insurance rates are a consideration.

Labeled doors and shutters are built in strict accordance with the Underwriters' requirements for proper classification of the openings for which they are intended. They are inspected and labeled at our factory by a representative of the Underwriters' Laboratories, Inc.

The Underwriters classify openings, and specify gauges of curtains as follows:

Division fire wall	Class A—No. 16 U. S. gauge
Interior vertical shaft	Class B—No. 20 U. S. gauge
Corridor or room partition	Class C—No. 20 U. S. gauge
Exterior wall	Class D—No. 22 U. S. gauge

Labels are attached to doors for openings not over 80 square feet in area for classes A, B, and C, and not over 100 square feet for class D, with a maximum allowable dimension of 12 feet in either width or height for all classes. "Certificates of Inspection" are issued by the Underwriters' Laboratories, Inc. for oversized doors.

Operation

Push-up, by means of handles on bottom plates of nominal sized doors.

By chain, sprocket and reduction gearing.

By crank, shafting and reduction gearing.

By electric motor operating equipment.

Installation

Generally on face of wall with brackets and shaft above the lintel. Where necessary or desirable, with brackets within the opening under the lintel and with guides attached to the jambs. Such an installation can be made in existing openings, but better method is to prepare the opening by providing pockets for the brackets and rabbetted jambs to receive and protect the guides.

Advantages

Steel rolling doors leave entire floor space available; are easily operated regardless of size, are economical in maintenance, are long lived, and are unaffected by climate changes.

Construction Features

The drum, around which the curtain coils, revolves on *roller bearings* around a *stationary* center shaft supported by the end brackets. Highest grade oil-tempered flat motor springs, contained in the drum, are used to counterbalance the weight of the curtain. *Speed and ease of operation are assured by the full roller-bearing shaft construction, and an improved and perfected internal gear drive to the door drum is used on all chain, crank and motor operated doors.* The drum supplies continuous support to the curtain at the point of attachment.

Curtains are constructed of interlocking slats formed from rust-resisting cold rolled steel galvanized to meet the requirements of the Underwriters' Laboratories, Inc. Malleable iron endlocks, riveted to the curtain edges, prevent lateral movement of the slats and provide a wearing surface in the guides.

Brackets are constructed of reinforced steel plates, this construction combining great strength with minimum weight, and readily adapting itself to the difficult and unusual requirements often encountered.

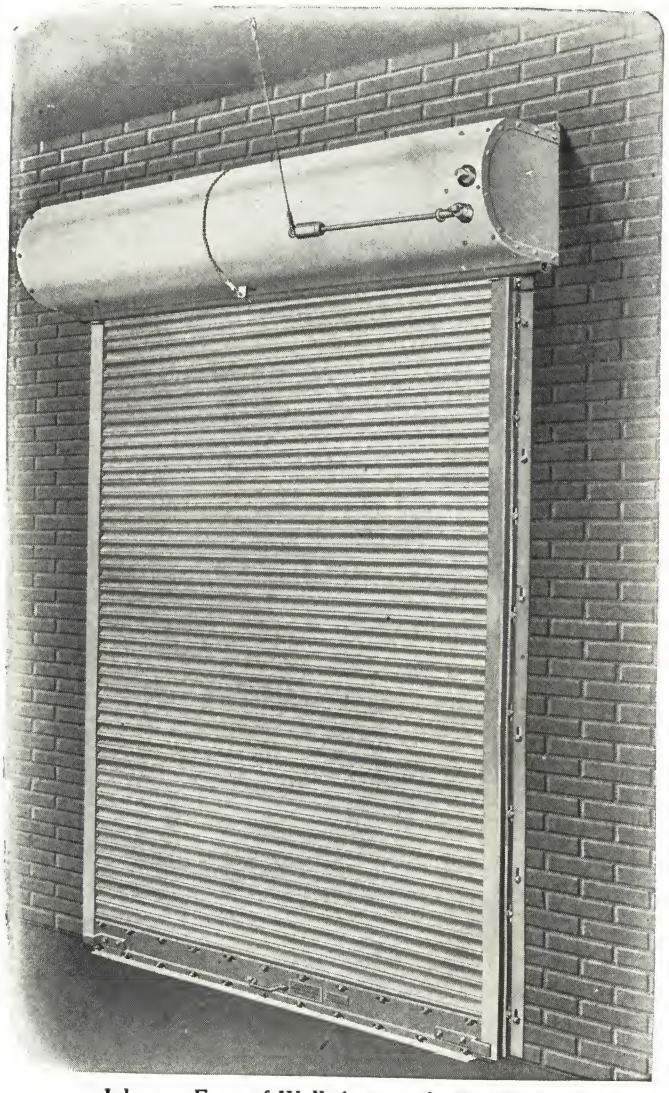
Castings are soft gray iron, malleable or steel, moulded from properly designed metal patterns and fully machined where required. Steel or malleable iron castings are used for all parts requiring great strength, and all gear shafts are of cold rolled steel.

Galvanized sheet metal hoods are furnished on all doors to cover the coils.

Alemite fittings are provided for easy and proper lubrication on all principal bearings.

Where required, doors are provided with means for locking.

Motor Operators—Powerful but compactly designed. Mounted directly on the door bracket or on a bed plate independently supported, and directly coupled to the door shaft. Units consist of motors, magnetic solenoid brakes, reduction gears and gear driven limit switches. Reduction gears are enclosed and run in an oil bath. Control equipment usually consists of a magnetic reversing switch with thermal relay for motor protection, and one or more three-button push-button stations marked "Open," "Close" and "Stop." General Electric Company's electrical equipment is standard. Provision is made for emergency hand operation.



Johnson Face of Wall Automatic Fire Door

Union Pacific Freight House, Topeka, Kan.

STANDARD CLEARANCES REQUIRED FOR DOOR COILS

Please note these are standard dimensions; modifications can be made to meet conditions.

Clear opening height, feet	Face of wall doors, distance above lintel, inches	Face of wall doors, projection from wall, inches	Between jamb doors, clear opening to lintel, inches	Between jamb doors, dimension through wall, inches
Up to 9	19	16	19	16
9 to 12	20	17	20	17
12 to 16	21	18	21	18
16 to 18	24	21	24	21
18 to 21	25	22	25	22
21 to 25	26	23	26	23

DIMENSIONS REQUIRED FOR STANDARD OPERATING MECHANISMS: MEASUREMENTS TAKEN FROM LINE OF OPENING JAMB

Please note these are standard dimensions; modifications can be made to suit conditions.

Opening width, feet	Non-automatic doors, inches			Automatic doors, inches			
	Adjusting end	Chain end	Crank end	Plain end	Chain end	Crank end	Automatic end
Up to 10	6½	8½	8½	4½	8½	8½	8
10 to 14	7	9	9	5	9	9	8½
14 and over	7½	9½	9½	6	9½	9½	9

CLEARANCES REQUIRED FOR STANDARD GUIDES

Please note these are standard dimensions; modifications can be made to suit conditions.

Clear opening width, feet	Face of wall construction, inches		Between jamb construction, inches	
	For attachment to masonry	For attachment to steel	Plain end of door	Operating end
Up to 8	4½	3	3½	4½
8 to 10	5	3½	4	5
10 and over	6	4	4½	5½

Note: Dimensions given above include $\frac{5}{16}$-in. distance the front edges of guides set back from jambs.

SPECIFICATION NUMBERS FOR "JOHNSON" STEEL ROLLING DOORS AND SHUTTERS

Types	Face of wall installation			Between jamb installation						Motor operated
				In prepared opening			In plain opening			
Service non-aut.	Push-up	Chain	Crank	Push-up	Chain	Crank	Push-up	Chain	Crank	**Classification of Opening**
Underwriters' labeled automatic	100	110	120	10R	11R	12R	10P	11P	12P	
	700	710	720	70R	71R	72R	70P	71P	72P	"A" division fire wall openings
	600	610	620	60R	61E	62R	60P	61P	62P	"B" interior vertical shaft "C" corridor or room partition
	500	510	520	50R	51R	52R	50P	51P	52P	"D" exterior door openings
	400	410	420	40R	41R	42R	40P	41P	42P	window openings
Non-aut. labeled	300	310	320	30R	31R	32R	30P	31P	32P	"D" exterior door openings

"MECCO" ROLLING DOORS

Manufactured by

The Moeschl-Edward Corrugating Co.

(Incorporated)

CINCINNATI, OHIO

AGENTS IN ALL PRINCIPAL CITIES

Design of "Mecco" Rolling Doors

Mecco Steel Rolling Doors and shutters are designed by engineers backed by a fund of experience extending over a period of many years and complete engineering knowledge of the requirements of this subject. No changes or innovations are put on the market before these have been tested thoroughly and have been proven to be as near mechanically perfect as it is possible to make them. In short, sound engineering and design is maintained throughout.

Manufacturing Facilities

Mecco Rolling Steel Doors are manufactured by an established concern with many years experience in making metal doors of various types. These doors are manufactured in a modern factory building equipped with the most up-to-date tools and machinery.

Financially, Mecco Rolling Doors are manufactured by a concern able to handle the largest or smallest contract with absolute safety to the customer.

Installation

Due to the superiority of the design of Mecco doors the installation of these doors is made as simple as is possible with any similar mechanical device.

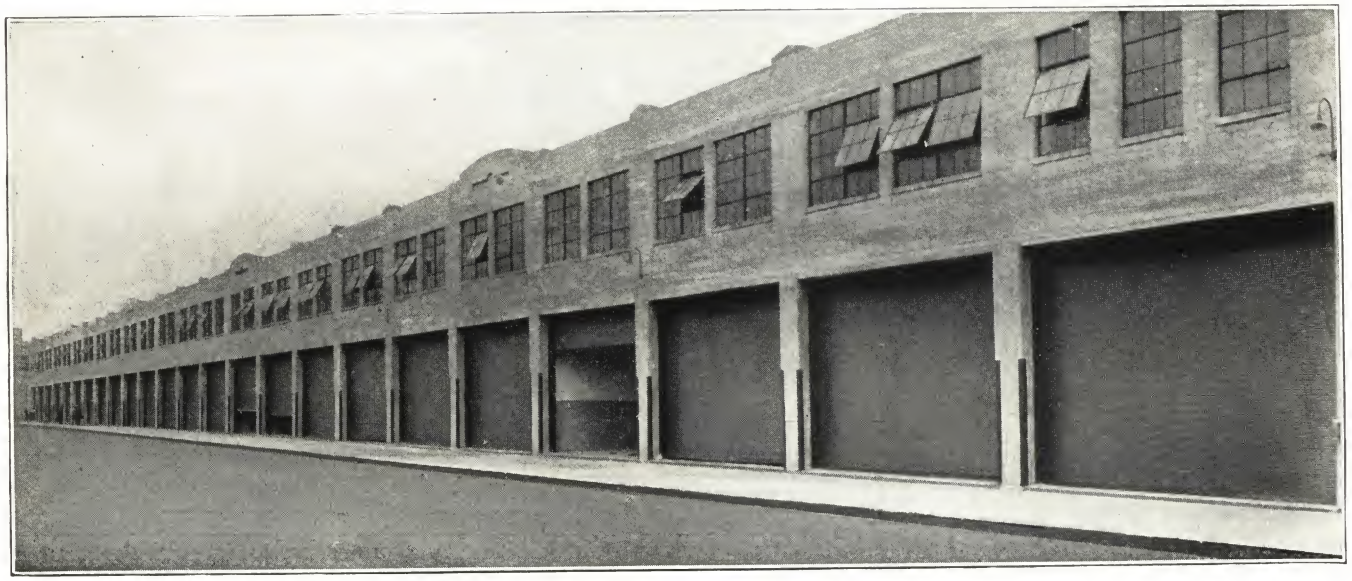
The doors can be installed with local labor at a minimum expense from complete information which we supply.

Maintenance

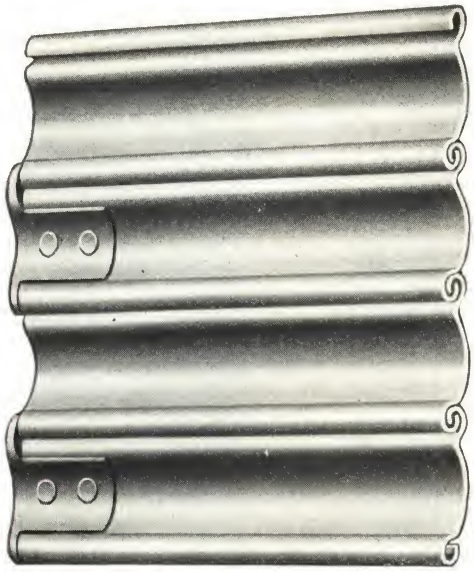
Mecco doors are constructed of the highest class of material by high grade mechanics working under modern conditions. For this reason the maintenance of Mecco Doors is kept at a minimum. In case of accidental damage, curtains or mechanical parts can be supplied upon short notice to make any needed repairs.

Mecco doors are guaranteed against defects in material or workmanship when they leave our factory.

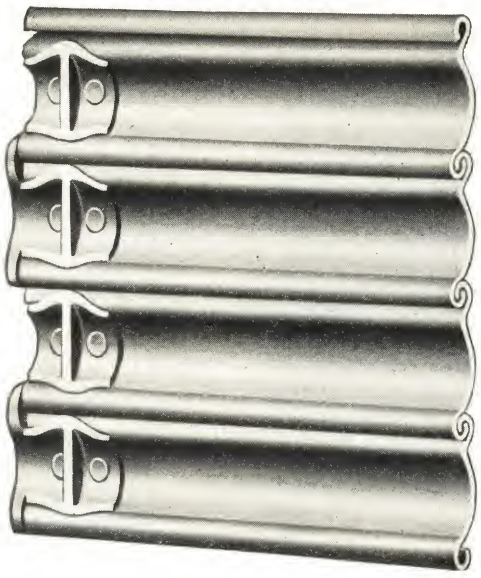
The financial standing of this company guarantees the possibility of securing replacement parts of any Mecco door sold in the past or future.



Northern Ohio Fruit Terminal, Cleveland, Ohio



SLAT NO. 40
with Alternate End Locks



SLAT NO. 40
with Continuous End Locks

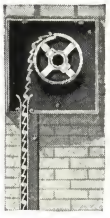
Curtains

Curtains of all Mecco Rolling Steel Doors are made of galvanized copper bearing open hearth steel interlocking slats. This is the steel proven to be of greatest rust resisting properties in tests conducted by the American Society for Testing Materials.

Slats are formed by modern rolling machinery with easy curves and bends that insure utmost strength and rigidity in curtains. Ends of slats are provided with malleable iron end locks to prevent lateral movement and furnish wearing surface.

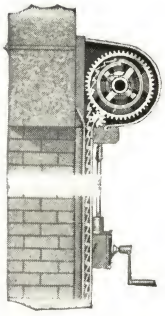
All curtains are hung on shafts provided with roller or ball bearings, thus reducing friction to a minimum and making Mecco doors easy to operate regardless of the character of operation. See detailed specifications for other portions of door and curtain.

Types of Operation



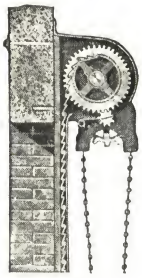
Manual Door

Operation handle on bottom bar. Mounted under lintel. Suitable for openings not over 10 ft. x 9 ft. 6 in.



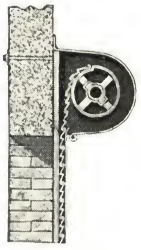
Crank and Gear

Operation may be from one or both sides of wall



Chain and Gear

Operation for larger doors. Mounted face of wall — can supply same operation for door mounted under lintel



Manual

Operating handle on bottom bar. Mounted face of wall. Suitable for openings not over 10 ft. x 8 ft.

Motor Operation

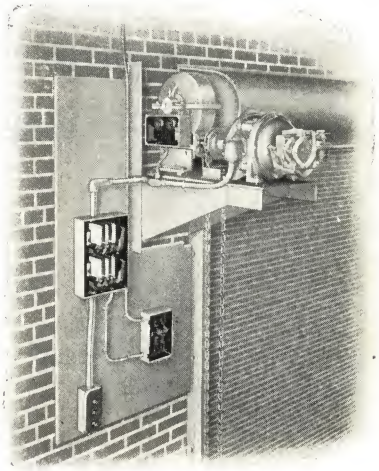
This type of rolling steel door is particularly suitable for large Entrance and Exit Doors for Garages, Track Entrances, Crane Way openings and all similar openings where it is necessary or desirable to operate the doors electrically from a position close to or remote from the entrance.

The doors are usually provided with a single operating station although multiple operating stations can be supplied where conditions make this necessary.

Motors of standard make and with certain properties especially suitable for operating these doors are supplied and provided with equipment to suit each installation.

Motors are connected direct to reduction gears. They are provided with an adjustment so that perfect alignment may be secured. The power is transmitted to the rolling door shaft direct from the reduction box.

The movement of the curtain is controlled by limit switches supplemented on larger doors by solenoid brake.



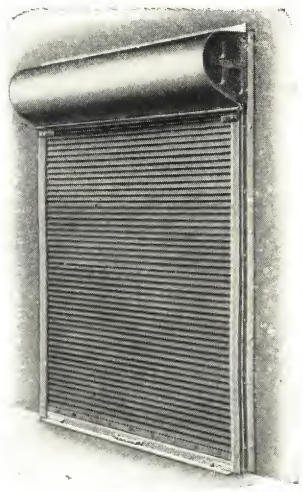
The doors are operated by push button control with an *up* and *down* button and an emergency *stop* button. All motor operated doors are provided with an emergency hand operating chain.

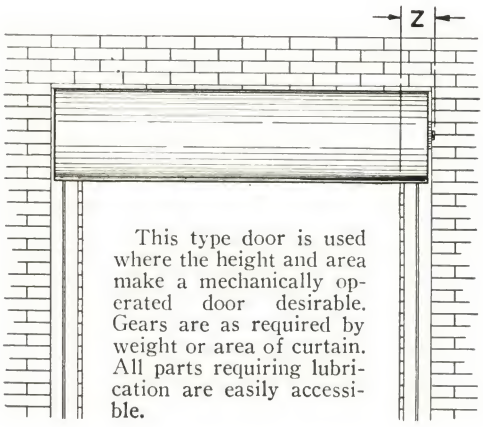
A Mecco Motor Operated Door is an investment in time saving which will continue to pay dividends years after the initial cost has been realized in service. They only require the simple attention that is required of all mechanical equipment such as oiling and greasing of the parts designated. If this is taken care of properly, the life of a *Mecco Motor Operated Door* is indefinite.

Estimating Data

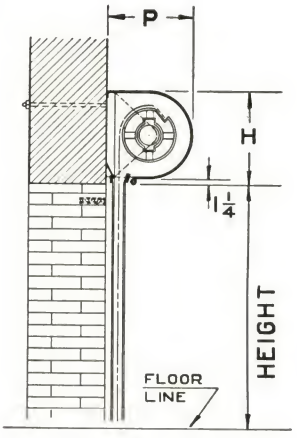
To estimate motor operated doors we should have complete information as to the kind of electrical service available. This data should cover the kind of current, phase and cycle. We should also be supplied with details or a sketch showing the available room at the side and above the opening. Sketch should also show any obstructions in close proximity to the opening which might interfere with the operation of the door or motor.

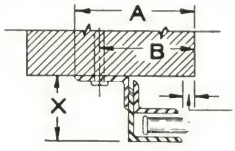
TYPE No. 2
MOUNTED FACE OF WALL
OPERATED BY HANDLE ON BOTTOM BAR



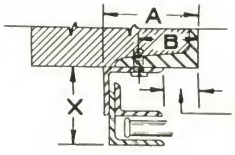


This type door is used where the height and area make a mechanically operated door desirable. Gears are as required by weight or area of curtain. All parts requiring lubrication are easily accessible.

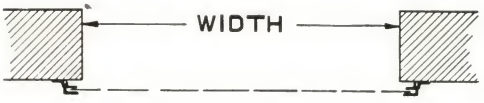




GUIDE NO
4-A
6-A

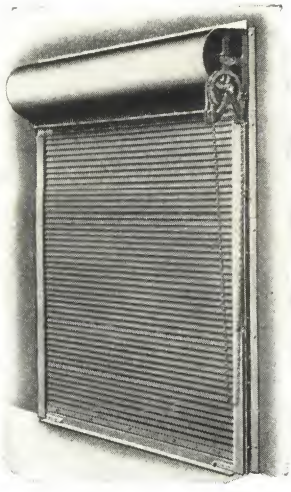


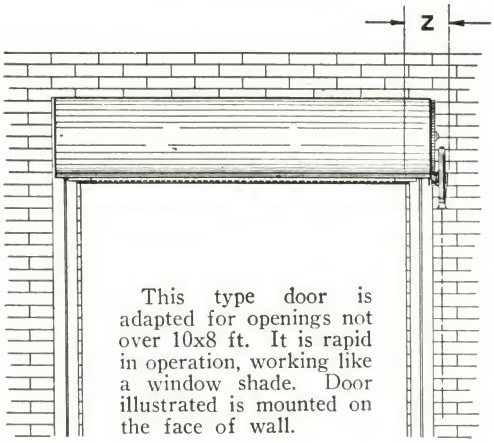
GUIDE NO
3
5



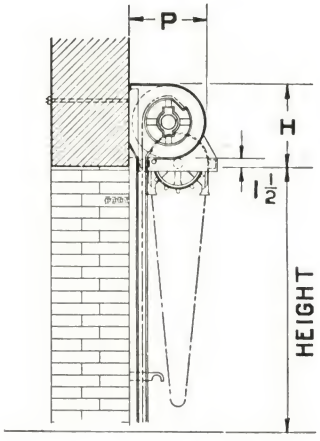
Hgt. Opg.	H	P	Width	Guide No.	A	B	X°	Z	Guide No.	A	B	X	Z
0 to 7′	12½″	12″	3 to 10′	4 A	5⅛″	4″	3 3/16″	5 3/16″	3	2½″	1¼″	3⅜″	4⅞″
7 to 8′	13½″	14″	10 to 12′	6 A	5⅜″	4¼″	2 15/16″	5 7/16″	5	3″	1½″	3⅛″	5⅜″
8 to 10′	14½″	14″											

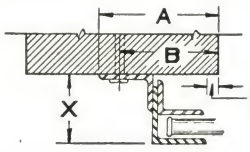
TYPE No. 6
MOUNTED FACE OF WALL
OPERATED BY CHAIN, SPROCKET AND GEAR



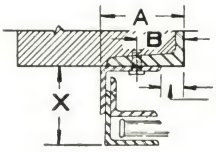


This type door is adapted for openings not over 10x8 ft. It is rapid in operation, working like a window shade. Door illustrated is mounted on the face of wall.





GUIDE NO
4 A
6 A
8 A

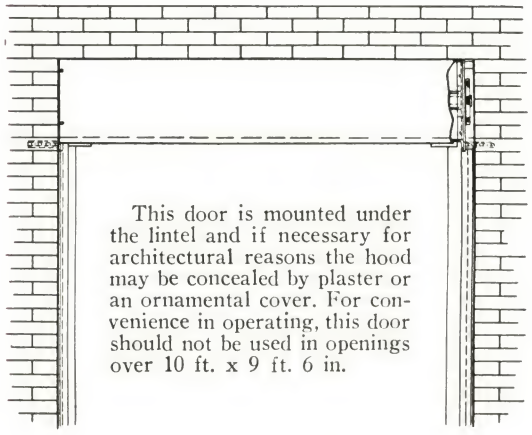


GUIDE NO
3
5
7

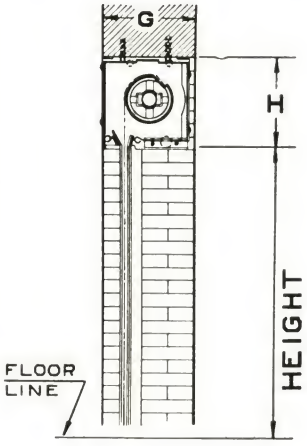
Hgt. Opg.	H	P	Width	Guide No.	A	B	Z	R	Guide No.	A	B	Z	* R
0 to 7′	12½″	12″	0 to 10′	4A	5⅛″	4″	6½″	5¼″	3	2½″	1¼″	4⅞″	6⅝″
7 to 8′	13½″	13″	10 to 12′	6A	5⅜″	4¼″	6¾″	5½″	5	3″	1½″	5⅜″	6⅞″
8 to 11′	14½″	14″	12 to 14′	8A	6⅛″	5″	7¼″	6¼″	7	3½″	2″	5⅞″	7⅜″
11 to 13′	15½″	15″	14 to 15′	8A	6⅛″	5″	7¼″	6¼″	7	3½″	2″	5⅞″	7⅜″
13 to 15′	16½″	16″											

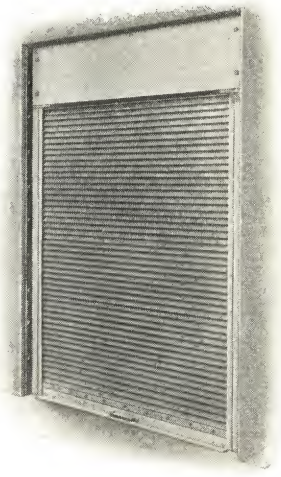
* Dimension R taken from jamb indicates extension of adjustment ratchet located on bracket opposite end from chain operator; for guides 3, 5 and 7.

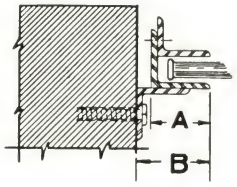
TYPE No. 4
MANUAL OPERATED—UNDER LINTEL
GUIDES FACE OF JAMB

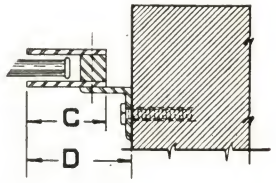


This door is mounted under the lintel and if necessary for architectural reasons the hood may be concealed by plaster or an ornamental cover. For convenience in operating, this door should not be used in openings over 10 ft. x 9 ft. 6 in.



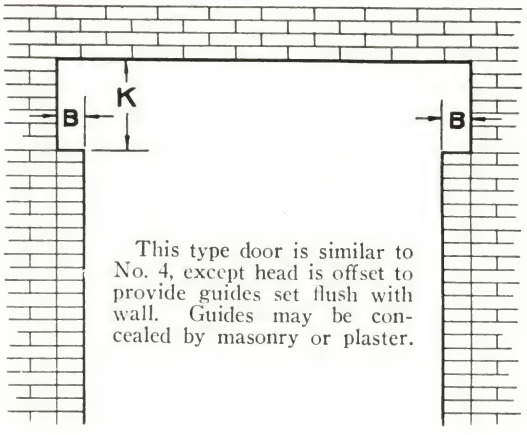




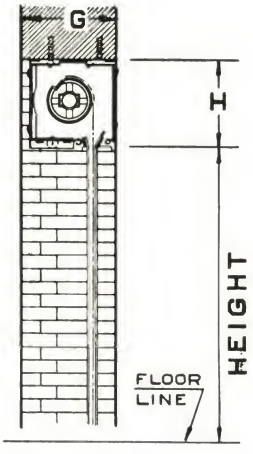


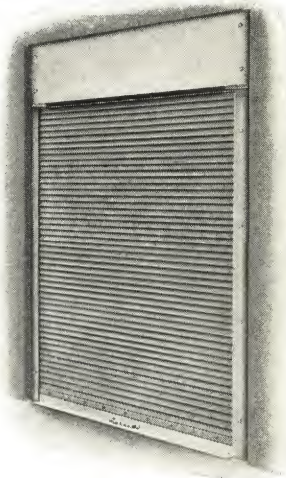
HGT. OPG.	H	G	WIDTH	A	B	C	D
0 to 8 ft. 8 to 10 ft.	13½ in. 14½ in.	13 in. 14 in.	0 to 7 ft. 7 to 10 ft.	2 in.	2½ in.	2 in.	3⅝ ins.

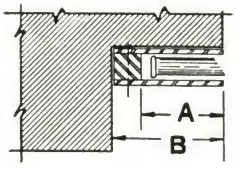
TYPE No. 5
MANUAL OPERATED—UNDER LINTEL—GUIDES RECESSED

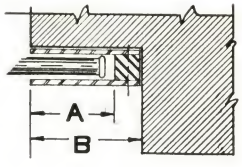


This type door is similar to No. 4, except head is offset to provide guides set flush with wall. Guides may be concealed by masonry or plaster.







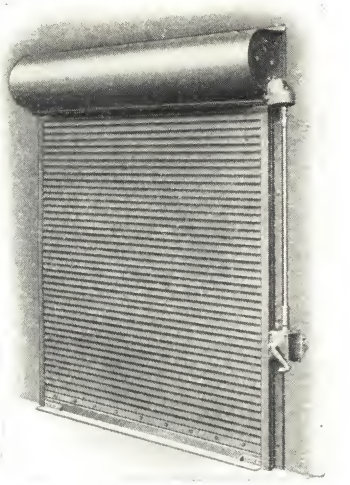


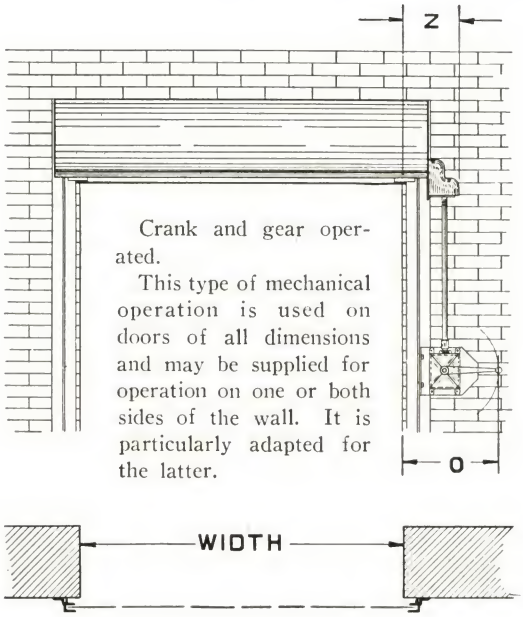
HGT. OPG.	H	G	K	WIDTH	A	B
0 to 8 ft. 8 to 10 ft.	13½ 14½	13 14	14 15	0 to 7 ft. 7 to 10 ft.	2 in.	4 in.

TYPE NO. 10

MOUNTED FACE OF WALL

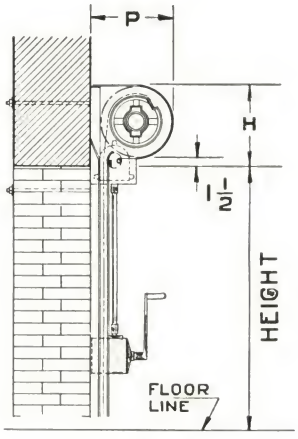
OPERATED BY CRANK AND GEAR

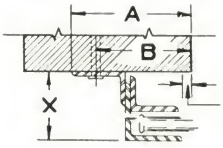




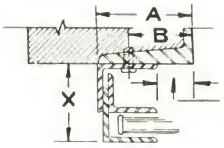
Crank and gear operated.

This type of mechanical operation is used on doors of all dimensions and may be supplied for operation on one or both sides of the wall. It is particularly adapted for the latter.





GUIDE NO 4 6



GUIDE NO 3 5

Hgt. Opg. ft.	H in.	P in.	Width	Guide No.	A in.	B in.	X in.	Z in.	O in.	R in.	Guide No.	A in.	B in.	X in.	Z in.	O in.	R in.
0 to 7°	13½	13	0 to 10 ft.	4A	5⅛	4	3 3/16	10¾	18⅞	5¼	3	2½	1¼	3⅜	10⅜	18½	4⅞
7 to 8°	13½	13	10 to 12 ft.	6A	5⅜	4¼	2 13/16	11	19⅛	5½	5	3	1½	3⅛	10⅞	19	5⅜
8 to 11°	14½	14	12 to 14 ft.	8A	6⅛	5	3 7/16	11¾	19⅞	6¼	7	3½	2	3⅝	11⅜	20	5⅞
11 to 13°	15½	15	14 to 15 ft.	8A	6⅛	5	3 7/16	11¾	19⅞	6¼	7	3½	2	3⅝	11⅜	20	5⅞
13 to 15°	16½	16															

SPECIFICATIONS FOR COMMERCIAL DOORS

The following are general specifications applying to all types of commercial doors:

Opening shall be equipped with Steel Rolling Doors of Interlocking Slat Type as manufactured by The Moeschl-Edwards Corrugating Co., Inc., of Cincinnati, Ohio. Doors to be constructed in accordance with following specifications:

Curtain—To be formed of Interlocking Slats of 22 (or 20, 18 or 16) U. S. gauge copper bearing steel, galvanized by the hot or electro process. The ends of each alternate slat to be fitted with malleable reinforcement to prevent lateral movement and to serve as wearing surface in the guides. The upper edge of curtain to be attached to the spiral rings on shaft by machine bolts and the lower edge to bottom bar by rivets.

Counterbalance—To consist of helical oil tempered steel springs, enclosed within a barrel and anchored to spindle.

Brackets—High grade gray iron, web not less than ⅜ in. and attached direct to guides.

Bottom Bar—To consist of steel angle of proper dimensions for reinforcing bottom of curtain.

Barrel—Steel pipe or tube with ends enclosed by cast iron collars with roller or ball bearings disposed on steel spindles at each end and supported by bosses or flanges cast on, or applied to brackets, or to bearings in brackets. A charging ratchet, for adjusting the spring, shall be attached to either or both spindles. Barrel shall be equipped with cast iron wheels of proper diameter to maintain a correct counterbalance.

Guides—To be composed of three angles of 3/16 in. steel securely riveted together to form a channel groove not less than 1½ in. deep.

Painting—All parts to receive one shop coat metallic paint.

To foregoing add following paragraphs to cover type required.

Type No. 2

Location—Doors to be hung on face of wall; brackets and guides so placed that clear width of opening will be maintained, except where structural conditions of the building prevent.
Operation—Handle on the bottom bar.

Type No. 6

Location—Doors to be hung on face of wall; brackets and guides so placed that clear width of opening will be maintained, except where structural conditions of the building prevent.
Operation—Chain, sprocket and gear.

Type No. 4

Location—Doors to be hung under the lintel; brackets and guides placed within the opening with guides attached to the jambs in such a way that no part will project into the room.
Operation—Handle on the bottom bar.

Type No. 5

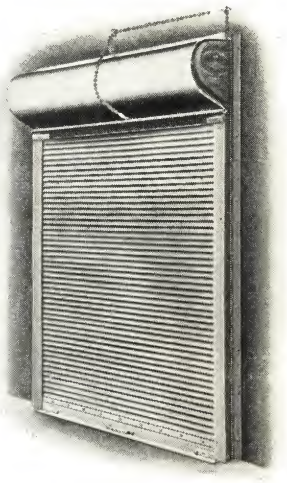
Location—Doors to be hung under the lintel in off-sets and reveals for brackets and guides as provided on detail in such way that no part of the brackets will project into the room or opening.
Operation—Handle on the bottom bar.
Optional—Guides are to be concealed by means of masonry or plaster and necessary furring.

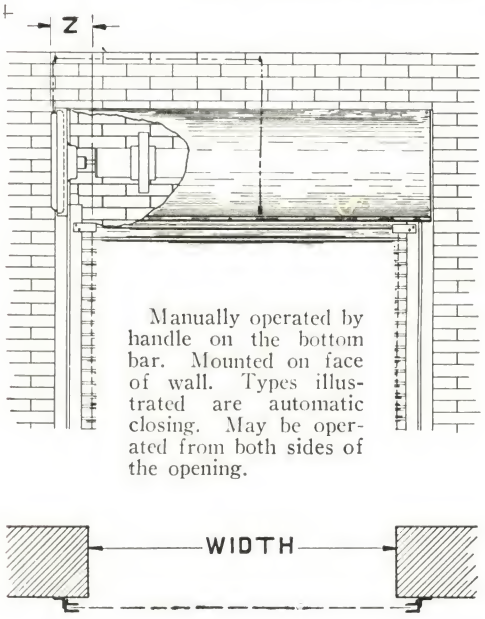
Type No. 10

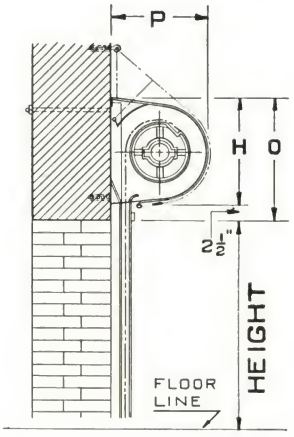
Location—Doors to be hung on face of wall; brackets and guides so placed to clear width of opening will be maintained, except where structural conditions of the building prevent.
Operation—Crank and gear.
Optional—To be operated one or both sides of wall as required.

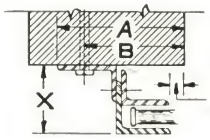
TYPES NO. 100-200-300

UNDERWRITERS' LABELED
MOUNTED FACE OF WALL—MANUAL OPERATED

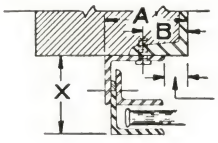








GUIDE NO
21-A
25-A
28-A
31

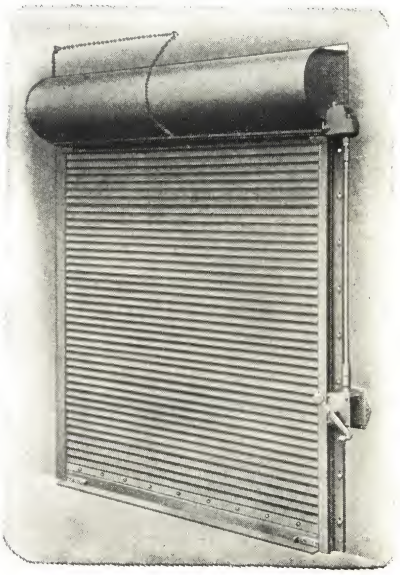


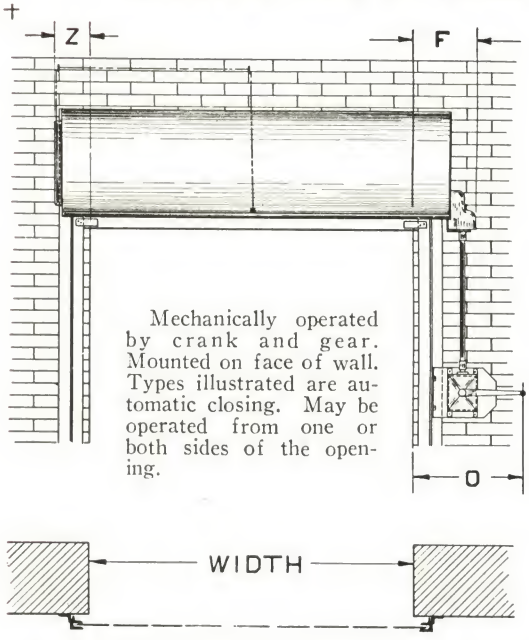
GUIDE NO
23
26
29
32

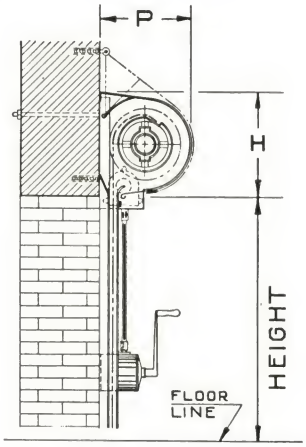
Hgt. Opg.	H	P	O	Width	Guide No.	A	B	X	Z	Guide No.	A	B	X	Z
0 to 8 ft.	16 in.	15 in.	17½ in.	0 to 6 ft.	21A	5⅜ in.	4¼ in.	2 11/16 in.	6 in.	23	2 11/16 in.	1 3/16 in.	3¼ in.	5¾ in.
8 to 10 ft.	17 in.	16 in.	18½ in.	6 to 8 ft.	25A	6⅛ in.	5 in.	3⅜ in.	6⅞ in.	26	3 7/16 in.	1 11/16 in.	3 11/16 in.	6½ in.
10 to 12 ft.	18 in.	17 in.	19½ in.	8 to 10 ft.	28A	6⅝ in.	5½ in.	3⅜ in.	7⅜ in.	29	4 in.	1¾ in.	3¾ in.	7 in.
				10 to 12 ft.	31	7⅛ in.	6 in.	3⅞ in.	7⅞ in.	32	4½ in.	2¼ in.	4¼ in.	7½ in.

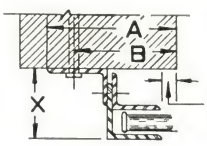
TYPES NO. 102-206-306

UNDERWRITERS' LABELED
MOUNTED FACE OF WALL—CRANK OPERATED

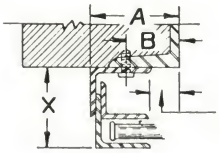








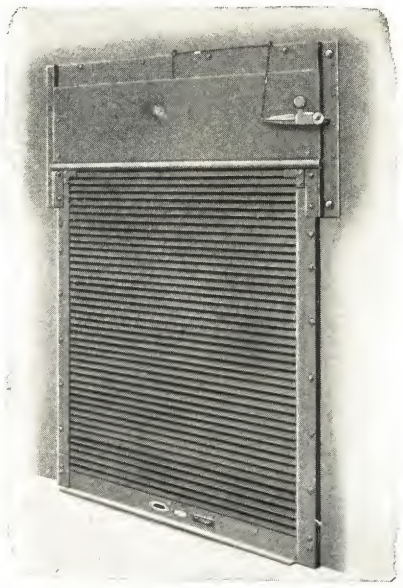
GUIDE NO
21-A
25-A
28-A
31



GUIDE NO
23
26
29
32

Hgt. Opg. ft.	H in.	P in.	Width ft.	Guide No.	A in.	B in.	X in.	F in.	Z in.	O in.	Guide No.	A in.	B in.	X in.	F in.	Z in.	O in.
0 to 8	18	15	0 to 6	21A	5⅜	4¼	2 11/16	11⅛	6	18	23	2 11/16	1 3/16	3¼	10⅝	5¾	17⅝
8 to 10	19	16	6 to 8	25A	6⅛	5	3⅜	11⅞	6⅞	18¾	26	3 7/16	1 11/16	3 11/16	11⅜	6½	18⅜
10 to 12	20	17	8 to 10	28A	6⅝	5½	3⅜	12⅜	7⅜	19¼	29	4	1¾	3¾	11⅞	7	18⅞
			10 to 12	31	7⅛	6	3⅞	12⅞	7⅞	19¾	32	4½	2¼	4¼	12⅜	7½	19⅜

TYPES NO. 104—210—310



Manually operated by handle on the bottom bar, mounted under the lintel with guides on face of the wall. Types illustrated are automatic closing. May be operated from both sides of the opening. Wall opening must be prepared for reception of this type door.

Write for complete information and details for preparation of openings.

UNDERWRITERS' LABELED DOOR SCHEDULE

Type No.	Operation	Location	Operated by
Fire Wall Doors, Class A			
100	Automatic	Face of wall	Handles
102	Automatic	Face of wall	Crank
104	Automatic	In opening*	Handles
106	Automatic	In opening*	Crank
Doors for Vertical Shaft, Corridors and Room Partitions, Class B-C			
200	Automatic	Face of wall	Handles
202	Non-automatic	Face of wall	Handles
204	Non-automatic	Face of wall	Chain
206	Automatic	Face of wall	Crank
208	Non-automatic	Face of wall	Crank
210	Automatic	In opening*	Handles
212	Non-automatic	In opening*	Handles
214	Non-automatic	In opening*	Chain
216	Automatic	In opening*	Crank
218	Non-automatic	In opening*	Crank
Doors and Shutters for Exterior Openings, Class D			
300	Automatic	Face of wall	Handles
302	Non-automatic	Face of wall	Handles
304	Non-automatic	Face of wall	Chain
306	Automatic	Face of wall	Crank
308	Non-automatic	Face of wall	Crank
310	Automatic	In opening*	Handles
312	Non-automatic	In opening*	Handles
314	Non-automatic	In opening*	Chain
316	Automatic	In opening*	Crank
318	Non-automatic	In opening*	Crank

*"In opening" refers to doors coiling under the lintel.

SPECIFICATIONS FOR UNDERWRITERS' LABELED DOORS

Openings shall be equipped with steel rolling doors of interlocking slat type as manufactured by THE MOESCHL-EDWARDS CORRUGATING COMPANY, INC., of Cincinnati, Ohio. Doors to be constructed in accordance with the following specifications:

Curtain—To be formed of interlocking slats No. 40 of galvanized copper bearing steel of gauge required by Underwriters Laboratories, Inc., approximately 1¾ in. center to center. The ends of each slat to be fitted with a malleable reinforcement to prevent lateral movement and to serve as wearing surfaces in the guides. The upper edge of curtain to be attached to the spiral rings on shaft by stove bolts, and the lower edge to bottom bar by rivets.

Hood—To be formed from 24-gauge hot galvanized sheet steel, with automatic flame stop attached.

Counterbalance—To consist of helical oil tempered steel spring enclosed within a barrel and anchored to spindle.

Operation—Handles on bottom bar or by crank and shaft, as well as well as automatic release under control of fusible link, where required.

Brackets—High grade gray iron, web not less than ⅜-in. and attached direct to guides.

Bottom Bar—To consist of steel angle of proper dimensions for reinforcing bottom of curtain.

Barrel—Steel tube with ends enclosed by cast collars fitted with ball or roller bearings, and journaled on steel shafting of suitable diameter and supported by flanges cast on or applied to brackets. Barrel shall be equipped with cast iron rings of proper diameter to maintain a correct counterbalance.

Guides—To be composed of three angles or two 3/16-in. steel plates securely riveted together to form a channel groove not less than 2 in. deep, proper depth to be determined by width of opening. All assembled according to Underwriters' requirements.

Painting—All parts to receive one shop coat of paint.

To foregoing add the following paragraphs to cover type required:

Type No. 100

Location—Doors to be hung on face of wall; brackets and guides so placed that clear height and width of openings will be maintained, except where structural conditions of the building prevent.
Operation—By handle on bottom bar.
Label—For fire wall opening.

Type No. 200

Location—See above.
Operation—See above.
Label—For vertical shaft, corridor or room partition as required.

Type No. 300

Location—See above.
Operation—See above.
Label—For exterior opening.

Type No. 102

Location—Doors to be hung on face of wall; brackets and guides so placed that clear height and width of openings will be maintained, except where structural conditions of the building prevent.
Operation—By crank and gear.
Label—For fire wall opening.

Type No. 206

Location—See above.
Operation—See above.
Label—For vertical shaft, corridor or room partition as required.

Type No. 306

Location—See above.
Operation—See above.
Label—For exterior opening.

Type No. 104

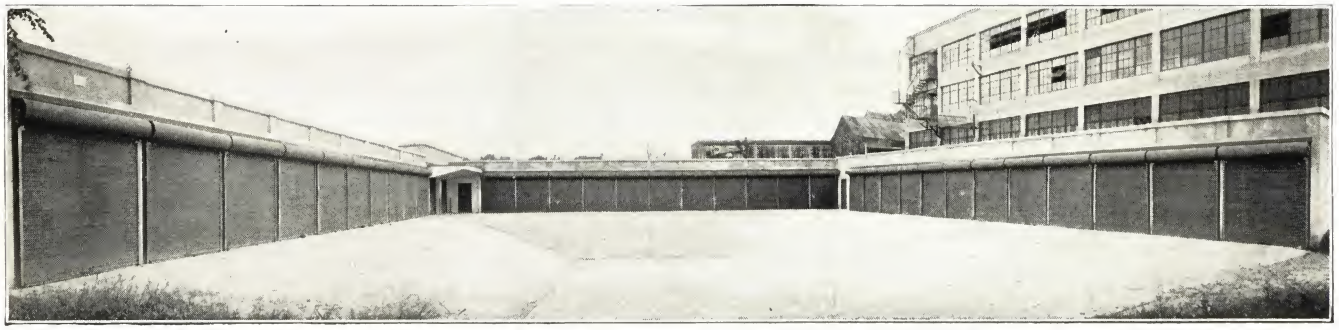
Location—Doors to be hung under lintel; brackets also to be placed under lintel. Guides to be attached to the face of the wall. All as indicated by detail.
Operation—To be by handle on bottom bar.
Label—For fire wall opening.

Type No. 210

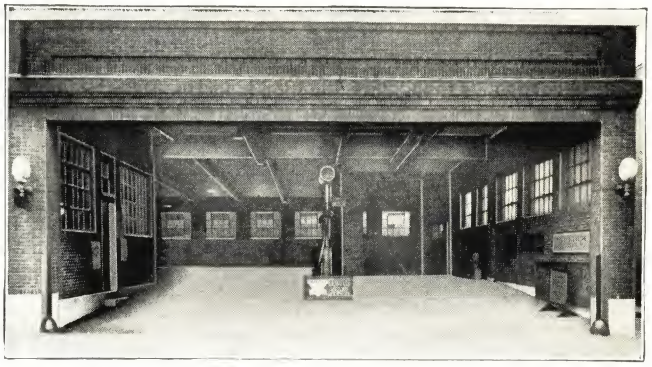
Location—See above.
Operation—See above.
Label—For vertical shaft, corridor or room partition as required.

Type No. 310

Location—See above.
Operation—See above.
Label—For exterior opening.



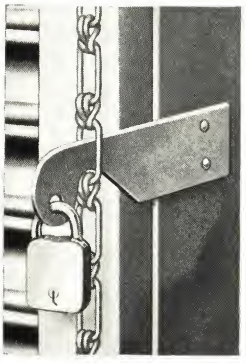
City Garage, Houston, Tex.



OPENING WITH REMOVABLE POSTS

With an installation of this kind a part or all of the opening can be made available if desired. Removable posts are provided and when all curtains are raised and posts removed the entire opening is free of all obstructions. The curtains can be made to be raised individually or as a group. Where two or more posts are used individual posts can be removed without disturbing the others. Opening and closing of an opening of this kind can be done in a surprisingly short time

Slide Bolt



Chain Lock

SLIDE BOLTS

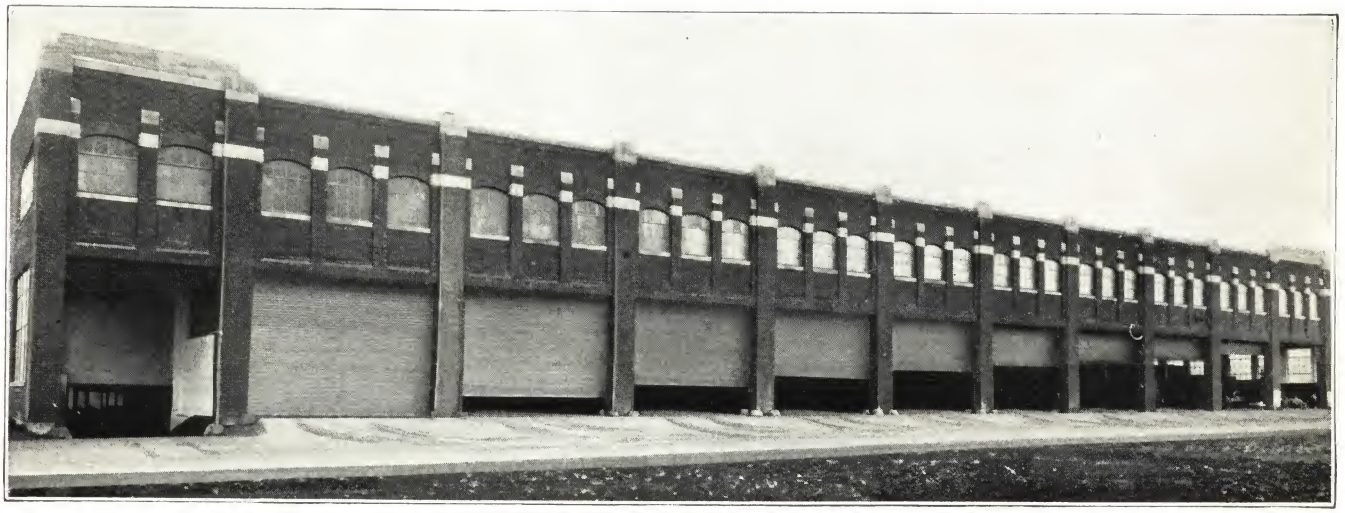
Slide bolt as illustrated is designed for locking door mounted on the inside of the building and locked from the inside of the building. Variations of this slide bolt can be supplied for locking door on either interior or exterior and where door is mounted either on the inside or outside of building. This type lock is used on either manually operated or chain operated doors. Padlocks are not included unless specified

CHAIN LOCKS

Chain locks may be used when chain is supplied for operating doors. This type lock may be used for doors mounted either interior or exterior. When used on exterior it is necessary to use a padlock. Padlocks are not furnished unless specified

WICKET DOORS

It is sometimes necessary to supply a rolling steel door with an auxiliary hinged or wicket door as illustrated. These doors may be operated without disturbing the curtain. When the entire opening is to be made available, the wicket frame is released and swung back out of the way. Wicket doors are provided with locks



F. W. Albrecht Grocery Co. Warehouse, Akron, Ohio

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CHICAGO, ILL., H. B. Dodge & Company
HOUSTON, TEX., Walcott-Maisey & Paige
LOS ANGELES, CAL., The J. G. Wilson Corporation
PHILADELPHIA, PA., The J. G. Wilson Corporation
PITTSBURGH, PA., John A. Bricker, Jr.

Products

ROLLING STEEL DOORS, WILSON STANDARD and UNDERWRITERS' LABELED; SECTIONFOLD DOORS.

For "Sectionfold" Partition, Rolling Partitions and Shutters, Rolling Front and Disappearing Door Wardrobes, and "Sectionfold" Doors Operating Overhead, see Products' Index.

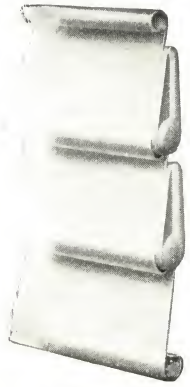
TRADE-MARK

Wilson Steel Rolling Doors

Wilson Steel Rolling Doors have been proving for over fifty-three years that they are properly designed and constructed to give the longest service at a minimum operating expense.

The curtain proper is composed of interlocking corrugated galvanized steel slats, equipped with malleable iron end locks. The curtain is fastened to malleable iron barrels connected to wrought iron pipe and travels in steel guides.

"Big 4" Interlocking Slat



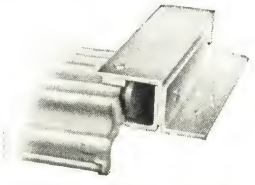
No. 2 Interlocking Slat with Fire Stops

Features of Construction

Interlocking Slats — They have a distinct advantage in that, being of corrugated form, they have far greater rigidity than ordinary channel formed slats.

The curtains of the Underwriter type are equipped with fire stops on the ends of slats, baffle plates in the hood, and (when desired) automatic devices which cause them to close in case of fire.

Safety Groove and Wind Lock—An exclusive feature of Wilson doors. It is considered standard equipment for all doors over 14 ft. in width. Doors so equipped cannot possibly be blown from the grooves. The curtain will stand any conceivable wind pressure without excessive deflection. Wind pressure necessary to overcome the resistance of the Wilson Safety Lock in an 18-ft. span is 1000 lb.; 24-ft. span, 500 lb.; 30-ft. span, 300 lb. Wind velocity of 120 miles has a pressure of only 43 lb. per sq. ft.



Safety Groove and Wind Lock

Spring Tensioning Device—This, as furnished on Wilson doors where called for, permits of extremely accurate adjustment in counterbalancing the curtain. It is composed of a worm and wheel in very compact enclosed form, assuring proper counterbalance. No pins or locks are used. It is self-sustaining and can be easily operated.

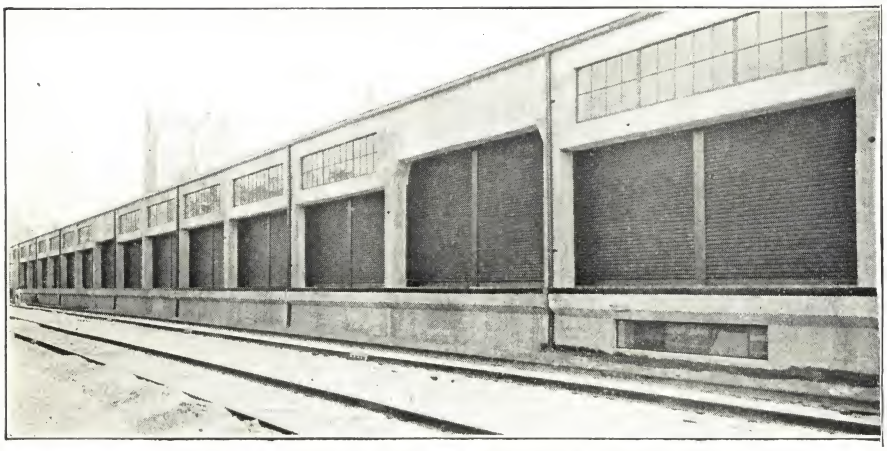
Operation of Wilson Non-labeled Rolling Steel Doors

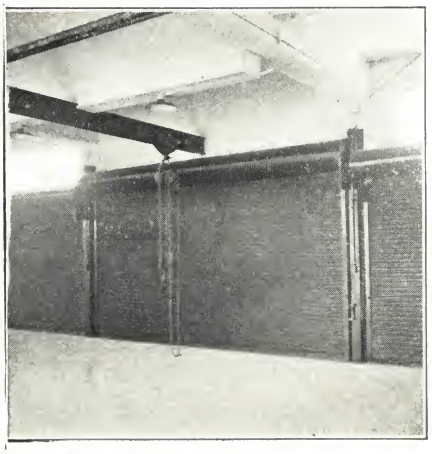
Wilson rolling steel doors may be operated from either one or both sides of opening.

Small doors are usually raised and lowered by handles on bottom bar, and large doors are usually operated by chain gear, crank gear or electrically.

Self-coiling Operation — Wilson Types S. C. 11 and 22 are operated by hand by means of handles on bottom bar of door. This type is not recommended on openings over 10 ft. wide or more than 8 ft. in height, or exceeding 80 sq. ft.

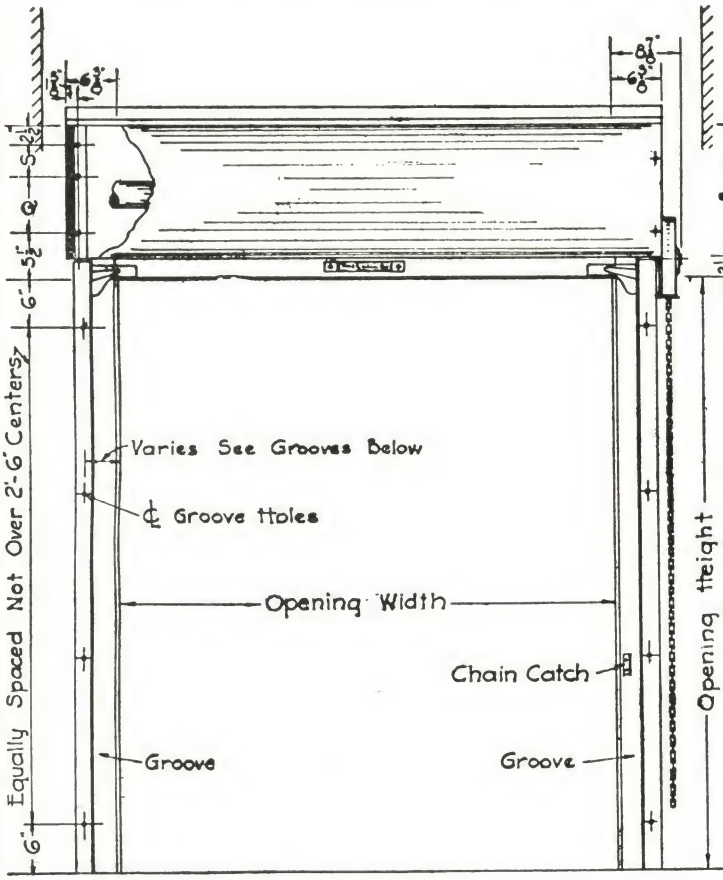
Chain or Crank Operation—Should be used for doors larger than limitations of self-coiling operation. Wilson Types C. G. 11 and 22 are operated by means of chain and gear. Wilson Type K. G. 11 is operated by crank gear. The chain operated door has been universally adopted as the standard service door.



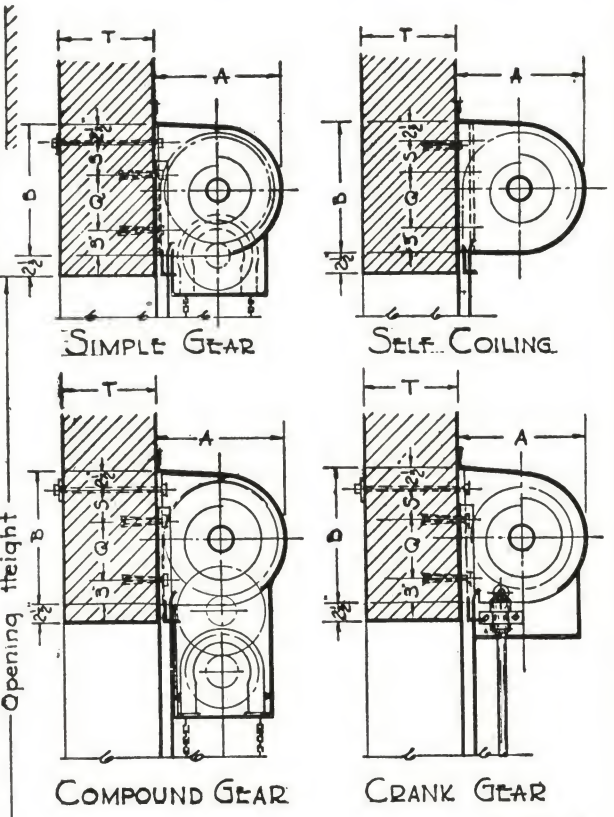


Exterior and Interior Views of Outbound Freight Depot, Santa Fe Railroad Co., Dallas, Texas
ROBERT E. MCKEE, Contractor

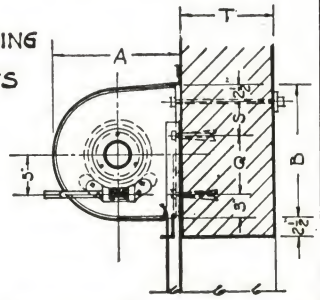
COMMERCIAL ROLLING STEEL DOORS



ELEVATION
SCALE: 1/2"-1'-0"

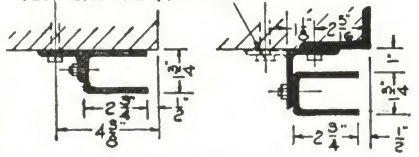


SECTIONS SHOWING GEARED BRACKETS
SCALE: 1/2"-1'-0"



SECTION SHOWING SPRING TENSIONING DEVICE
SCALE: 1/2"-1'-0"

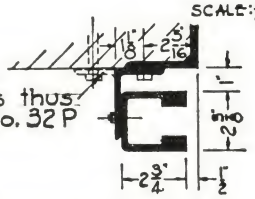
Angle Turns Thus for Groove No. 40 P



GROOVE No. 40A GROOVE No. 40N
SCALE: 1 1/2"-1'-0"

These Grooves to be used when Opening width is less than 14'-0" and Opening Heighth is less than 16'-0"

Angle turns thus for Groove No. 32 P



GROOVE No. 32 N.
SCALE: 1 1/2"-1'-0"

These Grooves to be used when Opening width is over 14'-0" and Opening Heighth is over 16'-0"

CLEARANCE SCHEDULE FOR COMMERCIAL ROLLING STEEL DOORS.

CHAIN OR CRANK OPERATED-BIG 4 SLAT					SELF COILING LITTLE 4 SLAT					SELF COILING No. 2 JR SLAT				
OPENING HEIGHT FT. IN. FT. IN.	A IN.	B IN.	Q IN.	S IN.	OPENING HEIGHT FT. IN. FT IN.	A IN.	B IN.	Q IN.	S IN.	OPENING HEIGHT FT. IN. FT IN.	A IN.	B IN.	Q IN.	S IN
7-0"	15	15 1/2	7	3	3-9	12	12 1/2	4	3	6-6	11	11 1/2	3	3
7-1 To 9-11	16	16 1/2	8	3	3-10 To 4-8	13	13 1/2	5	3	6-7 To 7-4	13	13 1/2	5	3
10-0 To 11-4	17	17 1/2	8	4	4-9 To 7-1	14	14 1/2	6	3	7-5 To 8-1	14	14 1/2	6	3
11-5 To 14-2	19	19 1/2	10	4	7-2 To 10-0	15	15 1/2	6	4	8-2 To 10-5	15	15 1/2	6	4
14-3 To 15-1	20	20 1/2	11	4										
15-2 To 17-0	21	21 1/2	11	5										
17-1 To 18-5	22	22 1/2	12	5										
18-6 To 20-10	23	23 1/2	13	5										

Notes - The above schedule of dimensions and clearances to be used in conjunction with details at top of page.
In addition to applications shown above, doors may be applied to one side of the wall and operated from the other.

DETAILS FOR LABELED DOORS AND FIRE WALLS

Wilson Rolling Steel Fire Doors (Underwriters' Labeled)

Are exceptionally durable and equipped with special fire protective devices. Close automatically in case of fire, and are approved and labeled by the Underwriters' Laboratories, Inc., for the following services:

Vertical Shafts, Corridors and Room Partitions—Area of opening not to exceed 80 sq. ft.; neither width nor height of opening to exceed 12 ft. Curtains may be hung on face of wall or between jambs, self-coiling or crank operation, and where required are automatic closing in case of fire. Specify Wilson Type Nos. 21 to 26, inclusive, interlocking slat No. 2, No. 20 gauge.

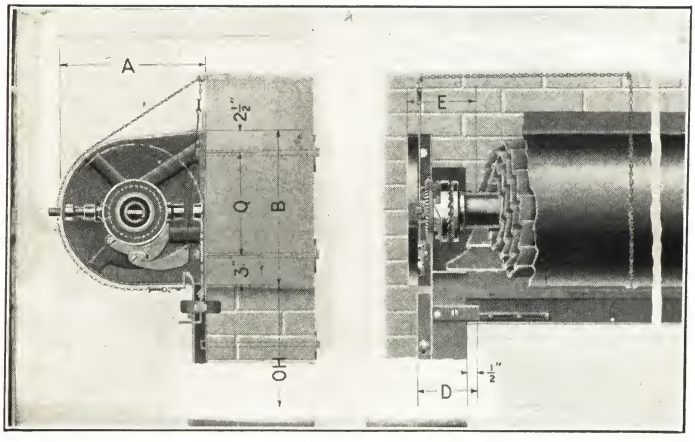
Fire Walls—Area of opening not to exceed 80 sq. ft.; neither width nor height of opening to exceed 12 ft. Two doors are required, and may be hung on face of wall or between jambs, self-coiling or crank operation, and close automatically in case of fire. Specify Wilson Type Nos. 31 to 35, inclusive. interlocking slat No. 2, No. 20 gauge.

Exterior Walls—Area of opening not to exceed 100 sq. ft.; neither width nor height of opening to exceed 12 ft. Curtain may be hung on face of wall or between jambs, self-coiling, chain or crank operation, and, when desired, may be automatic closing in case of fire. Specify Wilson Type Nos. 41 to 51, inclusive, interlocking slat "Little 4," No. 22 gauge.

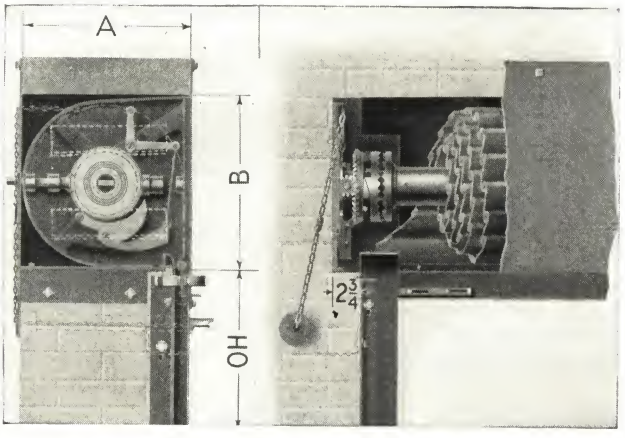
Automatic Closing Device—Where required, doors close automatically by the fusing of one of two links located at the head or side of opening, and near the ceiling.

Doors close easily on the sill and can be raised immediately after without difficulty. Automatic device can be reset and new link inserted without removing the hood or dismantling the door.

Grooves and bottom bar of door are provided with slotted holes to allow for expansion. Special fusible galvanizing is applied to grooves, allowing freedom of movement during expansion. Bolts for brackets and grooves are bolted through wall or attached to iron inserts furnished and installed by others.



DOOR APPLIED TO FACE OF WALL



DOOR APPLIED BETWEEN JAMBS

CLEARANCE SCHEDULE FOR UNDERWRITER LABELED ROLLING STEEL DOORS

CLASS A, B & C DOORS — No. 2 SLAT & FIRE STOPS			
OPENING HEIGHT FT. IN. — FT. IN.	A IN.	B IN.	Q IN.
4-10	14	14½	9
4-11 To 6-5	15	15½	10
6-6 To 8-0	16	16½	11
8-1 To 9-9	18	18½	13
9-10 To 12-0	19	19½	14
E Opening Width under 8'-0" equals 6" Opening Width over 8'-0" equals 7"			
D Opening Width under 8'-0" equals 5½" Opening Width over 8'-0" equals 6½"			

CLASS D DOORS — LITTLE 4 SLAT AND FIRE STOPS			
OPENING HEIGHT FT. IN. — FT. IN.	A IN.	B IN.	Q IN.
4-10	14	14½	9
4-11 To 6-5	15	15½	10
6-6 To 8-0	16	16½	11
8-1 To 8-7	17	17½	12
8-8 To 10-8	18	18½	13
10-9 To 12-0	19	19½	14
E Opening Width under 10'-0" equals 6" Opening Width over 10'-0" equals 7"			
D Opening Width under 10'-0" equals 5½" Opening Width over 10'-0" equals 6½"			

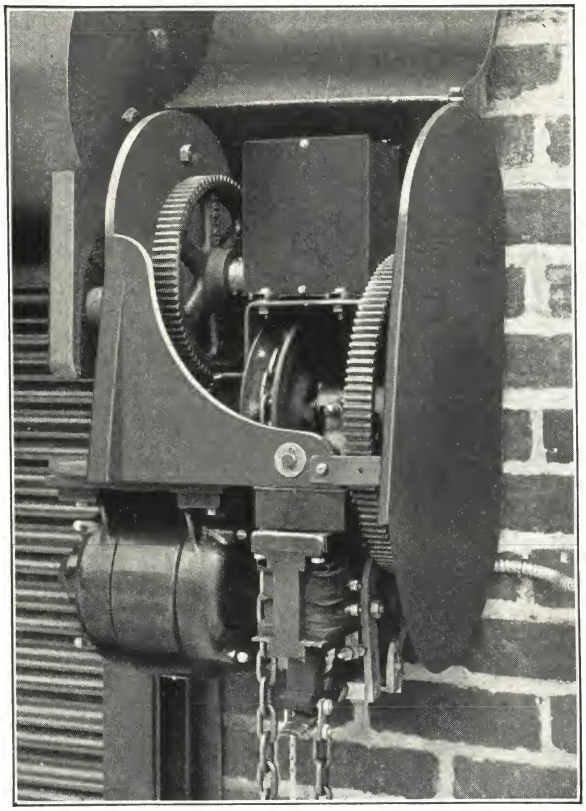
WILSON POWER UNITS

Wilson Power Units are all designed in as simple, compact, and reliable electric units as is possible to meet the existing conditions of the building, and to fulfill the requirements of each individual size door for which they are to be used.

If the designs shown on this page are not feasible, kindly submit your sketches and our Engineering Department will gladly furnish recommendations as to the proper type of installation.

The No. 7 Unit is designed to operate small steel rolling doors—the motor size varying from ½ to ¾ hp. It is equipped with machine cut gears, also a high speed machine cut fiber gear on the motor shaft to minimize the amount of noise.

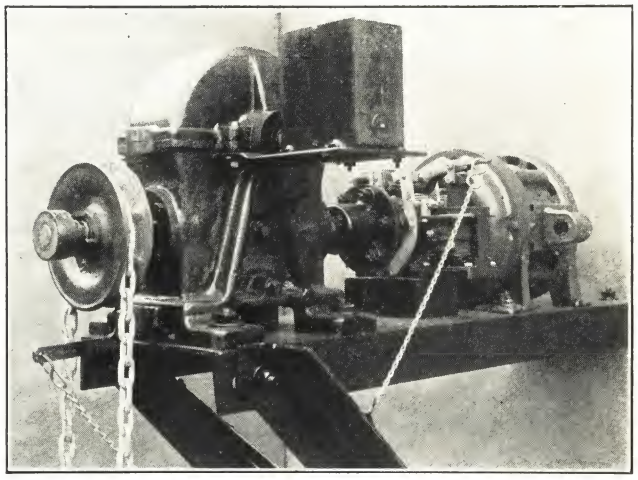
The No. 4 and the No. 5 Units are designed to operate the larger steel rolling doors—both being equipped with bronze worm wheel and steel worm running in an oil bath, a silent roller chain transmitting the power from



Wilson No. 7 Unit for Small Steel Rolling Doors

the unit to the door shaft. This flexible means of adjustment is recommended on all large units.

The No. 8 Unit is used to operate Sectionfold Doors, of wood construction, that are now being used in the overhead door field for fulfilling the present need in both private and public garages and commercial buildings. There should be allowed at least 21-in. headroom and approximately 12-in. side room for mounting this unit.



Wilson No. 4 and 5 Unit for Large Steel Rolling Doors

It is equipped with either ¼ or ½ hp. motor, depending upon the size of the door to be operated.

Control

All units controlled through push button stations connected with a magnetic switch.

The motor is automatically cut off when the door is either fully opened or closed by a positive acting limit switch.

The large units are all equipped with solenoid brakes which automatically set when the current is cut off.

A Thermo overload relay mounted in the magnetic switch protects the electrical equipment against overload in the current.

Emergency Hand Operation

All units are equipped with hand emergency operation. A clutch is built into the emergency wheel, and operates by a small hand chain. By engaging the clutch a contact is formed between the emergency wheel and the unit proper.

Wilson No. 8 Unit for Sectionfold Door Operating Overhead

ALLEN-DREW COMPANY

DIVISION OF BABCOCK-DAVIS CORPORATION

474 Dorchester Avenue
BOSTON, MASS.

For Our Other Pages, see Manufacturers' Index

Specialists in the Motor Operation of Doors, Windows, Walls and Other Engineering Problems of a Similar Nature

Allen-Drew Engineering Service

Our Engineering Department is at the service at all times of those who desire estimates, preliminary layouts and specifications where the motor operation of doors, gates, windows, and other work of this nature are involved.

We also operate as consultants on major operations involving the moving by electricity of large sections involving soundproof, fireproof or other special features of similar nature, and we are prepared to compile complete calculations, specifications, detailed plans, and other engineering work necessary.

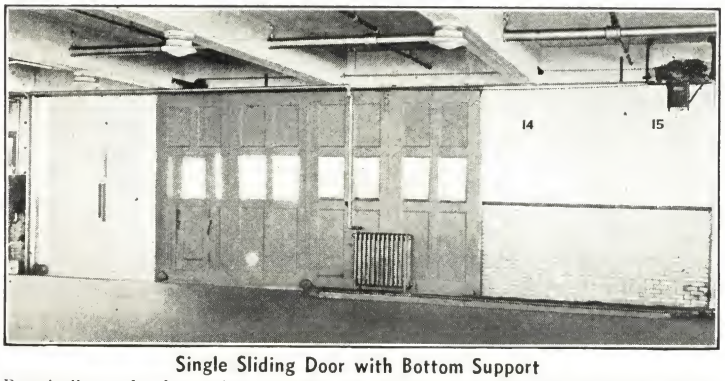
It is essential that we be advised of a project in its early stages as our work involves problems in electrical control, structural framing, mechanics, acoustics, and fireproof construction which make it absolutely essential that each detail be incorporated in such a way as to co-ordinate the balance of the construction.

Standard Range of Motor Operated Equipment

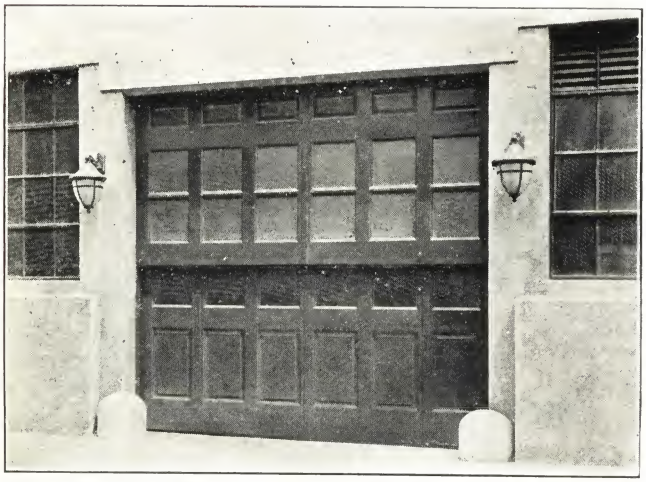
We have electric-drive equipment for parts of buildings of any size.

We operate doors for openings 100 ft. wide and 25 ft. high, representing a total weight of 30 tons in some cases.

We have walls covering openings 128 ft. wide by 42 ft. high weighing up to 50 tons; floors covering 6400 sq. ft. weighing up to 120 tons; ceilings up to 5000 sq. ft. in area weighing 30 tons; and other parts of buildings of other nature.



Single Sliding Door with Bottom Support
Practically no headroom is necessary as operating chains run through the girders



Glazed Two-piece, Two-speed Vertical Lift Doors in the Garage of the Malden Electric Co., Malden, Mass.

Four-piece Swinging and Folding Doors

AUTOMATIC DOOR & EQUIPMENT COMPANY

(INCORPORATED)

Exclusive Designers, Manufacturers, Builders and Installers

GENERAL OFFICES AND FACTORY
360-62 East Grand Avenue, CHICAGO, ILL.
TELEPHONES SUPERIOR 5154, 5155
EASTERN OFFICE, 56 West 45th Street, NEW YORK, N. Y. BRANCH OFFICES IN ALL PRINCIPAL CITIES

Products

ELECTRIC DOOR OPERATORS (for all types of doors). SPECIAL OPERATORS (for moving walls and special uses).

ACCESSORIES: Time Closing Devices, Floor Trip Switches, Photo Electric Switches.

HEAVY DUTY HARDWARE—Malleable and Ball Bearing —for all types of doors; SPECIAL HARDWARE for Special Uses; WOOD, METAL and METAL COVERED DOORS; RAILWAY DRAW BRIDGES; ELECTRIC OPERATORS for Inside Swing Doors.

All our products are designed and built to work with other products of standard design.

GENERAL BUILDING USES AND TYPE OF DOOR APPLICATIONS

For use in	Folding and swinging doors	Slide doors and gates	Lift doors	Pier doors	Drawbridge	Moving store fronts	Moving walls	Pedestrian, small swing doors	Heavy platform	Jack-knife doors
Police stations	X	X								
Fire houses	X	X								
Garages	X	X	X							
Banks		X	X				X	X		
Railroads	X	X	X	X	X					X
School buildings			X				X		X	
Pier sheds	X	X		X	X					X
Prisons		X					X	X		
Powerhouses	X	X	X	X	X					X
Industrial plants	X	X	X	X	X				X	X
Apartment buildings	X	X					X	X		
Retail stores						X		X		
Warehouses	X	X	X	X	X		X			X
Hospitals	X	X						X		
Auditoriums	X	X	X				X		X	
Airport hangars		X	X		X					

Services and Estimates

We render "A Complete Service" to architects, engineers and builders. Our Draughting and Estimating Departments are at your service. Estimates, suggestions, specifications and plans will be furnished upon request and at no charge.

Bulletins

Write for special bulletins which cover all of our products. These bulletins give complete and specific information for every kind of Operators, Hardware, Doors, Frames and Accessories which we design, build and install.

A Few of the Many Well Known ADECO Installations

INSTALLATION	ARCHITECT	TYPE OF ENTRANCE
Chicago Stadium, Chicago, Ill.	Hall, Lawrence & Ratcliffe	Fold Doors
Swift and Company, Chicago, Ill.	Swift & Company	Swing Doors
New York Fire Departments	John R. Sliney	Slide Doors
Chicago Fire Departments	Paul F. Gerhardt, Jr.	Fold Doors
Ford Motor Company, Detroit, Mich.	Ford Motor Company	Slide Doors
Daily News Building, Chicago, Ill.	Holabird & Root	Fold Doors
General Motors Co., Detroit, Mich.	Albert B. Kahn, Inc.	Fold Doors
New York Central R. R., New York, N.Y.	New York Central R. R.	Pier Doors
Chicago, Milwaukee, St. Paul & Pacific Ry. Fruit Terminal, Milwaukee, Wis.	C. M. St. P. & Pacific Ry.	Roller Doors, Operated
Public Safety Building, Milwaukee, Wis.	A. L. Ross	Slide Doors
Brooklyn Ramp Garages, Brooklyn, N.Y.	John B. Peterkin	32-ft. Fold Doors
Sinclair Refining Co., Chicago, Ill.	Sinclair Refining Co.	Slide Doors
Medinah Athletic Club, Chicago, Ill.	Walter W. Alschlager	Fold Doors
R. H. Macy & Company, New York, N.Y.	Kohn, Holden & Knight	Fold Doors
Paramount Studios, Astoria, N. Y.	C. Hamilton	Fold Doors
Post Office Garage, Baltimore, Md.	James A. Wetmore	Fold Doors
Post Office, Boston, Mass.	James A. Wetmore	Slide Doors
Riker's Island Prison, New York, N. Y.	Sloan & Robertson	Lift Walls and Interlock Gates
Caterpillar Tractor Co., Minneapolis, Minn.	Austin Company	Drawbridge

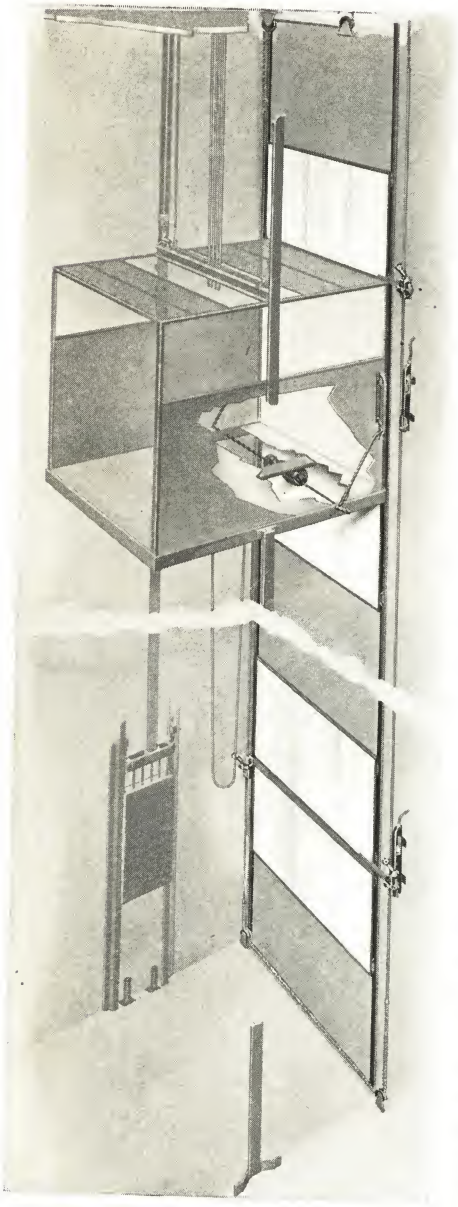
And in many other buildings of similar note

Carew Towers, Cincinnati, Ohio
One of the many typical fine building installations in which ADECO Products were specified
WALTER W. ALSCHLAGER, Architect

QUINCY ELEVATOR GATE COMPANY

Manufacturers of Power Operators for Freight Elevator Doors and Gates

TIFFIN, OHIO



Friction Grip Operator, "Penthouse Type"

Operation

The annunciator informs the elevator operator of the stop to be made. When reaching the floor he releases his elevator control switch handle and the doors open automatically. Three-Button Station on car marked "Open," "Close" and "Stop" gives complete control of doors at all times.

The Combination Lock and Interlock on each door is mechanically operated and positively prevents operation of the elevator when any door is open or unlocked.

Description of Penthouse Type Operator

The power unit includes standard make motor, worm gear reducer with Timken roller bearings, solenoid brake, and push button control. Built-in slow-start and slow-stop mechanism is simple and rugged, and is permanently set at time of installation.

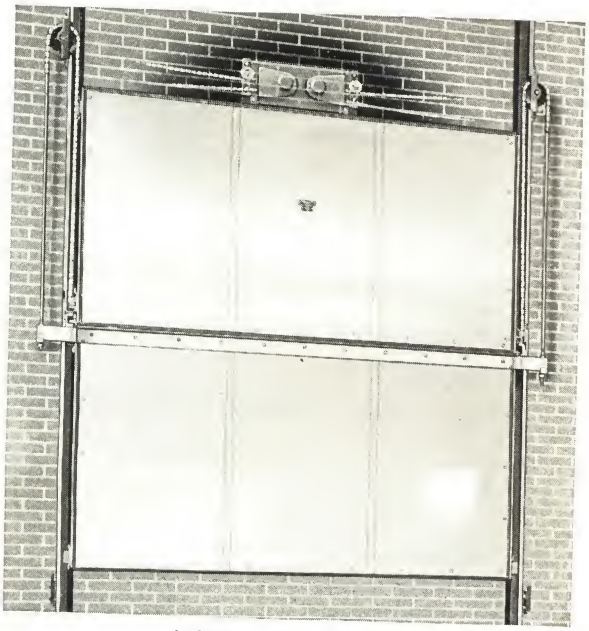
The Quincy Friction Grip has two round rods (one at each end of the door), connected to chains which pass over sprockets in the penthouse. These rods operate through Friction Blocks attached to each side of the door by means of flat brackets.

A Friction Block can only engage with a vertical rod when the car is at its landing and the retiring cam operates; thus the vertical rods slip through the open Friction Blocks on the other doors.

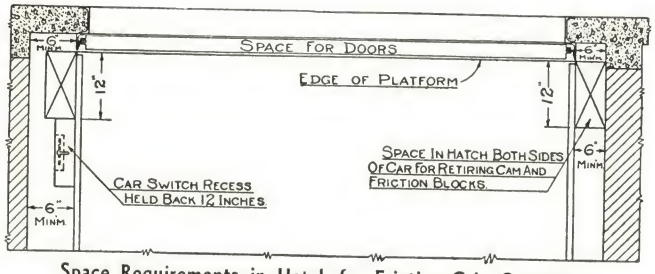
Description of Individual Operator

The power unit includes a slow speed torque motor, spur gear reduction, roller chain drive, and patented slow-down mechanism.

Shafts through the wall operate the doors, all of which are controlled by a master panel in the penthouse. A zone switch at each landing selects the door to be operated. Doors can be manually operated at all times and are perfectly cushioned so they cannot slam.

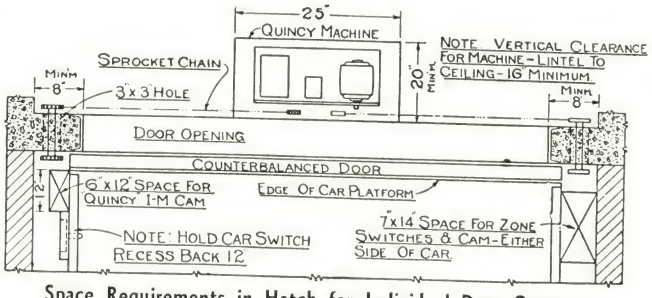


Individual Door Operator



Space Requirements in Hatch for Friction Grip Operator, "Penthouse Type"

When the elevator has a line of doors at the rear, it is necessary to provide the same size spaces as shown for front of car



Space Requirements in Hatch for Individual Door Operator

When the elevator has a line of doors at the rear, it is necessary to provide the same size spaces as shown for front of door